Towards Climate-Smart Agriculture in Southeast Asia

Initial results in Ma Village, Vietnam

Working Paper No. 198

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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RESEARCH PROGRAM ON
Climate Change, Agriculture and Food Security
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Correct citation:
Hoang Thi Lua and Vernooy Ronnie. 2017. Towards climate-smart agriculture in Southeast Asia. Initial results in Ma village, Vietnam. CCAFS Working Paper No.198. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Titles in this Working Paper series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

This document is published by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), which is a strategic partnership of the CGIAR and the Earth System Science Partnership (ESSP). CCAFS is supported by the CGIAR Fund, the Danish International Development Agency (DANIDA), the Government of Australia (ACIAR), Irish Aid, Environment Canada, Ministry of Foreign Affairs for the Netherlands, Swiss Agency for Development and Cooperation (SDC), Instituto de Investigação Científica Tropical (IICT), UK Aid, and the European Union (EU). The Program is carried out with technical support from the International Fund for Agricultural Development (IFAD).

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CCAFS Working Paper No. 198

Photos: Bioversity/Ronnie Vernooy

Abstract

The project *Integrated agricultural technologies for enhanced adaptive capacity and resilient livelihoods in climate-smart villages (CSVs) of Southeast Asia* aims to provide climate-smart agriculture options to enhance adaptive capacity and resilience among CSV farmers and stakeholders. The project is supported by a monitoring and evaluation (M&E) plan that has two broad dimensions: a technical one that deals with the biophysical research results and a social one that deals with how they key actors involved in the research experience progress, costs and benefits, achievements and challenges. A first M&E field mission to Ma village, Vietnam, at the end of 2016 used qualitative methods to assess initial progress of the social dimension. Ma women and men farmers are satisfied with emerging results of most of the introduced climate-smart practices and highly appreciative of the collaborative approach. Full adoption will increase efficiency of resource use within the farm and could contribute to increased farm productivity and income of households. However, in order to promote wide-scale adoption of these practices, a well-thought out-scaling strategy should be designed and implemented.

Keywords

Adoption; Climate-smart agriculture; Monitoring; Scaling-out; Vietnam.

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Acknowledgements

We thank Bui Le Vinh of CIAT Vietnam and his team for the support provided to carry out the M&E mission in Ma village and the Ma villagers for their kind collaboration. We acknowledge the CCAFS program for the financial support. Opinions expressed in this report are those of the authors only.

Contents

Acronyms

CSA	climate-smart agriculture
CSV	climate-smart village
FGD	focus group discussion
M&E	monitoring and evaluation

Introduction

The *Integrated agricultural technologies for enhanced adaptive capacity and resilient livelihoods in climate-smart villages (CSVs) of Southeast Asia* project is a flagship project under the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in Southeast Asia. It aims to provide climate-smart agriculture (CSA) options to enhance adaptive capacity and resilience among climate-smart village (CSV) farmers and other stakeholders. It focuses on integrated CSA technologies and practices which can be applied at scale across crops/farming systems, aiming to improving farm productivity/income generation and food security while conserving natural resources. Through on-farm/participatory testing of context specific climate smart technologies and practices derived from earlier research of CGIAR Centers and their programmes, the project aims to shed light on the process of practical application of introduced technologies, assess their suitability at farm level and from farm to landscape level. The CIAT team in Hanoi coordinates the research in Ma village.

Ma village is one of the pilot CSVs where a set of CSA practices is introduced and tested as part of a broader set of CCAFS' research and capacity development activities (background information about the village can be found in the baseline studies carried out by CCAFS). Mạ is the largest village in 15 villages in Vĩnh Kiên Commune, Yên Bình District, Yên Bái Province with geographical coordinates 21.74^{o}N, 105.08^{o}E, at a distance of about 160 km far from Hanoi. Yen Bai is one of the 15 provinces in the northern mountainous region of Vietnam. The province is situated in between the Northwest and Northeast regions of Vietnam, bordering Ha Giang and Tuyen Quang in the east, Son La in the west, Phu Tho in south and Lao Cai province in the north.

