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Evaluation of FAO's Contribution to the
Republic of Kenya

CASE STUDY

May 2018

COUNTRY PROGRAMME EVALUATION SERIES

Evaluation of FAO's Contribution to the Republic of Kenya

**CASE STUDY. PROJECT: INCREASED PRODUCTIVITY AND PROFITABILITY OF
SMALLHOLDER FARMERS THROUGH PROMOTION AND UPSCALING OF GOOD
AGRICULTURE PRACTICES (GAP) AND CONSERVATION AGRICULTURE (CA) IN
PRODUCTIVE SEMI-ARID AREAS OF KENYA (IPP-GAP)
GCP/KEN/079/EC**

**A JOINT EVALUATION BY THE
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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May 2018**

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1. Introduction

1. The Office of Evaluation (OED) of the Food and Agriculture Organization of the United Nations (FAO), in partnership with the Kenya Institute for Public Policy Research and Analysis (KIPPRA) and Tegemeo Institute of Agricultural Policy and Development conducted an evaluation of FAO's Country Programme (2013-2016) in the Republic of Kenya in the period May-July 2017. As defined in the Terms of Reference (ToR) of the Country Programme Evaluation (CPE), the purpose of the exercise is to *provide feedback to better orient FAO's programme with a view to make future FAO CPF's more impactful and relevant to the needs of the country*. The CPE should contribute to learning at corporate, regional and country level, draw lessons and make useful recommendations for FAO's future engagement in the country.
2. The ToR of the evaluation were prepared in an inception phase and define the methodology proposed for the CPE which includes, among several other qualitative and quantitative methods for information gathering and analysis,¹ the development of a case study on the project *Increased productivity and profitability of small holder farmers through promotion and up-scaling of Good Agriculture Practices (GAP) and Conservation Agriculture (CA) in productive Semi-Arid Areas of Kenya (IPP-GAP) – GCP/KEN/079/EC*. This project has been chosen for the implementation of a specific case study due to its relevance in the Country Programming Framework (CPF) in terms of objectives and budget. In particular, it is the main project contributing to the second outcome of the CPF.²
3. The objective of the IPP-GAP case study is to contribute to the evaluation of Outcome 2 of FAO's CPF in Kenya, and more specifically to describe and analyse positive outcomes and benefits in the life of beneficiaries, and the factors that have contributed to these outcomes or affected the success of the actions.
4. The case study is not representative of the whole IPP-GAP, but focused on a reduced number of counties and beneficiary groups and households, developing in-depth analysis of the outcomes and changes in their lives that could be attributed to the project or to which the project had contributed.
5. The scope of the study is therefore limited to two counties and six farmer groups, including two unsuccessful farmer groups in order to allow for comparison with successful farmer groups. The time scope is from the beginning of the implementation of the IPP-GAP activities with the selected groups to date.

1.1 Methodology

6. In order to achieve the overall and specific objectives of the case study, a list of evaluation questions was developed and integrated into a matrix (see Annex 1), based on the overall CPE matrix, that defines sub-questions, indicators, source of information and data collection methods for each evaluation question. Questions are structured in the matrix following the applied criteria of relevance, coherence, effectiveness, impact and sustainability.

¹ Document reviews, key informant interviews, focus group discussion, observation (site visits), case study, household survey, online questionnaire.

² *Agricultural productivity and production of medium and small-scale producers increased, diversified and aligned to markets.*

7. As mentioned before, the study has a limited geographic scope of two counties that were selected based on several criteria in order to identify two where project implementation was most mature (see Annex 2). This resulted in Makueni and Tharaka Nithi counties being selected.
8. Considering the time available for field visits, six farmer groups were selected to carry for the case study, three in each county, composed of two successful groups and one less successful group.³ Successful groups were chosen from a list of 60 farmer groups that were appraised by FAO to be commercially viable, and selected for future capacity strengthening activities and that have signed trading contracts and supplied satisfactorily the production planned in the contacts. Less successful groups participated in all the planned capacity building activities implemented by the IPP-GAP but have not managed to sign a trading contract. Groups were selected by FAO Country Office, in agreement with the respective county authorities and validated by the consultant in charge of the case study.
9. A list of stakeholders based in Nairobi and the two selected counties involved directly or indirectly in the project was used to identify participants in the case study. (see Annex 3). Semi-structured interviews were conducted, individually or in focus groups. Separate focus groups were held for men and women, and individually with some male and female farmers in order to further analyse some key aspects. Twenty-one individual farmer interviews were carried out. The other methods used for gathering and analysing information were the review of available literature and direct observation. In addition, some quantitative data collected in a survey carried out for the purpose of the whole CPE have been used.
10. During June 2017, quantitative data was collected at household level in both Makueni and Kitui counties. The main purpose of the household field survey (HH) was to compare several indicators – regarding conservation agriculture, resilience and other aspects – among FAO's beneficiaries and non-beneficiaries which were previously interviewed in July/August 2015.⁴
11. In order to provide support to the qualitative survey carried out in Makueni, the HH survey data presented in this report is exclusively from the beneficiaries from the GCP/KEN/079/EC project in that county. Thus, the following estimates correspond to a total of 295 households - 222 beneficiary households and 73 households that were not benefited by any programme between 2014 and 2017. It is worth mentioning that this specific sample is not representative for the Makueni County – since it is a part of the sampled HH for Kitui and Makueni counties.

³ Makueni successful groups: Kavuthu farmer group and Kitengei Commercial Village. Makueni less successful group: Ngokolani farmer group. Tharaka Nithi successful groups: Tharaka Poultry Self Help group and Mutethie Self Help group. Tharaka Nithi less successful group: Arise and Shine Self Help Group.

⁴ The sample selection was done in 2014 and was based on a multi-stage, cluster random sampling. The first stage was clustering the sub counties where critical mass of FAO interventions was taking place or planned to be implemented. Random selection of sampled households from the sub counties using Probability Proportional to Size (PPS) was utilized in order to reduce bias. 'Treatment' groups were sampled randomly from the FAO beneficiary lists while 'control' groups were sampled from the community using a systematic random cluster sampling method. The sampling precision used for the total sample was 3 percent.

2. The IPP-GAP

12. The IPP-GAP has a duration of 48 months and covers the period from mid-2014 to mid-2018. It contributes to FAO's Strategic Objective 2 (Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner) and to Outcomes 1⁵ and 2 of the FAO CPF for Kenya.
13. The project aims at *contributing to improving the livelihoods of rural farming populations in semi-arid Kenya by increasing their incomes, making them more resilient to climate shocks and reducing their vulnerability to poverty and food deficits*. The project is based on two main approaches: i) the promotion of conservation agriculture (CA) and good agricultural practices (GAP); and ii) the creation of improved market linkages and opportunities, which should contribute to increase the graduation of small-scale farmers so that they engage on commercial-oriented farming.
14. The main activities planned in the project are:
 - Implementation of a large extension programme on CA and GAP in order to improve the knowledge and capacities of farmers, based on a cascade training from Masters of Trainers (MoT), Trainers of Farmers (ToF) to farmers, and on a farmer field school approach.
 - Development of an e-agriculture platform.
 - Support institutionalization of CA and GAP support capacity of government, private sector and NGO extension workers.
 - Support the creation of new market linkages and modalities (collective contracts) between farmer groups and final buyers.
15. The project targets 80 000 direct beneficiaries in eight counties (Machakos, Makueni, Kitui, Tharaka Nithi, Laikipia, Meru, Kwale and Kilifi). Thirty percent of target beneficiaries should be women.
16. It has a total budget of EUER 9.5 million and is supported by the European Union.
17. The main partners of FAO for the implementation of the IPP-GAP are county authorities. Private extension services are also involved in the extension programme.

⁵ *Agricultural-based livelihoods are supported by an enabling policy and investment environment.*

3. Findings

3.1.1 Part A: Strategic positioning

3.1.1 Alignment with national and county policies and priorities

18. The IPP-GAP is aligned with the main national agriculture policy, the Agricultural Sector Development Strategy (ASDS) 2010-2020 through two aspects:
 - The ASDS clearly puts the emphasis on commercial agriculture: its mission is defined as an *Innovative, commercially oriented and modern agriculture*, and one of its two strategic thrusts is *increasing productivity, commercialization and competitiveness of agriculture commodities and enterprises*. One of the five interventions proposed for the crops and land development sub-sector is *improving agribusiness and market access*.
 - The ASDS includes the development of arid and semi-arid lands (ASALs) as one of the main priorities, in particular as a strategy to strengthening food security in the country. However, while GAPs are mentioned for these areas, such as the development of drought tolerant crops and the correct use of fertilizers and manure, CA is not mentioned. In addition, for ASALs, the emphasis is put on livestock development and irrigated agriculture.
19. At county level, interviews with county agriculture authorities showed the project is clearly aligned with their priorities.
20. In Makueni, agriculture is the third priority of the Government in terms of resources invested, behind health and water. On agriculture, the priority is to increase production, productivity and profitability for farmers, through improved value chains that include grains, strengthen environmental conservation and resilience using CA and GAP.
21. In Tharaka Nithi, for lower zones that are part of ASALs, the priority is to support adaptation to climate variability and strengthen resilience and food security through improved cereals, legumes and horticulture value chains.
22. Interviews with agriculture county authorities also showed that CA is in process of being "institutionalized" in the two counties. Makueni County has not yet prepared a policy that includes CA explicitly, however, the county has invested in three tractors with CA equipment, which shows county authorities are determined to support the development of CA in the long-term. In Tharaka Nithi, an agriculture development policy that explicitly integrates CA has been elaborated and approved by the county assembly and is pending to be approved by the governor. According to agriculture authorities, resources have been budgeted to continue supporting CA through extension services.

3.1.2 Appropriateness to the devolution process

23. Interviews with FAO County Project Officers and county authorities in the two counties included in the case study showed FAO's set-up at county level and the project approach is appropriate to supporting the devolution process.
24. FAO's field offices and County Project Officers allow FAO to be very well positioned at county level, being a strategic and trustworthy partner of county authorities that consider FAO's in-county presence a major advantage compared to other development institutions. This set-

up allows FAO to participate closely and influence technical and policy dialogue related to agriculture at county level. The ongoing institutional adoption of CA is a result of this proximity.