Mạ village has a total land area of about 350 ha, classified according to land use patterns as follows: double-crop rice land (12.34 ha), single-crop rice land (3 ha) other crops' land (over 100 ha), forestry land (220 ha), land for residential and flood plain

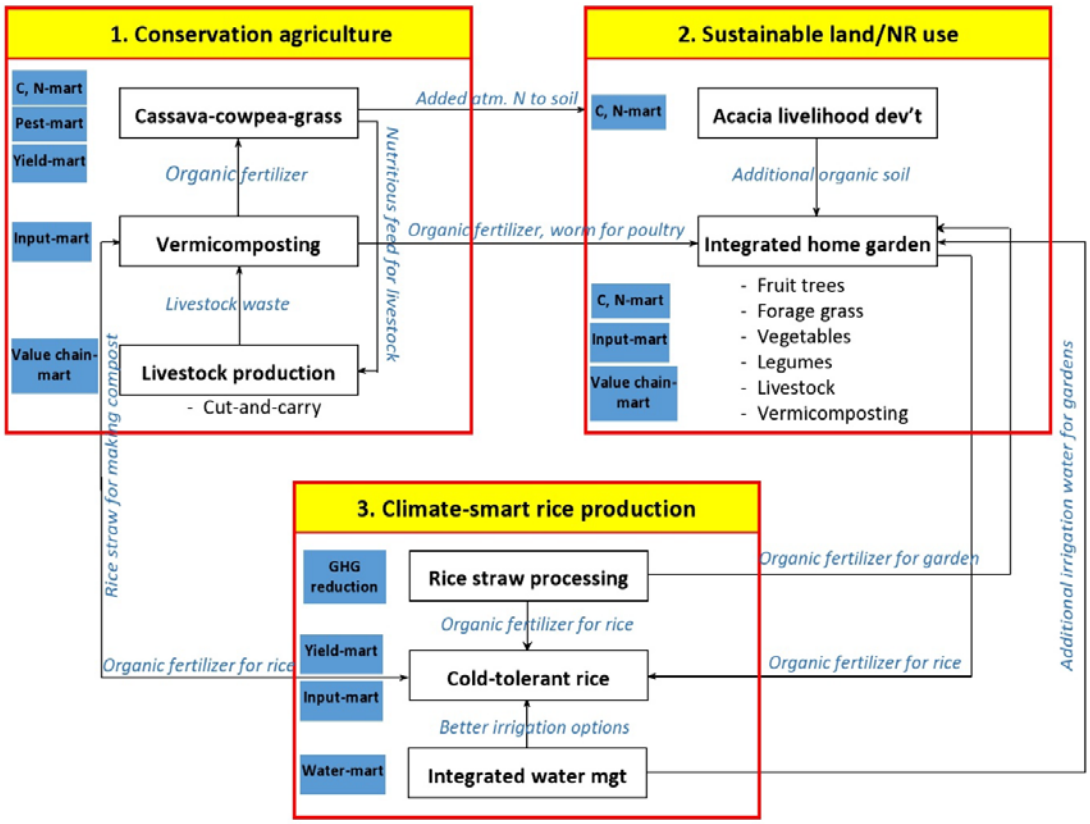
(about 25 ha). All the agricultural land area is allocated to 176 households for use and management. On average, each household has a land tenure of 0.68 ha. In addition to this land, during the dry season, when the water level in Thac Ba lake is low, Ma villagers also grow some annual crops in the land areas along the lake sides (Cos land). The total area of this land is 1.5 – 2 ha depending on the water level. The main crops cultivated here are groundnut and various vegetables. Villagers use Thac Ba lake (about 500 ha) for aquaculture and fishing (Sen et al. 2014).

Photo 1. Lowland and upland areas of Ma village.

In order to track research progress and achievements, ensure the production of planned deliverables and outcomes of the project, and learn from the experiences, a M&E plan was designed early in 2015. This M&E plan has two broad dimensions: a more technical one that deals with the biophysical research results and a more social one that deals with how they key actors involved in the research experience progress, costs and benefits, achievements and challenges. The more technical side is carried out by the CIAT-Hanoi led research team, while for the more social side the support of CGIAR partners is mobilized. For the biophysical research the CIAT-Vietnam

team in Hanoi developed an original analytical framework that depicts how the selected technologies interact and impact on climate change adaptation (Figure 1).

Figure 1. The Ma village climate-smart agriculture framework



Source: Bui Vinh Le (CIAT-Hanoi)

A first M&E field mission focusing on the social side to Ma village took place on the 24th and 25th November 2016. The mission aimed to assess: the progress of the CCAFS flagship activities in 2016 based on its annual operational plan; the practical application and the scaling up potential of the introduced technologies; and to evaluate the initial and potential impact of the project activities on Ma village and beyond. The mission was designed according to the overall M&E plan developed for the "Integrated agricultural technologies" project (Vernooy and Bertuso 2015). The mission aimed to answer the following monitoring questions:

- Are project activities on a good track? Have project milestones been reached? If not, what is the reason/are the reasons?

- Are the introduced CSA technology relevant to the village and what is the adoption potential of these practices in Ma and beyond?
- In which ways is the collaboration between researchers, technical staff and farmers evolving? Are women and men farmers actively and meaningfully involved?
- In which ways are intermediate research results and experiences shared, inside the CSV village(s) and with outsiders?

Methodology

Key informant interviews

Face-to-face interviews with key individuals were carried out using semi-structured questionnaires (see Annex 1). The informants are farmer cooperators who are directly involved in the testing of one or more CSA options (some of them are trying out up to six CSA options); CCAFS project staff (field staff and manager); local authorities (village leader, commune chairman, staff of local mass-organizations, and the extension service). The aim of the interviews was to capture the perceptions and attitude of participating partners, especially local partners, about introduced the research underway and the introduced CSA technologies in particular in Ma; obtain their individual assessment about the relevance, the effectiveness/benefits and the adoption potential of these novel technologies and an idea of the first impact at household and village levels; as well as some suggestions for possible improvement of the research and selection of the CSA options.

In total, 13 individual interviews with farmer cooperators were held (50% of all the directly and actively involved farmers in the CCAFS project) comprising 9 women and 4 men; 3 interviews with local officials done (make village leader, male farmer union chairman, and female officials responsible for land-use and economic development) and 4 interviews with male project staff conducted. Interviews with farmers and local stakeholders were conducted in Vietnamese and without the

presence of project staff. Each interview lasted between 30 and 45 minutes. Interviewees were selected from the list of experimenters representing all the CSA options being tested. Interviews were held at the village meeting hall. One limitation of this venue was that the actual experiments could not be observed.

Photo 2. Interview with ma village farmer.

Focus group discussion

One focus group discussion (FGD) with a group of non-project farmers (four women and one man) was carried out to obtain their opinions and assessment about the project activities from the point of view of a non-participant in the project CSA testing activities. Non-participation does not imply that the farmers are not aware of the project activities. In fact, they might sometimes attend project meetings and be informed about project activities (for example, through the village notice board and morning news loudspeaker system), but they are not testing any of the novel CSA practices and technologies. FGD questions included whether they find the tested CSA technologies relevant to the village; whether they would adopt these practices in the near future; any change that they have observed in the village as a result of the project activities and any suggestion they would make to enhance the relevance of project activities and increase the adoption potential of introduced CSA practices. The FGD

was also held at the village meeting room; one of the technical project staff was present to take notes of the discussion. The farmers for the FGD were invited by the village leader. This may have coloured the selection process to some degree, but the purpose was not to have a statistical representative group of non-participating farmers; rather to obtain some initial feedback from non-participating farmers.

Photo 3. Focus group discussion.