25. The IPP-GAP is presented by FAO to be the first project directly implemented by FAO, as compared to past practice of partnering with non-governmental organizations (NGOs) that played an intermediary role between FAO and county stakeholders. In reality, the project is implemented in partnership with county agriculture authorities and relies partly on public extension services for the implementation of the farmer groups training programme on CA and agribusiness. FAO also worked with private extension services, mainly members of farmer groups and community-based organizations (CBOs) due to the limited number of available public extension workers given the targeted coverage foreseen by the project. This partnership included a vast training programme of extension services, which is seen by agriculture county authorities as a major contribution to the devolution process.

3.1.3 Partnership and coordination

26. As mentioned earlier, the direct partnership between FAO and county agriculture authorities for the implementation of the IPP-GAP is relevant to the objective of supporting the devolution process. It places FAO in a strategic position and fosters a close relationship with county authorities; allows for building capacities of county agriculture authorities and extensions services on specific issues that are part of county priorities, such as value chains, CA and GAP.
27. However, both FAO and county authorities have mentioned some challenges within this partnership. These are mainly due to the bureaucracy on both sides, which have occasionally delayed some activities, and the reluctance of county authorities to replace some extension workers that underperformed in their duties related to the project. In the case of FAO, bureaucracy is related to administrative process, particularly to the timely payment of extension workers and procurement of inputs.

3.1.4 Cross-cutting issues

28. The initial design of the IPP-GAP, as seen in the project document, only considers gender equality and women empowerment through the targeting of 30 percent of women as part of the direct farmer beneficiaries. In project implementation, this target has been exceeded.⁶ However, farmer group visits and interviews with county authorities showed this was not the result of a designed, proactive approach by FAO to promote women's participation, but due to the simple fact that women are usually more represented than men in farmer group membership. According to women farmer's focus groups, this is due to the fact that men are less present in villages, as they often go out looking for work and income elsewhere.
29. Be that as it may, interviews with FAO, county authorities and farmer focus groups showed that the large participation of women in farmer groups and IPP-GAP beneficiaries does not necessarily mean women obtain the full benefit of improved agriculture activities. Several gender gaps were mentioned, related to access to productive assets and the benefit of agriculture income, which were not addressed just by having quotas of women among beneficiaries. Interviews with FAO staff showed the country office does not count with a

⁶ The IPP-GAP interim report for the period December 2015 – October 2016 reports 72.2 percent of women among beneficiaries of training for example.

gender strategy based on an in-depth knowledge of gender inequity in agriculture in the country.

30. However, FAO included a specific session on gender among the 15 sessions that constitute the extension services and farmers training programme of the project. According to FAO, this session was focused on leadership and how women could strengthen their participation in issues such as mechanization and lack of marketing opportunities. The review of this training session module showed it is not specific to the context of Kenya. The case study did not collect evidence on possible outcomes generated by this training session.
31. Interviews with county agriculture authorities and FAO revealed that some opportunities to more actively promote gender equality and integrate youth in the benefits of the project were not fully taken. Although the project adopted a value chain approach, it did not intervene on agriculture processing, which could have specifically involved women and youth.
32. The case study did not allow understanding the extent to which nutrition issues were taken into account for the selection of value chains in the two counties, as contradictory evidence was collected on this matter. According to FAO, value chains selection were informed by markets, while other stakeholders said their benefit for nutrition was also taken in account. On the other hand, the project's training programme included a specific session on nutrition and value chains.

3.1.5 Comparative advantage

33. Project stakeholders identified the following comparative advantages of FAO related to the IPP-GAP:
 - Technical knowledge: FAO has a vast amount of technical knowledge on CA, GAP and agribusiness, thanks to a large scientific and empirical library and network of professionals who can support and share past experiences and lessons learned. FAO staff, including County Project Officers, have benefited from this institutional knowledge, and translated it in the project's implementation and capacity building programme.
 - FAO's permanent presence in counties where the project is implemented allows for strong and good relationships with county authorities. It provides FAO with legitimacy to work on policy advise at county level.
 - The project puts the emphasis on commercial agriculture to promote CA adoption. This is seen as a relevant approach as compared with past projects implemented by NGOs that only focused on production and did not generate significant CA adoption. It includes the capacity of FAO to serve as an interlocutor and foster linkages with big retailers, which other development actors present in the counties don't have.
 - Experience and capacities for implementing large-scale capacity building activities: the project succeeded in reaching a large group of stakeholders, including farmers and extension services, thanks to FAO's experience in farmer field schools (FFS).

3.2 Part B: Project contribution

3.2.1 Relevance of the project to the CPF

34. The IPP-GAP explicitly aims at contributing to Outcome 2 (Productivity of medium and small-scale agriculture producers increased, diversified and aligned to markets) and 4 (Improved livelihood resilience of targeted, vulnerable populations) of the CPF.

35. The project is clearly aligned with Outcome 2 through its activities, and contributes particularly to the following planned outputs of the CPF:
- Output 2.1: *Improved productive capacity and reduced risk of medium and small-scale producers*, with the promotion of climate-smart agriculture (CSA) and GAP, the promotion of strategic partnerships across value chains with private sector, promotion of good practices in post-harvest management, support to participatory extension methodologies.
 - Output 2.3: *Improved agriculture market access and value addition along viable value chains*, with the strengthening of capacity of farmers groups and producers in agribusiness development and management, in achieving standards for agribusiness, and promotion of access to agricultural market information.
 - Output 2.4: *Improved access to financial services and products*, with the promotion of linkages of farmers groups with financial service providers.
36. As for Outcome 4, the project only contributes to Output 4.3 (Good nutritional practices that build on existing local knowledge, attitude and practices, are promoted) through the specific training session on nutrition implemented with extension services and farmers. It is worth observing that the project has not intended supporting population specifically vulnerable to shocks and/or food insecure. The project intervenes in ASALs where farmers are in general exposed to erratic rainfalls and climate vulnerability. However, beneficiary farmer selection did not include any criteria aimed at targeting vulnerable populations. The only criterion taken into account was farmer group's potential for engaging in commercial agriculture. The rationale was to promote "marketing champions" as a driving force for other farmers.

3.2.2 Relevance of the project to beneficiary needs and priorities

37. CA is particularly relevant to areas characterized by erratic rains and recurrent droughts, as it allows maintaining moisture in the soil. It is therefore particularly relevant to ASALs. This has been confirmed by agriculture authorities at both national and county level (with a higher level of adoption at county level, see Section 3.1.1). The two counties included in the case study have several agroecological areas, and agriculture authorities specifically consider CA relevant to ASALs, where agriculture is still highly dependent of rainfalls, in order to increase productivity and support households' resilience to shocks.

Women in the focus group of the Mutethie Self Help Group (Tharaka Nithi) explained that the weather has changed in the last years, with less rainfall, resulting in more frequent crop failure and reduced harvests. To cope with this situation, men have to look for jobs outside the village. However, households had to change their food consumption and rely more on less preferred products, and animal ownership has decreased, as households had to sell their animals to meet their basic needs.

Kavuthu farmer group leaders (Makueni) explained the lack of markets is one of the main challenges for the development of agriculture activities. Other main challenges are the lack of reliability of rains, lost of soil fertility and erosion that affect productivity. The group decided to engage in CA as it allows limiting soil erosion through soil coverage, keeping moisture in the soil (mulching and minimum tillage), support fertility (crop rotation, intercropping and cover crops). Other potential benefits of CA and GAPs are reducing delays in agriculture activities (ripping as compared to ploughing, chemical weed control as compared to manual control).

38. The project strategy put the emphasis on developing new and improved market opportunities as a driving force to promote CA and GAP. This strategy is found relevant to farmer's needs and priorities, and addresses their dependence on middlemen for marketing their produce. Interviews with beneficiaries showed this dependence is a major factor that discourages farmers to invest and develop their agriculture activities, due to the low prices middlemen offer, especially when households have access to other livelihood opportunities than agriculture. Their strategy is then to develop these opportunities and only maintain agriculture activities for household food production.

A farmer of the Arise and Shine Self Help group (Tharaka Nithi) who only experienced collective marketing once in 2014, explained that the group has not carried out collective marketing again due to lack of opportunities. He explained that on that occasion he extended the land he usually plants and practiced minimum tillage on one acre. This was the only time he practiced minimum tillage. He has not practiced it again due to the lack of new opportunities for collective marketing. He said it is not worth investing in agriculture and CA if the only marketing possibility is to local middlemen. He also said he would invest again in agriculture and CA if collective marketing opportunities come again, as agriculture can potentially bring him more income than other activities.

39. This strategy also takes in account lessons learned from past experiences, where NGOs have promoted CA essentially putting the emphasis on production, and that generated low levels of CA adoption.

3.2.3 Project impact and effectiveness

3.2.3.1 Farmer groups' engagement in CA

40. In five groups out of six included in the case study, interviews with farmers revealed a strong commitment of farmer groups to CA. None of the groups had practiced CA before the IPP-GAP and this engagement is therefore attributed to the project. According to group leaders, in four of these five groups the proportion of members that have adopted the three principles of CA is between 27 percent and 100 percent.⁷⁸

Other evidence shows this high level of engagement: Kitengei commercial village (Makueni) has invested in CA equipment and has bought 20 oxen rippers and 20 shallow weeders in 2017. Mutethie group uses the mulch planter that has been provided by the project for land preparation, with manpower. Most of the group members don't have access to oxen and have organized themselves to help each other for the land preparation of their plots. Using the mulch planter with manpower is very hard work, which shows the commitment of these farmers.

41. Interviews with group leaders, focus groups and individual farmers in these five groups showed that the majority of group members are clearly convinced of the benefit of CA, in terms of productivity gain, in their context of erratic rainfalls.
42. On the contrary, interviews in the sixth group, Arise and Shine in Tharaka Nithi County (included in the case study as a not successful group) showed a very low level of commitment to CA. Only five farmers out of 19 members have applied minimum tillage once, and only one

⁷ Kavuthu group: 18 farmers out of 67 members (27 percent), Ngokolani: 20 farmers out of 30 members (67 percent), Kintengei: 400 farmers out of 528 members (75 percent), Mutethei: 16 farmers out of 16 members (100 percent).

⁸ Data is not available for the fifth group (Tharaka poultry).

farmer has adopted it several times. Farmers explained attendance to trainings was very irregular. Interviews with farmers and the FAO County Project Officer showed the main reason of this low engagement in CA was the quality of the Trainer of Farmer assigned to them. The case study did not find differences in the commitment with CA between successful groups and the other less successful group included in the study (Ngokolani, in Makueni County).