Some additional information was obtained through field observations in the village and during the so-called photo voice event that was organized at the same time in Ma village by the CCAFS Southeast Asia programme. The photo voice event gave Ma farmers the space to present their own views on becoming a climate-smart village by means of self-made photographic reports or posters. Prior to the event a small group of women and men farmers were trained by the CCAFS team in the basic principles of photography and given a small camera for a short period of time. The photographic reports highlight farmers' views on and experiences with the testing of novel CSA technologies and practices in Ma village.

Monitoring results

Project progress

Informants agreed that according to the provided operational plan, to date the project activities have been implemented well and there is good implementation progress. Six CSA technologies and practices are being tested either as a single on-farm intervention or in combinations (two or more combined), with newly formed, informally organized groups of farmer cooperators. Several additional options are planned to be implemented in the coming season, for example the testing of stress tolerant rice (to respond to changes caused by climate change) (see table 1). For each tested technology or practice, a farmer interest group has been established to provide a learning platform for farmers to exchange their experiences and knowledge about the practices they participate in. In total, 28 households are participating in testing introduced technologies/practices (14% of the total village population). Most of the testing households are implementing two or more practices, one household implements six practices. In some cases, households joined a particular group after some time; thus not as initial experimenters, but more as early adopters. Data about the use of the bio-stove were hard to obtain as farmers expressed not much interested in this option.

Table 1. CSA technologies and practices being tested in Ma in 2016

N^0	CSA technologies and practices	No. of participating farmers
1	Integrated home garden management	3
2	Integrated crop management on rice (introduction of new management practices on in rice cultivation)	7
3	Rice straw processing	6
4	Cassava-forage-cowpea	3
5	Living bed for chicken production	10
6	Vermicomposting	6
7	Bio-stove	No data
8	Testing of stress tolerant rice variety (starting in 2017)	1

All farmer interviewees expressed that there were no notable difficulties during the implementation of activities in the village. Local leaders and project staff on the other hand expressed that in the beginning they had to invest considerable time and effort to invite and convince farmers to participate in the testing of the selected options. They mentioned that farmers initially had some doubts as the immediate benefits could not be seen that easily.

Relevance and the scaling out potential of introduced CSA options

All six introduced technologies and practices were evaluated by all interviewees as relevant or very relevant to local conditions. Very relevant are: integrated home-garden management; living bed for chicken raising; vermicomposting; and rice straw processing. According to interviewees, the high level of suitability of the tested CSA options has been due to: their high level of practicality that addresses the existing issues in the village; easy to be managed by farmers, inputs are available and their benefits can be easily seen (the latter is interesting given the initial reluctance of farmers to test the selected options). It seems therefore that these practices have a high adoption potential. However, in order to enhance the adoption of any tested practice, a detailed cost and benefit analysis should be carried out together with farmers.

Some interventions are considered good options, but have a small number of constraints that could limit their out-scaling potential, e.g. cassava grass strips are limited by the current unstable market price of cassava and availability of cattle, sustainable rice intensification is limited by water availability in some areas of Ma, the bio-stove does not seem to respond to the particular cooking needs of households at this moment in time. A number of farmers were interested only in a part of an introduced technology, such as the case of the cassava-grass strips-cowpea mix. Some of the interviewed farmers stated that they are only interested in the fodder grass component of the system as it can be planted in different part of the farm for animal feed. The project implementation has been carried out with a high involvement of women: 65% participating farmers are women. Responses of women and men did not indicate differences in perception and attitude. They were all very positive.

The motives of farmers to participate in testing of the introduced options were that the interventions addressed the problems they face in daily farming activities, such as

land degradation, bad smell due to the presence of fresh animal dung, availability of abundant "waste" of timber processing; lack of knowledge about improved farming practices as well as their believe that the introduced practices would be more efficient, bringing more benefits and better income to households. One of the motives mentioned by some interviewees was the material support offered by the project.