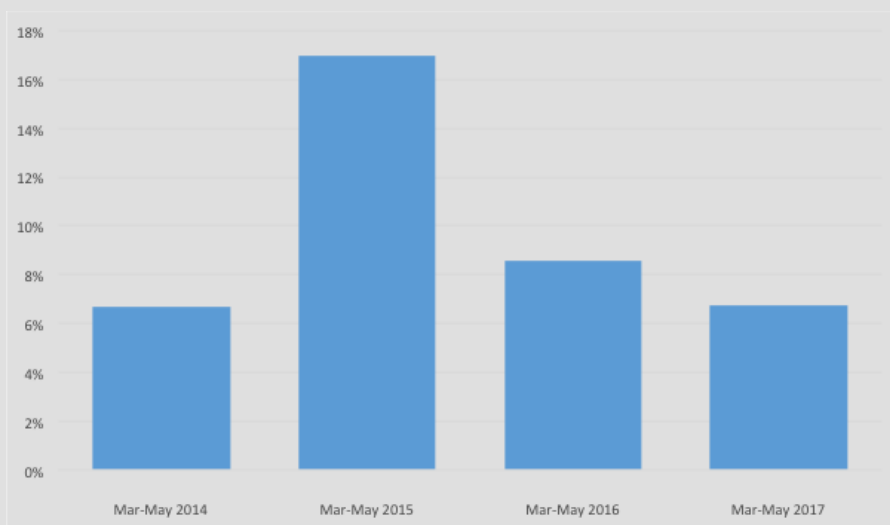
3.2.3.2 Adoption of CA and GAP

43. Despite the strong engagement of five farmer groups out of six described above, the level of adoption of the three principles of CA and proposed GAP varies.

Minimum Tillage

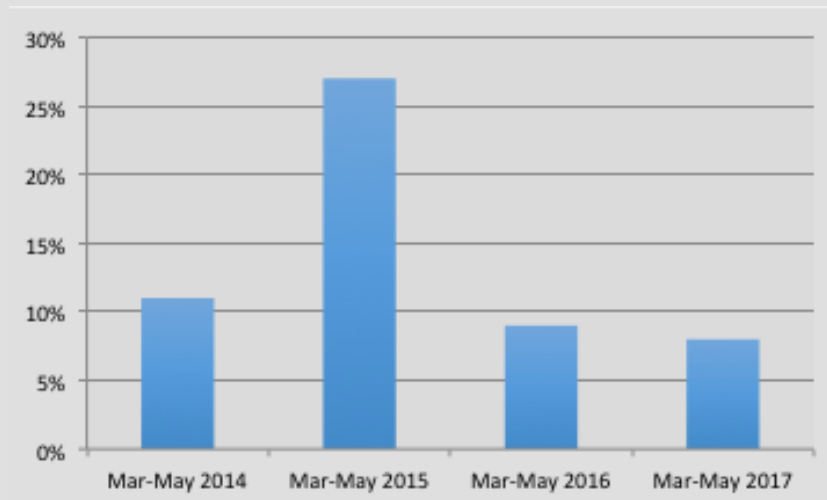
Adoption of minimum tillage in Makueni County (household survey)

Figure 1: Difference between beneficiaries and non-beneficiaries: adoption of minimum tillage



This figure shows that during the four years included in the project implementation period, project beneficiaries in Makueni County seem to have adopted minimum tillage to a larger extent than non-beneficiaries, especially in the March-May 2015 farming season.

Figure 2: Rate of adoption of minimum tillage among beneficiaries



However, according to Figure 2 adoption among project beneficiaries remains limited.

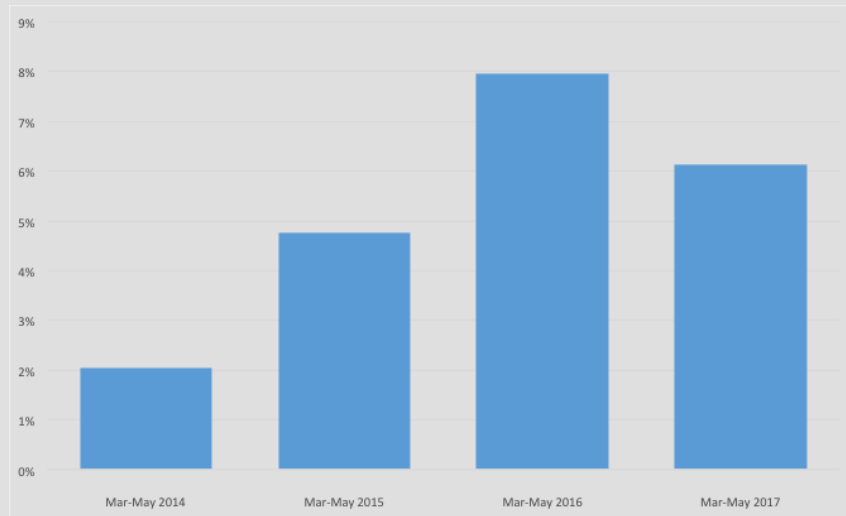
Both Figures 1 and 2 suggest a strong progression of minimum tillage among beneficiaries in 2015 and then a decrease of adoption. Below average performance of the 2016 short and long rains has led to a severe drought in the arid and semi-arid lands of Kenya. The rainfall performance was mainly related to La Niña and warm West Pacific sea surface temperatures and, as a consequence, limited crop production, pasture growth and water availability. This event can explain the large drop in the CA indicators between 2015 and 2016.

44. In line with the result of the household survey above, according to farmers, extension workers and FAO, minimum tillage is the CA principle that has the lowest level of adoption in the six groups included in the case study. However, the figures on the adoption of the three CA principles presented in paragraph 38, which also correspond to the proportion of farmers that have adopted minimum tillage, show a much higher level of adoption within these groups than overall in Makueni County (27 percent to 100 percent of group members in five groups). In addition to this, the majority of farmers only apply minimum tillage in a part of their plot and continue to plough the rest of their land (see Annex 4 for details on the application of CA principles according to interviewed individual farmers' plots). Among the 21 farmers interviewed individually, 14 farmers have adopted ripping. Only five of them apply ripping in their entire plot.

Soil coverage

Adoption of soil coverage in Makueni County (household survey)

Figure 3: Difference between beneficiaries and non-beneficiaries: adoption of soil coverage



As for minimum tillage, Figure 3 suggests that there is a higher level of adoption of soil coverage for beneficiaries than for non-beneficiaries, overall in Makueni County.

Figure 4: Rate of adoption of soil coverage among beneficiaries

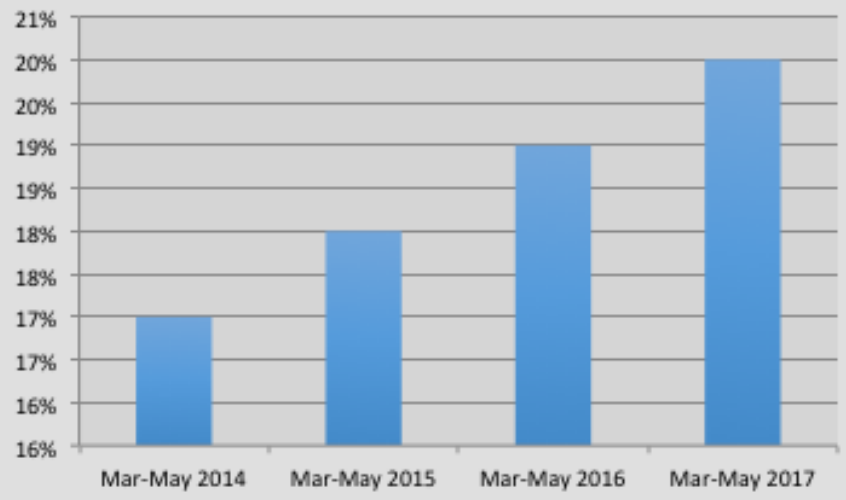


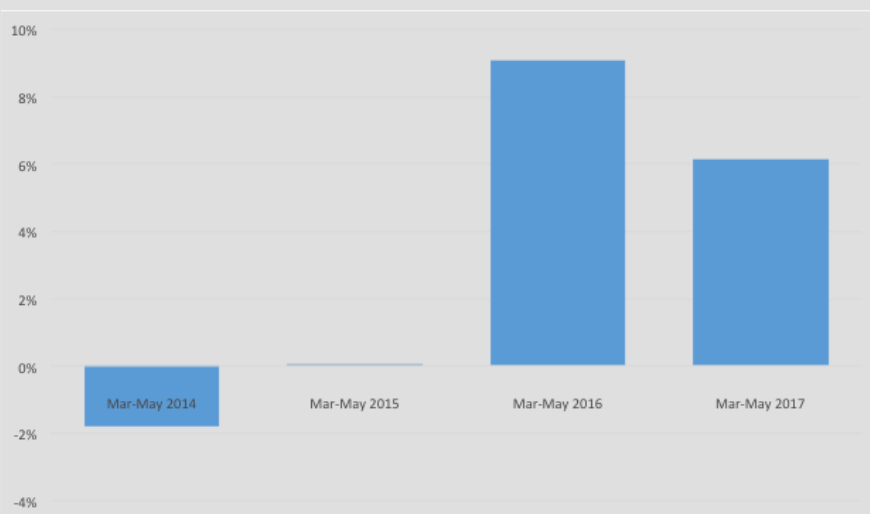
Figure 4 indicates that there was a smooth progression of adoption of soil coverage practices in Makueni County, whether it is mulching or cover crops.

45. According to interviews with farmers and extension workers, soil coverage arrives second in term of adoption, with the majority of farmers applying it. 17 farmers among the 21 farmers interviewed individually have adopted it, and 14 apply it on their entire land. Interviews did not allow stating clearly which practice is most applied between mulching and cover cropping. However, cover crop adoption is facilitated by the common practice in conventional agriculture of intercropping, while in some cases competition between mulching and animal feeding for the use of crop debris has been mentioned.

Crop rotation

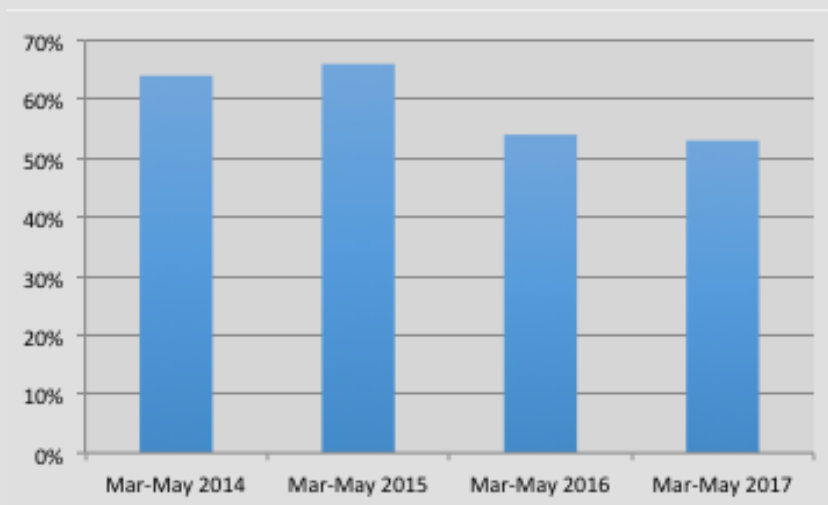
Adoption of crop rotation in Makueni County (household survey)

Figure 5: Difference between beneficiaries and non-beneficiaries: adoption of crop rotation



According to Figure 5, it appears that there was a significant progression of adoption of crop rotation by beneficiaries as compared to non-beneficiaries over the analysed period: in 2014, more non-beneficiaries were practicing crop rotation, while in 2016 and 2017 this was the inverse.

Figure 6: Rate of adoption of crop rotation among beneficiaries



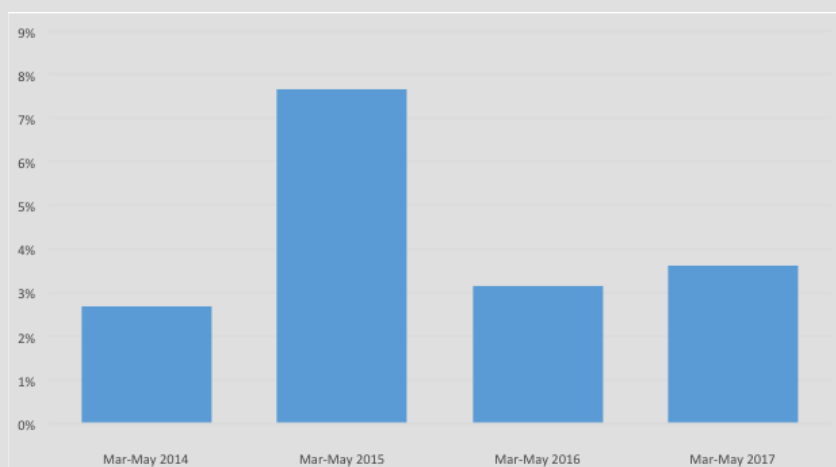
According to Figure 6 it seems that adoption of crop rotation is higher as compared to minimum tillage and soil coverage, however it decreased among beneficiaries between 2014 and 2017.

46. According to stakeholders and farmers interviewed, crop rotation is the CA principle that is the most adopted in the groups included in the case study, by almost all farmers. This result is coherent with the figures found in the household survey. Adoption of crop rotation is facilitated by the fact that farmers are used to practicing it in conventional agriculture. However, farmers have changed their rotation system thanks to the project's trainings and the evolution observed is therefore more qualitative than quantitative. 17 interviewed farmers apply crop rotation out of 21 individually interviewed, 16 on their entire plot.

Good Agriculture principles

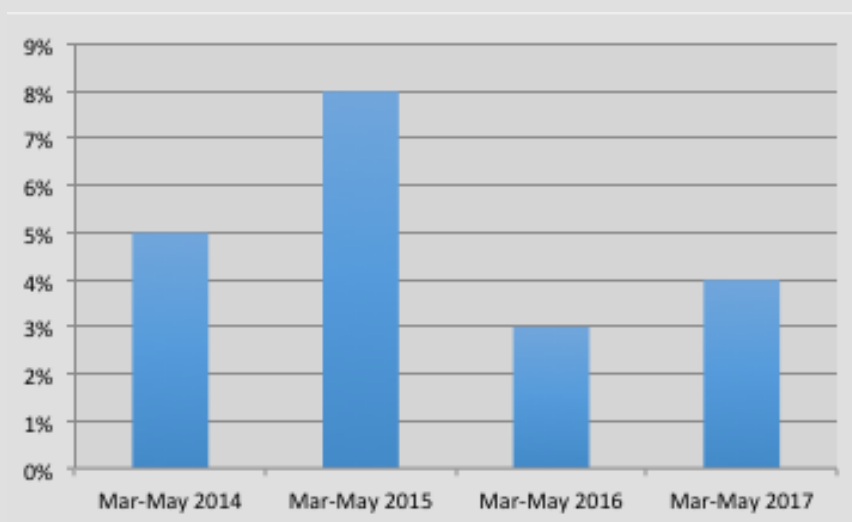
Adoption of herbicides in Makueni County (household survey)

Figure 7: Difference between beneficiaries and non-beneficiaries: adoption of herbicides



As shown in Figure 7, there is some evidence that the project allowed for a smooth level of adoption of herbicides for beneficiaries as compared with non-beneficiaries, during the four seasons covered by the survey.

Figure 8: Rate of adoption of herbicides among beneficiaries



However, as presented in Figure 8, the adoption of herbicides appears to remain low among beneficiaries in Makueni County during the four years covered by the survey.

- 47. As in the case of CA principles, interviews with farmers, extension workers and FAO showed different levels of adoption of essential GAPs, such as use of quality certified seeds, appropriate application of fertilizers and manure, and use of herbicides.

48. Interviews showed that the regular use of certified seeds has increased thanks to the project. However, the majority of farmers still take their seeds from their harvest. Similarly, appropriate combination of fertilizers and manure is still limited, and farmers rely mostly on manure. The same is true for the use of herbicides for weed control. In the six groups visited, only two groups have adopted these practices to a large extent. All individual farmers of the Mutethie Group that were interviewed now systematically buy certified seeds, apply fertilizers and manure, and herbicides, while farmers of the Tharaka poultry Group mentioned using herbicides systematically and buying seeds and fertilizers sometimes when they can afford them.

Interviews with group leaders and individual farmers included in the case study, showed that the Mutethie Self Help Group is the group that has engaged the most in CA. All its members have adopted the three principles and the main GAPs promoted by the project. On the contrary, the Arise and Shine Self Help Group is the group that has the lowest level of adoption of CA and GAPs. Only five farmers out of 19 members of that group have tried at least once one or several of the CA principles. Only one farmer has adopted the three principles on several seasons and plans to continue.

Both groups are exposed to several factors that could support or limit their engagement. However from the discussion with farmers and FAO County Project Officers, the main factors that seem to differentiate the results in these two groups is the quality and engagement of the Trainer of Farmers. In the Mutethie Group, the ToF is a private extension worker, who is a farmer from the community, and is described to be particularly committed with the project. In the Arise and Shine Group, the ToF was perceived by members as not committed and carried out very short and irregular training sessions. Farmers said they did not understand several concepts included in the trainings.

3.2.3.3 Increased yields, production and decreased production costs

49. According to informants at county level, adoption of CA and GAP has allowed significant increases in yields and production. This was triangulated in the five groups included in the study that have engaged in CA and where CA principles and GAP have been adopted to a certain extent. Farmers reported having registered production increase⁹ of 82 percent of all crops included on an average, between their last crop before adopting CA and their last harvest using CA. Among these 11 farmers, 3 of them have lost productivity due to bad rainfalls during the last cropping season.
50. This performance strongly suggests that even with a partial adoption of CA and GAP, production gains are very significant. Key informants commented in particular that CA allowed farmers maintaining a certain level of production during the October-December 2016 cropping season that was bad in terms of rainfall, as compared with farmers that have not applied CA. This finding is coherent with the results of the household survey on the perception that beneficiaries and non-beneficiaries have on the evolution of their productivity, presented below.

⁹ Production gains were estimated in 11 individual interviews.

Perception of the evolution of productivity in Makueni County (household survey)

Figure 9: Perception of the evolution of productivity among non-beneficiaries

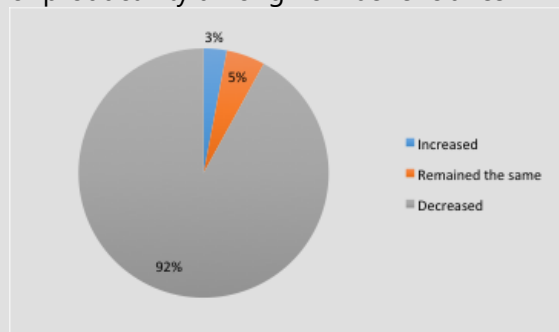
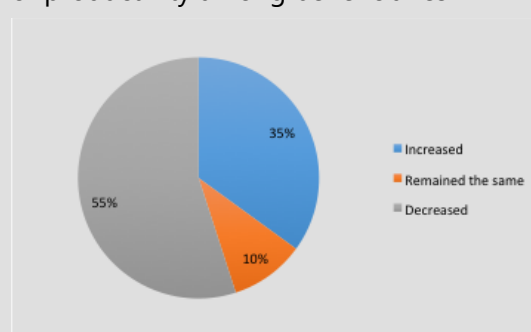
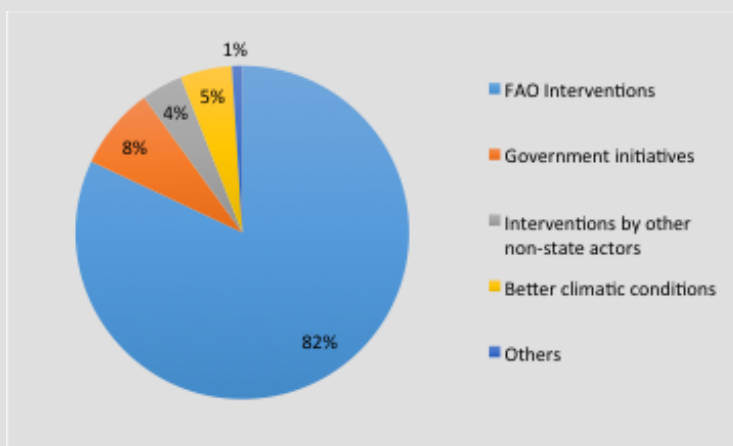


Figure 10: Perception of the evolution of productivity among beneficiaries



Based on the graph above, the proportion of beneficiaries who consider that their productivity increased between 2014 and 2017 is ten times larger than the proportion of non-beneficiaries – 35 percent *vis-à-vis* 3 percent. Concurrently, a majority of beneficiaries consider their productivity has decreased between 2014 and 2017 (55 percent), which may be linked to bad weather conditions during the period. However, a much higher proportion of non-beneficiaries (92 percent) have this perception.