Collaboration and participation

All interviewees evaluated the cooperation between project partners as very good. They expressed that farmers and local partners are enthusiastic, the field researcher was devoted to the work and become truthful to and beloved by local farmers. They stated that local leaders at commune level are well informed about the project activities and appreciate their implementation. The village leader is active and shows good leadership. From the interviews it became evident that he obviously has a strong voice in the village. The scores of the ranking exercise carried out individually by interviewed women and men give a more detailed overview of which elements are appreciated to what degree (note that one of the interviewed women farmers did not fill in the table).

Table 2. The quality of collaboration and participation in Ma village

WOMEN FARMERS (n=8)	**0**	**1**	**2**	**3**	**4**	**5**
Working on the experiment is done in harmony and good mood.				1		7
We are researching technical as well as other aspects related to the experiment such as nutrition, health and income.				2	4	2
Farmers' knowledge and experience is taken seriously.				1	2	5
The experiment is producing results that are useful for farmers, technical staff and researchers.					2	6
The experiment allows to learn about how to do research together with technical staff and researchers.					2	6

0 = Fully disagree; 5 = Fully agree

MEN FARMERS (n=4)	**0**	**1**	**2**	**3**	**4**	**5**
Working on the experiment is done in harmony and good mood.						4
We are researching technical as well as other aspects related to the experiment such as nutrition, health and income.					1	3
Farmers' knowledge and experience is taken seriously.			1	1	2	
The experiment is producing results that are useful for farmers, technical staff and researchers.					1	3
The experiment allows to learn about how to do research together with technical staff and researchers.					2	2

0 = Fully disagree; 5 = Fully agree

Ways of technology dissemination

Farmers to farmers: Beside of sharing knowledge and experiences with other farmers in the CSA testing groups, participating farmers showed their willingness to share and train others to apply the introduced practices. Some of them had shared what they have learned to their relatives and friends inside and outside the village. A number of farmers have adopted through this way of extension, as mentioned by farmers interviewed. However, the exact number of adopters has not been recorded.

Cross visit and project event: A number of cross-visits for farmers inside and outside the village have been organized. Farmers also considered these visits an effective way to disseminate information to farmers especially to those outside the village. Some events organized by the project such as the photo voice allowed representatives of other villages and communes to "see for themselves" about what is going on in Ma village.

Extension materials: Farmers mentioned that the like to receive more and better technical guidelines in form of leaflets or posters that they can use themselves or distribute to others.

Initial and potential impact

To assess the initial impact of the project activities, interviewees were asked to separate the initial project impact at to two levels: household and village.

At household level

Some of the interviewed farmers reported about an increase in income from: chicken raising (chicken grow better due to better health); reducing production inputs cost (vermiculture provides worm for animals, straw and dung composting provides organic fertilizer); integrated home-garden management diversifies and increases income due to better nutrient recycling. The farmers implementing living bed for chicken and composting emphasized the health benefits of having better hygienic condition from reducing the bad smell of animal dung. They also pointed out that with the introduced CSA practices their resources were used more efficiently due to better nutrient recycling within farms. Waste of farming and domestic activities has been

used to produce organic fertilizer and raise worms which then can be used as inputs for their crop and livestock production.

Women and men interviewees expressed that through hands-on training activities their knowledge of farming techniques has been enhanced. They also observed that interactions with other farmers and outsiders during trainings, discussions, presentations have made farmer become more confident when talking in front of people. This is likely an intended result of the project, but nonetheless one of significance. It can be seen as a small step of empowerment.

At village level

Considering the implementation of the six CSA options together, some intermediate impacts have been generated by the project. Interviewees frequently mentioned the following ones. As a result of rice straw processing and cattle dung composting, the roads in the village are no longer polluted. Hygienic conditions in the whole village have been improved as bad smell from straw burning and animal production has been reduced considerably. Burning rice straw after harvest is the common practice of farmers in many rice production areas in Vietnam leading to air pollution and loss of carbon stock/organic matter. The non-burning practice could potentially resolve a national-wide problem and reverses organic matter to the soil if its application is widely promoted. As observed, farmers in Ma village are willing to process rice straw as they observe direct benefits. The same approach could be implemented elsewhere.