Figure 11: Reasons for increased productivity



Also, among beneficiary farmers who perceive having increased their productivity, FAO interventions is pointed out as the main contributing factors (82 percent) for this increase.

- Gains in terms of reduction of production costs are linked to the use of herbicides. Farmers who don't apply herbicides don't benefit from this gain. On the contrary, their production costs increase, as during the first seasons applying minimum tillage, until mulching reaches a level that allows for a reduction of weeds development, manpower costs for weeding increase.

All farmers of the Mutethie Group said their productions costs have decreased since they have adopted CA and GAPs. As an example, a woman producer said that with conventional agriculture, cost per acre was KES about 6 000, the main cost being labour for weeding. Since she adopted CA and GAPs, production costs are about KES 3 200 /acre. This reduction is entirely due to the adoption of herbicides that allows reducing labour costs. Other farmers of the group have also reduced land preparation costs as they were used to hiring a tractor for ploughing, and they now use a mulch planter.

52. Reduction of production costs has been estimated during individual interviews for eight farmers that apply herbicides in the two groups where a significant level of adoption of herbicides has been observed (Mutethie and Tharaka Poultry Groups). They reported having reduced their overall costs by 33 percent on an average. This figure includes increase on other costs than weed control such as purchase of seeds and fertilizers, which has increased with project intervention.

A male farmer from the Tharaka Poultry Group said labour cost for weeding is KES 9 000/acre, while herbicide costs KES 2 000 /acre. As a consequence, he is now able to plant his 5 acres of land, while before he could only plant 3 acres.

3.2.3.4 Collective contract marketing

53. The main approach developed by the IPP-GAP to improve market opportunities for farmers is the direct linkage created between farmer groups and final buyers, and the establishment of marketing contracts.

54. IPP-GAP was directly involved in looking for final buyers interested in participating to the project. Four of the six groups¹⁰ included in the study have achieved collective marketing, three of them through supply contracts with final buyers, while Ngokolani Group only marketed once collectively to a broker. Contracts have been established with six final buyers.¹¹ Two groups have also marketed collectively with brokers, in addition to final buyers. Mutethie Group, which was selected as a successful group, has not marketed collectively yet due to its limited membership (16 members) and therefore limited production. However, the group has joined a CBO recently with the aim of accessing collective contract marketing and is about to sign a first contract with the East African Brewery Limited (EABL). The second farmer group that has not marketed collectively, Arise and Shine Self Help Group, was selected in the study as a less successful group and is the group where a very limited engagement in CA was found.

55. The main interest for farmer groups for marketing collectively through a supply contract is having the guarantee to sell all their production at a price negotiated at the beginning of each farming season, usually higher than what brokers usually offer. Farmers have clearly understood the advantages of this and show commitment to this mechanism.

Tharaka Poultry Group members said they used to sell their sorghum at KES 22 /kg to brokers, while they sell it at KES 32 /kg to EABL. For green grams, they used to sell it at KES 60 /kg to brokers, and they sell it now to Imara between KES 75 and 80 /kg.

56. However, according to final buyers, FAO and farmer groups, farmers have almost never honoured quantities of product agreed in contracts. On the one hand, the production has not always reached the level that was expected. On the other hand, farmers have two other priorities that come before collective marketing for the use of their production. The first one is supplying food for their household. The second one is marketing immediately at harvest time in order to pay for school fees. In the absence of a specific mechanism to allow it, collective marketing does not facilitate immediate marketing and payment, because farmers groups need time for aggregating production of their members. As a consequence, the great majority of farmers sell a part of their production during the harvest to brokers.

¹⁰ Kavuthu, Kintengei, Tharaka Poultry, Ngokolani.

¹¹ Imara, FRESKO, National Cereal Production Board, Dry Land Seed Company, East African Brewery Limited, Friken Limited.

57. The project partly reduced dependence of farmers on middlemen to market their production. According to FAO and farmer groups, another outcome generated by the new marketing opportunities is the increase of the competitiveness of the market. To date, the new market facilitated by FAO cannot really be considered as competitive, as only a few companies have participated to contract marketing with CA farmers. In addition, for several value chains (green grams, sorghum), only one company has participated to date.¹² There could be, therefore, a risk to substitute dependence from brokers to one with a few companies. It is worth observing that at least in one case, a final buyer that had signed marketing contracts did not honour the contracts. Nevertheless, FAO and farmer groups reported that a number of brokers have increased their price in order to be competitive with final buyers and remain in the market. This is considered as a valuable unintended outcome of the project, which truly offers a variety of opportunities for farmers for marketing their product. Farmer groups explained that thanks to the training on agribusiness and through collective marketing their bargaining capacity increased and they are now able to better negotiate the price and conditions when they market their product.

Leaders of the most market-oriented group among the six groups included in the study, Tharaka Nithi Poultry, which has achieved four marketing contracts, explained that during the harvest of the October–December 2016 sorghum season brokers offered higher price than the price agreed in the contract the group signed with EABL. However, farmers decided to sell their product to EABL as they are interested in consolidating the relationship with this company that offers a permanent market for sorghum with fixed price.

Ngokolani Group (Makueni) has not participated yet in contract farming with the support of FAO. However, in 2017 the Group decided to market collectively to brokers. Thanks to collective approach and the skills they acquired on negotiating via the project, they managed to obtain a price of KES 70 /kg when the broker offered KES 65 /kg.

58. Farmer group leaders consider the model of collective contract marketing as only one of various strategies farmer groups have in order to add value to their production. Another model that has been described is collectively storing production for several months and market products when the price increase due to seasonal patterns.

3.2.3.5 Increased income, improved access to basic needs, improved livelihoods

59. Focus group and individual interviews revealed that the combination of a higher production, a higher quantity of product sold and a higher price through collective marketing provided farmers with an increased income. Income gains were estimated for seven farmers of three farmer groups through individual interviews. On an average, farmers who have applied CA and participated in collective marketing processes have multiplied their agriculture income by a factor of almost four.

Significant income increase have also been achieved in groups that have not benefited from higher price through collective marketing. In the Mutethie Group, all individual farmers interviewed described important gains. As an example, a farmer who was used to produce essentially for household food production and exceptionally had an income that could reach KES 5 000 when the season was very good, has perceived income comprised between 14 000 and KES 35 000 since he adopted CA and GPAs, depending on the quality of rainfalls.

¹² East African Brewery Limited for sorghum, Imara for Green Grams, Bidco for sunflower.

60. The majority of farmers in the six farmer groups visited were used to producing mainly for household food consumption and for paying school fees. The extra income they have gained has been used for the following purposes:

- Paying school fees without implementing strategies that affect livelihoods: school fees are a main expense for households. They dedicate to it a significant part of their income, and often have to go into negative strategies, such as selling animals, go into debt or even sell major assets such as land. The extra income allowed to reduce these strategies and therefore played a role of protecting livelihoods.
- Improve food consumption: the majority of farmers interviewed individually reported they had improved their consumption through increasing the frequency of consumption of more preferred products, such as rice, chapatti and meat, and through a higher food diversity with the consumption of fruits and legumes.
- Investment in productive assets: the majority of farmers interviewed have invested part of their extra income generated by agriculture in a variety of assets that potentially will support the development of their livelihoods and contribute to their resilience. The first asset mentioned is animals, mainly goats, but also in a few cases improved poultry breed and cows. Other assets mentioned to a lower extent are water tank for rainwater harvesting, farm pond, petit trade kiosk. A few farmers have also paid labour for mulching and rented more land for agriculture.
- Improve housing: several farmers have used their extra income to buy land for their future house, to contribute to the building of a house or to electrify their house.

A farmer of the Mutethie Group explained he had sold, progressively, assets such as cows and land in order to pay school fees in the past, and that he was used to dedicating his entire agriculture production to these expenses. He said that thanks to the increased production he registered since he engaged in CA, he is now able to pay school fees without selling assets, and in addition he can keep part of his production enough for meeting his household's food needs

3.2.4 Factors that have influenced the results and sustainability

3.2.4.1 Contributing factors to achievements and sustainability

61. Interviews with both FAO and agriculture authorities in the two counties included in the study showed a **strong commitment of county authorities** on both CA and commercial agriculture using collective contracts. As mentioned in Section 3.1.1, the development of value chains is a priority for both counties, and they are in the process of **institutionalizing CA** in their policies. This factor, together with the fact that they have **planned resources to continue supporting CA** (already executed in the case of Makueni with the investment in three tractors with CA equipment), will support sustainability of the project achievements in the future.
62. In addition to that, Makueni County authorities have created a **legal office** with the aim of supporting the enforcement of agriculture marketing contracts. Two cases were reported, one of a contract that had been signed within the context of the project and a second one outside of it, where buyers did not honour the contract (one offered a lower price than the agreed one, and the other company did not buy any product). The legal office will play a role of representation of farmer groups as a legal body in order to ensure enforcement of contracts and access legal appeals in case contracts are not honoured.
63. Agriculture county authorities and extension staff consider very appropriate the **training approach** proposed in the project, which was new for them. The cascade training allowed

covering an extended area and accessing a large number of farmers in a limited time. In addition to that, the project designed a 15-session training programme to the groups during the planting season, and sometimes during several seasons, while most projects usually train farmers for a significantly lower duration. This approach allowed for better follow-up of farmers participating in the project, and contributed to higher adoption of CA and GAP.

64. Together with the appropriateness of the training approach, FAO staff interviewed reported a **good quality of extension staff** in general that contributed to creating a positive dynamic in farmer groups, increasing their understanding and adoption of proposed practices. In some occasions, and particularly in one of the unsuccessful groups included in the case study, the quality of ToF was not appropriate and was a contributing factor of failure. The project involved 1 739 extension agents, including 763 government officials and 976 agents from the private sector. According to FAO County Project Officers, in general, private agents have shown higher commitment to the project and their farmer groups than government officials, which has resulted in better performance in terms of CA and GAP adoption. They also consider that private agents are more likely to continue extension work when the project ends.
65. **Previous knowledge of CA** has contributed to CA adoption. At least in Makueni, several NGOs have introduced CA in the past at a low scale. These projects didn't achieve a high adoption; however, they created a knowledge base on CA that facilitated the understanding of its potential benefits. FAO County Project Officers consider adoption is clearly higher in sub-counties where CA had previously been introduced than in sub-counties where CA was totally new when the project started.
66. In general, **agriculture inputs** required for GAP are reported by farmers to be **available locally**, in particular in the case of certified seeds and fertilizers. It is not always the case for selective herbicides. Farmers of only three groups of the six included in the study said selective herbicides are available locally.
- In two of the three groups where selective herbicides are available locally (Mutethie and Tharaka Nithi Poultry), a significant part of members have adopted herbicides. However, in Tharaka Nithi herbicides are not always available. When not available, farmers who have a big land use their plough for weeding, which creates soil disturbance. In addition, the group leaders said selective herbicides are only available for green grams, and the lack of availability of herbicides for sorghum limits their capacity to sign larger contracts with EABL.
67. **Final buyers show a strong commitment and interest** for contracting small-scale farmers that apply CA. All the companies interviewed in the study explained both working with small-scale farmers and promoting CA are aligned with their social values. More importantly, these companies need to access more raw materials for their business and have seen the IPP-GAP as an opportunity to extend their production base and to secure production thanks to CA, especially in ASALs that are exposed to recurrent droughts. However, the limited capacity of farmer groups to supply raw material (as mentioned in Section 3.2.3, farmer groups who have signed marketing contract have almost never honoured fully the agreed quantities) could reduce the interest of final buyers for this strategy if they don't see improvements.

Box 1: Summary of factors that have contributed to achievements

<ul style="list-style-type: none"> • Commitment of county authorities with both CA and value chain development
<ul style="list-style-type: none"> • Appropriateness of the training approach
<ul style="list-style-type: none"> • Quality of extension staff
<ul style="list-style-type: none"> • Previous knowledge of CA in some areas
<ul style="list-style-type: none"> • Availability of agriculture inputs
<ul style="list-style-type: none"> • Commitment and interest of final buyers in engaging in CA with small-scale farmers

3.2.4.2 Limiting factors and challenges for sustainability

68. A major factor found as limiting CA and GAP adoption is the **financial capacity** of farmers for accessing inputs and equipment. Minimum tillage adoption is particularly affected by the lack of capacity of farmers to access both selective herbicides and CA equipment whether mechanized or towed by oxen. Weed development is higher during the first seasons of applying CA as compared to conventional agriculture and weed control has to be done manually if not done with herbicides. Same for manual ripping that limits farmer's capacity to adopt it.
69. Persistent **inaccurate beliefs on herbicides** also contribute to its limited adoption - as does the presence in the market of fake chemicals that convince farmers in not believing in the efficacy of these products.
70. The IPP-GAP supported linkage between farmers and microcredit institutions through a partnership with the Rabobank foundation. However, in Makueni County only about 300 farmers, out of 10 000 participating in the project, have accessed this service, while it has not been effective at all in Tharaka Nithi. Deficiencies in the management of the Sacco selected by Rabobank Foundation to disburse funds have contributed to this limited impact.
71. Interviews with farmer groups showed the existence of table banking systems in almost all the groups and CBOs visited. These are saving-credit systems initiated by farmers themselves that serve multi-purposes: accessing inputs or equipment, borrowing money for paying schools fees or buying foods. The capacity of these systems is still very limited as farmers have a limited saving capacity. However, they could be considered as a potential alternative to the strategy followed by the IPP-GAP of linking farmers to formal banking system that present other inconvenients, such as the lack of confidence of both farmers and credit institutions, and the low presence at field level of these institutions.

72. In general, **CA equipment is not available**. Only in one group visited farmers reported availability of CA oxen equipment locally, sold by local manufacturers trained by the IPP-GAP. Very few service providers offer mechanized CA equipment with only one group having access to such a service. Considering the project only provided CA equipment for demonstration in a limited number of farmer groups, the majority of the farmers that have participated in the project did not have an alternative other than manual labour to apply minimum tillage, which has limited its adoption.

The Kavuthu Group is the only one that said oxen rippers are available on the local market. According to group leaders, half of the members have bought a ripper.

When CA mechanized service is available, farmers are likely to use it. In the Tharaka Poultry Self Help Group, three-fourth of the members hire a tractor equipped with a ripper to prepare their land, according to the group leaders. The other farmers don't have the financial capacity to hire the tractor and use oxen plough.

73. As mentioned before, the **priority given by farmers to supplying food for their household and to paying school fees limits their engagement in collective marketing**, as they need immediate cash at the harvest. Collective marketing does not allow for an immediate payment due to the time necessary to aggregate the production of all farmers participating in the contract. Complementary mechanisms would be required, such as access to loans secured by the production or the capacity of farmer groups and CBOs to provide an advance on payment to farmers when they deliver their production.

74. Access to **aggregation centres** for farmer groups is a limiting factor for engaging in collective marketing. A few farmer groups own a storage facility and the majority of them rely on renting at high cost that limit the time they can access an aggregation centre.

75. **FAO has played a central role in identifying final buyers**, mostly in Nairobi, and in linking **farmer groups and buyers**. Farmer groups have had limited direct contacts with buyers and don't seem to be fully empowered for looking for new buyers and negotiate the terms of marketing contracts. Some buyers, such as the East African Brewery Limited, have the capacity to engage through staff located in counties, and are able to maintain the relationships with farmer groups with whom they have signed contracts and create relations with new groups. However, other buyers, such as Imara, that only has one staff in the country, don't have this capacity. According to FAO, the e-platform created by the service provider Esoko could play a role in linking farmers with potential or already engaged buyers. However, to date, Esoko did not succeed in engaging directly with farmers on its paid service. According to Esoko, this is one of the main reasons for changing its strategy and contract with development institutions such as FAO. The sustainability of commercial relationships created between farmers and final buyers seems therefore not to be guaranteed for all buyers.

Box 2: Summary of factors and challenges that limit achievements and sustainability

<ul style="list-style-type: none"> Limited financial capacity of farmers to access inputs and equipment
<ul style="list-style-type: none"> Persistence of inaccurate technical beliefs
<ul style="list-style-type: none"> Lack of marketing contract enforcement by farmers, due to their need to access cash as soon as possible at the harvest
<ul style="list-style-type: none"> Lack and high cost of aggregation centres

- Lack of farmer groups and county authorities empowerment for maintaining relationships with final buyers and looking for new market opportunities

4. Conclusions and recommendations

4.1 Conclusions

76. The case study confirmed the relevance of the project objectives and strategy to the needs and priorities of farmers in Makueni and Tharaka Nithi counties. It also confirmed its alignment with county authority priorities for agriculture development and resilience.
77. In the two counties, and in five farmer groups out of the six included in the study, several significant achievements have been identified. As a result of the large-scale and appropriate extension programme, the project generated a relatively high level of adoption of CA principles, which has resulted in significant increase of yields and production, in particular but not only when bad rainfalls have affected production in conventional agriculture. FAO's involvement in creating new marketing opportunities has generated the establishment of collective marketing contracts with final buyers for half of the groups, which allowed them to reduce their dependence on middlemen and improve the value of their production. A fourth group has achieved a collective marketing agreement on its own with local brokers. An even more significant achievement is the increase of competitiveness of the market that diversifies opportunities for farmer groups. As a result of both production increase and higher marketing price, farmers have significantly increased their income, allowing them to better address their basic needs and reducing negative strategies that affect livelihoods, and invest in diversified livelihoods that will potentially strengthen their resilience to shocks.
78. The sixth group included in the study did not achieve any of these outcomes. The main identified factor, as compared with other groups, is the low quality and commitment of the ToF involved in this community. More generally, private extension workers are considered to be more committed and to offer higher sustainability perspectives than government officials.
79. A number of remaining challenges that limit the extent of these achievements and their sustainability have also been identified:
 - reduced financial capacity of farmers, that limits their access to inputs and equipment and therefore the adoption of CA and GAP;
 - low availability of CA equipment, both oxen towed and mechanized, which has almost not been addressed by the project in the two counties;
 - lack of enforcement of marketing contracts, mainly by farmers who prioritize other uses of their production, but in some cases also by buyers;
 - lack of empowerment of farmer groups and county authorities in the search of new marketing opportunities and interlocution with buyers;
 - limited ownership of aggregation centres by farmer organizations that reduce the efficiency of this aspect of the value chains and marketing strategy options for farmers.
80. Value chain development is a clear priority for county authorities. CA has also been adopted and is in the process of being "institutionalized". The interest and commitment of county authorities and the choice of FAO to implement the project in partnership with county agriculture authorities are factors that have supported the achievements of the project and offer perspectives of sustainability. Despite a clear interest for CA, the Ministry of Agriculture still prioritizes other measures, such as irrigation for agriculture development and resilience in ASALs. The IPP-GAP has not systematically collected or widely distributed evidence of the benefit of CA to date. It should put a strong emphasis on this aspect until the end of project

implementation period in order to promote adoption and institutionalization at national level.

81. The project has exceeded its target in terms of women participation among beneficiaries. However, women participation does not necessarily generate outcomes in terms of gender equality and women empowerment. More should be done in that sense.

4.2 Recommendations

82. **Invest in evidence building on the benefits of CA in Kenya in order to support its adoption and institutionalization at national level for ASALs agriculture development.** FAO has engaged late in building evidence on the project achievements. A monitoring system that will measure aspects such as CA and GAP adoption and outcomes has only started to be operational in the March-June 2017 farming season. At the moment of this case study, no overall data is therefore available on the benefits of CA and GAP. The Ministry of Agriculture showed interest in CA, but still considers other approaches such as irrigation and water harvesting as priorities for agriculture development and resilience building in ASALs. In the last year remaining for project implementation, FAO should put the emphasis on building the evidence base and presenting it to the Ministry of Agriculture and other stakeholders in order to support the institutionalization of CA at national level, which would support the sustainability and replication of the project's achievements.
83. **Adopt a more developed value chain approach in order to better address the challenges that still exist for CA adoption and marketing opportunities.** The project put the emphasis on agribusiness through the creation of linkages between producers and final buyers. However, other aspects of the value chains, such as availability and access to inputs and equipment or the financial capacity of farmers, have been addressed superficially and represent challenges for the creation and sustainability of impact. Discussions are now ongoing between stakeholders for a second phase of the IPP-GAP. FAO should include a more developed approach on value chains in the second phase (were to proceed), that should be based on an in-depth value chain analysis in order to address thoroughly all the aspects that represent threats and challenges for effectiveness of the value chains. A value chain approach should also propose more emphasis on coordination between the stakeholders involved at county level, so that they can better understand the specific needs of each other and propose adapted solutions and services.
84. **Formulate a gender strategy for the country office** that proposes a more proactive approach to gender than quotas of women among project's beneficiaries. Such a strategy should be based on an in-depth assessment and analysis of gender inequity in agriculture in the country.
85. **Develop activities aimed at strengthening CA equipment availability at local level.** FAO and extension services should carry out systematic training of local manufacturers on the production of oxen CA equipment. In a potential second phase of the IPP-GAP, FAO should also explore opportunities and relevant approaches to support the development of the provision of mechanized services. This could be done through the support to farmer groups and/or CBOs to access their own equipment, on the model of the Muungano Nguvu Yetu CBO in Makueni County. This CBO was supported by an NGO to acquire a tractor with CA equipment and is providing mechanized services to a large number of its members. The CBO is now saving resources to invest in a second tractor.