In Ma village, waste from timber processing (a major economic activity in the village) is a very serious environmental issue. Now some farmers are using part of the waste for livestock production and composting. If adopted large scale, the impact could be very significant. Farmers also mentioned that the free grazing of animals has been reduced as farmers are planting more fodder grass using free areas in their home-garden and farm.

The weather forecast in every morning by the village leader has made the villagers better prepared for their farming activities. Through the group and community activities organized in the village farmers talk and share more with each other and this is contributing to more village coherence –a precondition for collective action.

With better resource use, efficient nutrient recycling within the farm, diversifying farming activities including the livestock component, the set of CSA options can potentially increase the income and the resilience of the agricultural production system. The set of these CSA practices could potentially be extended to other villages in the communes and beyond as suggested by local leaders during interviews.

Key success factors

All interviewees reflected that the relevance of CSA practices is one of the key factors leading to success. The introduced practices are practical, easy to be used by farmers and address existing issues of daily farming activities. The approach of introducing and testing the CSA practices also matters a great deal. Learning by doing and follow-up by frequent visits and technical support from the field staff, sharing knowledge and experiences through learning platform/farmer interest groups, is enabling women and men farmers to master techniques easily while they feel confident to share their new knowledge and skills with others. Women in particular have taken on a key role; perhaps because they can see and access direct benefits of importance to them and their family.

Good cooperation among project partners and strong leadership of the village leader are two other factors contribute substantially to success. The market can play a vital role in uptake of options. However, in the case of Ma, the current low price for cassava obviously limits the adoption of the cassava-grass strip-cowpea system. Farmers' interest to shift to producing fast growing tree species with good market potential is driven by the same market force. How climate smart such a shift is remains to be seen. Another factor of importance is policy support from the

government. Integrating CSA in the agricultural development policy of the village, commune, district and provincial level could help promote the wide scale application of the CSA practices, generating impact at landscape level. Interviewees expressed that to date government support has been very modest.

Suggestions for improvement

The CCAFS programme at large and the project in particular do not yet have developed a strategy to carefully record the number and type of technology adopters at village level and beyond. This is a serious weakness given that the number of farmers that will benefit from CCAFS CSA activities is one the CCAFS CSA programme impact indicators. Even at village level, there is uncertainty about the number of adopters. Most of the interviewed farmers mentioned that they know about new adopters, but it was difficult to obtain a precise number.

Farmers in the village seemed not very well informed about the research objectives of the project activities and are not engaged in the measuring of results in any systematic way, on their own and/or with the support of the research team. It seems that they consider what they do as demonstration. This is not totally a surprise given that in Vietnam this is the dominant mode of technology development. However, this operational mode limits the production of research results and constrains learning in some ways. Regular monitoring observations and measurements would give the research team more solid evidence to test the hypotheses that underlie the research interventions. Given that Ma village is a CSV pilot site, building up such solid evidence base is very important for the CCAFS programme. Involving farmers in measuring ecological, agronomic, economic, socio-economic, health, nutrition results will also allow for a critical assessment of the costs and benefits of tested options. Third, involving farmers in the monitoring (and evaluation) is another way to empower them by giving them more voice in the research process.

Some interviewed farmers mentioned that they lack proper technical support and farmer friendly materials with regard to each introduced practices. Providing farmers with such support could make them more confident disseminators of information, teachers of good practices, and extension agents.

Conclusion

Almost one year after start up, the activities of the project in Ma village are on a good track. From the interviews a general observation emerges that most of the introduced CSA practices are well interrelated and relevant to local conditions. They address practical needs of the local community while being climate smart in a several ways. The adoption of these practices could potentially increase efficiency of resource use within the farm through better nutrient use and recycling contributing to increased farm productivity and income of households. The use of agricultural and domestic waste and waste of timber processing as inputs for composting improves the hygienic conditions at individual household and village levels, addressing environmental pollution and enriching the soil with organic matter.

As the introduced practices are practical and manageable by farmers, their adoption potential appears high. However, in order to promote wide-scale adoption of these practices, a well-thought out-scaling strategy should be designed and implemented. This could include the strengthening of the existing government extension network as well as by developing a much stronger farmer to farmer learning and extension network. Farmers seem quite keen and very capable to become farmer extension agents. The role of the market merits more attention concerning the provision of inputs (e.g. quality seed/seedlings, microorganism for composting) that contribute to CSA technologies and the sale of local products that can add value to CSA technologies.

Regarding the policy aspects, there is a need to better demonstrate how tested CSA options generate private and public benefits, the latter which could be incentive in

some way. This will require working much more closely with policy makers to put CSA higher on their agendas and design and implement truly supportive policy measures.

Appendix: interview guides

Interview guide for local authorities (extension service, mass organizations, Department of Agriculture and Rural Development, Communist Party officials)

1. Are you familiar with the activities of CCAFS flagship project in Ma village? Which activities are being implemented in the villages?
2. Which of these activities do you think, are relevant to Ma village and why?
3. Which of these activities are effective and how can we measure this? Which are not and why?
4. Comparing year 2014 (no CCAFs intervention yet) and now, what changes have you observed in Ma village? Who are experiencing these changes? How significant are these changes? Are these changes sustainable? In what ways the CCAFs intervention has contributed to these changes?
5. Have CCAFS activities changed the participation of women and contributed to gender equity?
6. In the last year, are there farmers in Ma village who have adopted any of the introduced technologies themselves without project support?
7. What are the difficulties that have arisen while implementing the CSA technologies and practices?
8. What need to be done differently to improve the project implementation?
9. What can be done to promote adoption of the relevant activities? Who can do what?
10. What do you think still needs to be done/other activities to make Ma village a climate smart village? What role do you see for CCAFS?

Interview guide for the farmer co-operators in the CSV

1. How long have you been a farmer cooperator in the CSV?

2. What was your motivation to become a farmer cooperator? What were your expectations as a farmer cooperator?
3. What changes have you made as a result of being a farmer cooperator?
4. What changes have you observed in your household so far? In the case of a collective action intervention, what changes have you observed in other participating households
5. What changes have you observed in Ma village since the CCAFS activities began? Who are experiencing these changes? How significant are these changes? Are these changes sustainable? Are the changes really due to CSV activities?
6. Did you modify the original design of the introduced CSA to fit in with your household conditions?
7. Did you face any difficulties while implementing the CSA practices?
8. Will you continue applying this CSA in coming years? Why?
9. Are you interested to try other interventions related to CSA?
10. Do you share your experience with neighbors or relatives? How?
11. Do you think other farmers are interested in the practice you are applying? Inside Ma village and outside the village?
12. What other practices you would suggest to be implemented in Ma village to make it a more climate smart village?

Interview guide for field staff responsible for implementation of activities

1. How do you assess the activity/project progress to date? At household level? At village level? Is the activity being carried out as scheduled? If not, what is the reasons/are the reasons?
2. Do you face any difficulties/challenge during the implementation? Why?
3. Do you think the activities are relevant to Ma village? For women? For men?
4. How you evaluate the behavior of local farmers toward the introduced practices? How do you explain this behavior?
5. Have you observed any farmers who adopted any of the new CSA practices on their own?
6. What do you think of scaling up potential of these introduced practices and what the project could do to improve the adoption?

7. Do the local authorities plan to include the introduced CSA practices in their socio-economic development planning (village planning)?
8. What other activities you would suggest to be added to the existing CSA practices that have high adoption potential?

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Research supported by:

CGIAR Fund; Australian Government Australian Centre for International Agricultural Research; Irish Aid; Ireland's commitment to a world without poverty and hunger; Ministry of Foreign Affairs of the Netherlands; New Zealand Ministry of Foreign Affairs & Trade Manatū Aorere; Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra Swiss Agency for Development and Cooperation SDC; UKaid from the British people; USAID From the American People; IFAD