86. **Support financial capacity for farmers to access inputs and CA equipment.** Lack of financial capacity and access to credit for farmers is an important limiting factor for CA and GAP adoption. The IPP-GAP has facilitated linkages between farmers and credit service providers but it has not been effective. FAO should explore an alternative approach based on supporting existing table banking systems initiated by farmer groups with farmers' savings. Such systems are more flexible than the formal credit institutions and benefit from a higher confidence of farmers. They also offer the possibility to serve multi purposes that correspond to challenges identified in this case study, such as access to inputs and equipment, and timely payment of school fees without selling part of the production to brokers.
87. **Linked to Recommendation 5, FAO should explore the relevance in the context of Kenya of the concept of multifunctional warehouses applied by FAO in other countries.** This concept associates the creation of community storing capacities and multi-purpose credit systems. It could be entrenched on the existing table banking systems and support complementary strategies for marketing already elaborated by some farmer organizations, such as production storage and sale as seasonal prices rise.
88. **Put more emphasis on the empowerment of farmer groups and county agriculture authorities for the development of new market linkages.** FAO has played a central role in the development of new market linkages between farmer groups and final buyers. Challenges have been found for the sustainability of at least a part of the relationships created and the development of new relationships. During the remaining period of implementation of the IPP-GAP, FAO should put the emphasis on empowering farmer groups and county authorities so that they can maintain and replicate the relationships that have been created.

5. Annexes

Annex 1. Case study matrix

1 Part A: Strategic positioning: Are we doing what is needed?						
Strategic relevance						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
2	To what extent the 079 project approach is aligned and appropriate to the devolution process?	<p>2.1 To what extent the project design and implementation approach is appropriate to the devolution process?</p> <p>2.2 To what extent the 079 project contributes to build capacities at county level in the framework of the devolution process?</p> <p>2.3 What are the challenges facing FAO in delivering in a devolved context?</p>	<p>Significance of measures taken by FAO to adapt to the devolution process</p> <p>Appropriateness of capacity building activities to the needs created by the devolution process</p> <p>Type of challenges</p>	<ul style="list-style-type: none"> Key informants: FAO staff, County officials; 	<ul style="list-style-type: none"> Document analysis worksheets Semi-structured interview guides 	

<p>3</p>	<p>Is the 079 project relevant for strengthening the resilience to shocks of beneficiaries and mitigate their effects in the selected counties?</p>	<p>2.4 What are the opportunities this creates?</p> <p>3.1 To what extent the objectives, activities and technical options of the 079 project can contribute to create resilience to shocks in the context of the project zones of intervention?</p> <p>3.2 What synergies have been built between the 079 project and other FAO projects explicitly aiming at building resilience?</p>	<p>Type of opportunities</p> <p>Relevance of objectives, activities and technical options to the needs of the target beneficiaries related to their vulnerability to shocks</p> <p>Coordination between the 079 project and resilience project teams during the design and the implementation of the project</p>	<ul style="list-style-type: none"> • Key informants: FAO officials, county officials, development partners, beneficiaries 	<ul style="list-style-type: none"> • Document analysis worksheets • Semi-structured interview guides • FGD guides; 	
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Partnerships and coordination						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
4	How effectively did FAO engage in partnerships within the 079 project?	<p>4.1 In what types of partnerships did FAO enter within the 079 project?</p> <p>4.2 To what extent were these partnerships relevant and effective considering the project's objective and the context of the target counties?</p> <p>4.3 Were there any challenges by working through partnerships that may have impacted</p>	<p>Type of partnerships</p> <p>Mandate and capacities of participating partners.</p> <p>Contribution of partners in the level of effectiveness of the project implementation</p> <p>Type of challenges</p>	<ul style="list-style-type: none"> Key informants: FAO officials, Government of Kenya officials, county officials, partners Documents: Meeting minutes, progress reports 	<ul style="list-style-type: none"> Document analysis worksheets; Semi-structured interview guides; 	

		<p>on the effective delivery of the FAO programme?</p> <p>4.4 Are there other potential partnership opportunities?</p> <p>4.5 To what extent has FAO supported the coordination of actors working in conservation agriculture and value chain?</p>	<p>Partnership opportunities identified</p> <p>Type of role FAO played</p>			
Normative values						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
5	To what extent the 079 project has applied FAO normative values and principles such as equity, gender, human rights, in the design and	5.1 How did FAO ensure that UN values and principles (i.e. equality, dignity, access) were considered during project design?	<p>Degree of familiarity of 079 project team with UN values and principles</p> <p>Processes in place that promote incorporation of</p>	<ul style="list-style-type: none"> Key informants: FAO officials, beneficiaries; partners, beneficiaries Documents: procedures, 	<ul style="list-style-type: none"> Semi-structured interview guides Document analysis worksheets FGD guides 	

	<p>implementation of the project 079?</p>	<p>5.2 How are the UN values and principles promoted during implementation?</p>	<p>these during design</p> <p>Level of integration if UN value in the implementation: targeting the most vulnerable, promotion of gender equity and women empowerment</p>	<p>routing slips, project docs, progress reports</p>		
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Comparative advantage						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
6	What role has FAO played in the areas covered by the project 079 (conservation agriculture, value chain approach, agribusiness, etc.) <i>vis-à-vis</i> other development actors at national and selected county level?	6.1 What are FAO's areas of comparative advantage in these areas?	Perception of FAO's comparative advantage	<ul style="list-style-type: none"> Key informants: FAO officials, Government of Kenya officials, county officials, development partners, comparable actors, beneficiaries 	<ul style="list-style-type: none"> Document and website analysis worksheets Semi-structured interview guides FGD guides 	

2 Part B: Programme contribution: Are we making a difference?						
Relevance						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
8	How appropriate have 079 project activities been to achieve the planned CPF outcomes, especially Outcomes 2 and 4?	8.1 For Outcomes 2 and 4, have the activities been: <ul style="list-style-type: none"> • based on needs? • timely? • complementary to other activities (within and across outcomes)? 	Existence of needs assessment used for the project design	<ul style="list-style-type: none"> • Documents: project docs, reports, evaluations • Key informants: FAO officials, Government of Kenya officials, county officials, development partners, beneficiaries 	<ul style="list-style-type: none"> • Document analysis worksheets • Semi-structured interview guides • Questionnaires • FGD guides 	
9	In the areas of capacity development, policy advice and technical advice, has 079 project supported the key actors with the necessary contents,	9.1 What key actors have been recipients of FAO support in those areas? 9.2 What kind of support did FAO provide?	List of key actors supported Degree of appropriateness of support provided			

10	<p>at national and county level?</p> <p>Has FAO targeted the appropriate households in direct support, including the poorest and most vulnerable households and responded to their needs (i.e. including women and young people)?</p>	<p>9.3 To what extent has FAO provided the actors with the necessary holistic technical and functional support?</p> <p>10.1 What households were targeted (per category)?</p> <p>10.2 What approach did FAO take to target those households (per category)?</p>	<p>Analysis of FAO's approach to targeting vulnerable populations and affected areas</p>			
Impact and effectiveness						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes

<p>11</p>	<p>What changes can be observed on beneficiaries and stakeholders of 079 project that the project contributed to (e.g. behavioural changes; institutional changes; policy changes; technical adaptations; tangible socio-economic benefits, etc.)?</p>	<p>11.1 What are the main changes in beneficiary agricultural practices, access to market, livelihoods, income that the project contributed to?</p>	<p>Evolution of agricultural practices, in market access, income and livelihoods</p>	<ul style="list-style-type: none"> • Documents: project docs., reports • Key informants: FAO officials, Government of Kenya officials, county officials, beneficiaries 	<ul style="list-style-type: none"> • Document analysis worksheets • Semi-structured interview guides • FGD guides • Observation 	
<p>12</p>	<p>What are the contextual factors that have affected the achievement of results of the project?</p>	<p>12.1 What are enabling factors that contribute to the achievement of results?</p> <p>12.1.1 How can these be enhanced?</p>	<p>Enabling and limiting factors identified</p> <p>Actions needed to be taken identified</p>			

		<p>12.2 What are the factors limiting the achievement of results?</p> <p>12.2.1 What actions need to be taken to overcome any barriers that limit the achievement of results?</p>				
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Sustainability of Results						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
13	To what extent are the changes achieved sustainable (i.e. economic, social and ecological)?	13.1 What were the enabling factors? 13.2 What were the limiting factors?	Practices, behaviours, socio-economic gains maintained	<ul style="list-style-type: none"> • Documents: project docs., reports • Key informants: FAO officials, county officials, development partners, beneficiaries 	<ul style="list-style-type: none"> • Document analysis worksheets • Semi-structured interview guides • FGD guides • Observation 	
14	To what extent are the results owned by beneficiaries?	14.1 How is ownership manifested?	Beneficiaries' perceptions			
15	What measures has FAO put in place to ensure continuity?	15.1 Measures included in the project design to ensure sustainability of the results	List of measures			

Coherence and Synergies						
#	Main Questions	Sub-questions	Evaluative criteria and/or indicators	Data sources	Data collection instruments	Notes
16	How and to what extent has FAO headquarters, Regional Office for Africa (RAF) and Subregional Office for Eastern Africa (SFE) provided the necessary and appropriate technical support?	16.1 What type of support has been provided? 16.2 What is the added value?	Type and utility of support provided	<ul style="list-style-type: none"> • Documents: project docs., reports • Key informants: FAO officials (HQ, RAF, SFE, KEN); county authorities, partners 	<ul style="list-style-type: none"> • Document analysis worksheets; • Semi-structured interview guides 	
17	Has FAO's knowledge base (normative products, guidelines, publications, etc.) been effectively used at the 079 project level in the areas of FAO's	17.1 What normative products have been used by 079 project stakeholders? 17.2 What is the added value?	List of products used and their utility in the project			

<p>18</p>	<p>comparative advantage?</p> <p>How, if at all, has knowledge and lessons learned generated in the project been effectively shared at country, regional and global levels?</p>	<p>18.1 What capitalization activities have been carried out in the 079 project?</p> <p>18.2 How and where have they been shared?</p>	<p>List of activities shared</p>	<ul style="list-style-type: none"> • Documents: project docs., reports • Key informants: FAO officials 		
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Annex 2. County selection criteria

Criteria representing potential factors of differentiation of the project's results	Counties where these factors show better results
Starting periods for the implementation of activities	Training activities have first started in Kitui, Machakos, Makueni, Tharaka Nithi
Refresher training on CA carried out between December 2015 and October 2016	Makueni, Meru, Tharaka Nithi, Laikipia
Level of participation of county authorities (Letter of Agreement signed for the overall supervision and monitoring of activities)	Machakos, Kitui, Makueni, Tharaka Nithi
Adoption of CA policies by county authorities	Makueni, Laikipia
Access to credit for farmer groups	Makueni, Machakos (before November 2015); Tharaka Nithi, Kitui (after November 2015) Access through UTS in Makueni and Machakos
Linkages with trading companies	<ul style="list-style-type: none"> - 30 000 MT of green grams and pigeon peas ordered in Tharaka Nithi, Kitui and Makueni - Contracts established with premium price for soy bean and sunflower in Tharaka Nithi - Sale of 39 MT of sorghum in Kuiti and Tharaka Nithi - Sale of 131 MT of pigeon peas in Makueni

Annex 3. Stakeholders involved in the case study

Stakeholders	Role in the project	Role in the case study
FAO		
Country office Crops and agribusiness unit	Overall coordination and management of the project	Essential source of secondary (literature) and primary information
County sub-offices County programme officers	Implementation of activities in their county	Essential source of information on the activities implemented and results achieved in the selected counties
Headquarters, Regional Office for Africa (RAF) Technical units involved in the project	Technical support and provision of normative products	Source of secondary information. Remote interviews may be organized if necessary
Authorities		
Ministry of agriculture	No direct participation	Source of information on national policies in the areas related to the project
County authorities Executive committee members in charge of agriculture Chief officers in agriculture Directors of agriculture Sub-county officers Master trainers, extensionists	Main partner for the implementation of activities Beneficiary of capacity development activities	Essential source of information on the activities implemented and results achieved in the selected counties, as well as on the outcomes of capacity development activities
Beneficiaries		
Group leaders Trainers of farmers Farmers participants in trainings Farmers participants in field days	Main beneficiaries of the project	Essential source of information on the relevance, efficiency, impact and sustainability of project activities

Farmers participants in marketing agreements Farmers will be interviewed in focus groups and individually (men and women separated)		
NGOs		
Personnel in charge of agriculture, food security and resilience projects at national and county level Extensionists (Lutheran World Relief, Anglican Development Services, Comitato Europeo di Formazione Agraria, etc.)	Beneficiaries of capacity development activities Participant to sectorial coordination	Source of information on the outcomes of capacity development activities, FAO's comparative advantage and efficiency of coordination
Private sector		
Service providers: agro-inputs, ploughing, extension services, etc.	Participate in agriculture value chains. Have benefited from capacity development activities	Source of information on the relevance, efficiency and sustainability of activities and benefits
Trading companies at national and county level (East Africa Breweries Limited, BIDCO company, brokers, etc.)	Participate in agriculture products trading agreements	Source of information of the changes supported by the project in agriculture marketing systems and their sustainability
Agriculture credit service providers at national and county level (Universal Traders Sacco, others)	Provide credit services to beneficiaries of the project	Source of information on the effectiveness and sustainability of the project's activities related to agriculture credit
Project partners and service providers E-platform (Mediae Company) Mobile phone-based learning network service provider Call centre service provider E-voucher package (KCEP-CRAL)	Provide services to the project for the implementation of capacity building activities	Source of information on the effectiveness of the project's related activities

Donors		
European Union	Provide funding of the project	Source of information on the overall relevance of the project and quality of implementation

Annex 4. Application of CA principles in plots of farmers interviewed in the case study

Farmer group	Gender	Land planted (acre)	Ripped	Ploughed	Zai pits	Crop rotation	Mulching	Cover crop
Kuvuthu (Makueni, successful)	F	1	0 (0%)	0,75 (75%)	0,25 (25%)	1 (100%)	0,25 (25%)	0,75 (75%)
	F	6	0 (0%)	6 (100%)	0 (0%)	6 (100%)	6 (100%)	
	M	2	0,5 (25%)	1,5 (0,75%)	0 (0%)	2 (100%)	2 (100%)	
	M	1,5	0,5 (33%)	1 (66%)	0 (0%)	1,5 (100%)	0,5 (33%)	1 (66%)
Kitengei commercial village (Makueni, successful)	F	6	2 (33%)	4 (66%)	0 (0%)	6 (100%)	6 (100%)	
	M	3	1 (33%)	2 (66%)	0 (0%)	3 (100%)	1 (33%)	
Ngokalani (Makueni, not successful)	F	3	3 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	M	3,5	3 (86%)	0,5 (14%)	0 (0%)	3,5 (100%)	0 (0%)	2 (57%)
	F	10	2 (20%)	8 (80%)	0 (0%)	2 (20%)	2 (20%)	
Arise and Shine (Tharaka Nithi, not successful)	M	0	0 (0%)	4 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	M	2	2 (100%)	0 (0%)	0 (0%)	2 (100%)	2 (100%)	

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	F	2	0 (0%)	2 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	F	1	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Mutethie (Tharaka Nithi, successful)	M	3	3 (100%)	0 (0%)	0 (0%)	3 (100%)	3 (100%)	
	F	4	4 (100%)	0 (0%)	0 (0%)	4 (100%)	4 (100%)	
	F	7	4 (57%)	3 (43%)	0 (0%)	7 (100%)	7 (100%)	
	M	1,5	1,5 (100%)	0 (0%)	0 (0%)	1,5 (100%)	1,5 (100%)	
Tharaka poultry (Tharaka Nithi, successful)	F	1,75	1,75 (100%)	0 (0%)	0 (0%)	1,75 (100%)	1,75 (100%)	
	M	11	0 (0%)	11 (100%)	0 (0%)	11 (100%)	11 (100%)	
	M	5	5 (100%)	0 (0%)	0 (0%)	5 (100%)	5 (100%)	
	F	2	0 (0%)	2 (100%)	0 (0%)	2 (100%)	2 (100%)	

Annex 5. List of people met during the field mission

Name	Organization	Function
Nairobi		
Alessio Colussi	FAO	Head of Plant protection unit
Tito Arunga	FAO	Plant protection unit
Philomena Chege	State Department of Agriculture	
Stephen Wathome	European Union	
John Wachira Karivki	BIDCO	Lead agri-business development
Wycliffe Aua	ESSOKO	Content Manger
Emmanuel Soita	ESSOKO	Field operation manager
Dan Mutua	Imara Agro Kenya Limited	Manager
Lawrence Mania	East African Malting Limited	General manager
Makueni County		
James Opiyo	FAO	County Programme Officer
Mary Muteti	Makueni Country Authority	Chief Officer Agriculture, fisheries, livestock
Jonhson Gachuli	Tractor Applying Services	Manager
Wilfred Nguzo	Agriculture mechanization service	Deputy manager
Victor Oluteyo	Agriculture mechanization service	Deputy director land development
Mike Nzuma	United Traders Sacco	Manager
Charles Ndungu	ASDSP	Leader
Joseph Musyoka	Lutheran World Relief	Coordinator CARE Project
Jacobus Kiilu	County government	CEC Agriculture, fisheries, livestock
Tharaka Nithi County		
Ambrose Ngetich	FAO	County Programme Officer

Walter Mugambi	County authority	Chief officer Agriculture, livestock, fisheries
John Wahome	Agrovet shop	Manager
Abraham Maruta	CARITAS	Team leader
Keneth Mburia	County authority	CEC Agriculture, fisheries, livestock
Mary Gathinga	County authority	Crop development officer
Obadieh Munene	County authority	Agribusiness development officer
Samuel Mbaka	Thamani Sacco	Marketing manager
Peter Mutegi Mucee	Tegemeo Enterprises Limited	Manager
Beatrice Nkatha Muniji	Sorghum Pioneer Agencies	Director

Annex 6. Field mission schedule

Date	Activity
28/05	Travel Madrid-Nairobi
29/05	Nairobi <ul style="list-style-type: none"> • Interview with FAO country office • Interviews with stakeholders
30/05	Nairobi <ul style="list-style-type: none"> • Interviews with stakeholders
31/05	Travel Nairobi-Wote (Makueni county) <ul style="list-style-type: none"> • Interview with Master trainers and Trainers of Farmers • Interviews with county authorities • Interviews with service providers
01/06	Makueni county <ul style="list-style-type: none"> • Interviews with service providers and stakeholders • Visit to Muungano Nguvu Yetu CBO • Interview with FAO County Project Officer
02/06	Makueni county <ul style="list-style-type: none"> • Visit to Kavuthu farmer group • Interviews with county authorities
03/06	Makueni county <ul style="list-style-type: none"> • Visit to Kitengei Commercial Village
04/06	Makueni county <ul style="list-style-type: none"> • Visit to Ngokolani farmer group • Interview with FAO County Project Officer
05/06	Travel Wote-Chuka (Tharaka Nithi) <ul style="list-style-type: none"> • Interview with county authority • Interview with MT and ToF • Interviews service providers
06/06	Tharaka Nithi <ul style="list-style-type: none"> • Interviews with stakeholders • Interview with county authority • Interview with private extension staff
07/06	Tharaka Nithi <ul style="list-style-type: none"> • Interview with FAO County Project Officer • Visit to Arise and Shine self-help group
08/06	Tharaka Nithi

	<ul style="list-style-type: none"> • Interview with service provider • Visit to Mutethie self-help group • Interview with FAO County Project Officer
09/06	<p>Tharaka Nithi</p> <ul style="list-style-type: none"> • Interview with service provider • Visit to Tharaka Poultry self-help group • Interview with cereal growing association
10/06	Travel Tharaka Nithi-Nairobi
11/06	Synthesis of preliminary findings
12/06	<p>Nairobi</p> <ul style="list-style-type: none"> • Interviews with stakeholders • Interview with FAO Country Officer <p>Travel Nairobi-Madrid</p>

