

Using a gender lens to explore farmers' adaptation options in the face of climate change: Results of a pilot study in Uganda

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

*Florence Birungi Kyazze,
Brian Owoyesigire,
Patti Kristjanson,
Moushumi Chaudhury*



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



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CCAFS Coordinating Unit - Department of Agriculture and Ecology, Faculty of Life Sciences, University of Copenhagen, Rolighedsvej 21, DK-1958 Frederiksberg C, Denmark. Tel: +45 35331046; Email: ccafs@life.ku.dk

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ABSTRACT

Uganda, and especially the Rakai district, is highly vulnerable to climate variability and likely to be amongst the worst hit under climate change. Any responses to climate change affected communities cannot be considered complete unless women-specific responses are interwoven in a variety of adaptation options considered in the target area. The overall objective of this short-term research was to test tools and methodologies developed by CCAFS and FAO on analysis of gender issues in climate change, agriculture and food security. The study took place from the 1–4 November 2011, in the village of Kyengeza village in Uganda.

We found that farmer-to-farmer visits to ‘climate analogue’ sites could indeed help farmers learn about potential adaptation options/changes in farming practices that they may want to consider in the face of more variable weather conditions and a changing climate in the longer run. Men and women do seek information on agricultural practices being pursued in other locations, and young men in particular are quite mobile and actively seek market information. However, women face more constraints to seek out agricultural information due to lack of mobility caused by cultural restrictions that prevent taking certain transportation or lack of approval from husbands. Women also may not have time since they have commitments at home.

With respect to availability, access to and use of daily and seasonal weather forecast information, it turns out that the most common source of weather information is indigenous knowledge. Radio and mobile phones are secondary. Women find daily weather forecasts valuable for planning post-harvest activities, ensuring water harvesting for domestic use, and for timing of gathering fuelwood. But over 80% of the men, women and youths participating in the discussions did not trust or had lost interest in weather forecasts broadcast over the radio or mobile phones mainly because they perceived it as being unreliable and not location-specific.

In exploring various climate smart interventions and opportunities that are being pursued by the different group members, farmers in Kyengeza district use a variety of techniques. Men are more likely to use mulching as a method for soil and water conservation compared to women, since mulching material has to be purchased off-farm, which is easier for men. Men are also more likely to use inorganic fertilizers for enhancing soil fertility than are women, also because it is obtained off-farm. However, men and women are equally involved in crop management techniques such as intercropping,. The study suggests that the majority of farming techniques being taken up are primarily aimed at helping households adapt to the various changes they are faced with, including a changing climate. They also aim to enhance food security and increase income. However, there is very little action taken to explicitly mitigate greenhouse gas emissions through farming. Very little contributes to mitigation. Various types of organizations are encouraging farmers to adopt new farming practices. A combination of private and public institutions, for example, provide training on planting trees, what types of improved seed varieties to use, how to water harvest and integrate crops and livestock.

Keywords

Climate change, gender, food security, climate analogues, weather information, climate smart agriculture, Uganda

About the authors

Dr Florence Birungi Kyazze is a lecturer in the Department of Extension and Innovation Studies, Makerere University. She lectures on statistical methodologies, social research methods, program development, gender and evaluation. Florence has also worked with the National Cereals Program as a senior social scientist where she conducted extensive research in gender, value chain analysis, curriculum development, community mobilization, and participatory approaches. She is also a senior advisor and researcher for Women's Initiative in Development and Para-legal Activities Association and a member for the **Association for International Agricultural and Extension Education** (fbirungikyazze@agric.mak.ac.ug).

Mr Brian Owoyesigire is a livestock scientist in the National Agricultural Research Organization (NARO) based at Buginyanya Zonal Agricultural Research and Development Institute (BugiZARDI). Brian conducts livestock research in Uganda's south-eastern agro-ecological zone. He is currently a graduate fellow at the International Livestock Research Institute (ILRI) in Nairobi, Kenya and is affiliated to the People Livestock and Environment (PLE) theme, where his research interest is in vulnerability mapping of the pastoral production system to climate change and variability by application of remote sensing techniques. Brian has also worked as an Animal Production Officer in a NARO project and with various pastoral communities in the cattle corridor of Uganda to devise appropriate strategies to improve livestock water productivity (bowoyesigire@agric.mak.ac.ug).

Patti Kristjanson is an agricultural economist and research leader of with the CGIAR Research Program on Climate Change, Agriculture and Food Security (www.ccafs.cgiar.org). CCAFS, based at the World Agroforestry Centre in Nairobi. Her expertise includes poverty and livelihood analyses, impact assessment, agricultural system analyses and innovative research approaches for linking knowledge with action. She has 25 years of experience leading and managing multidisciplinary teams from international and national agricultural research centres, in collaboration with universities, donors, private and public sectors across Africa and Asia (p.kristjanson@cgiar.org).

Moushumi Chaudhury is a social scientist and science officer with CCAFS. Her research focuses on developing approaches, tools and strategies aimed at enhancing linkages between the knowledge co-produced by researchers, farmers, community organizations, development practitioners and others, and actions that lead to sustainable agricultural practices that enhance livelihoods and resilience to a changing climate. Her expertise and experience includes conducting research and policy analysis on climate change adaptation and mitigation, early warning systems, renewable energy, ecosystem services, and gender for various international research and development organizations. She can be contacted at: M.Chaudhury@cgiar.org.

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LIST OF ABBREVIATIONS AND ACRONYMS

CCAFS	CGIAR Climate Change, Agriculture And Food Security
CEDO	Community Enterprises Development Organization
CGIAR	Consultative Group On International Agricultural Research
CIDI	Community Integrated Development Initiative
CSA	Climate Smart Agriculture
DATIC	District Agricultural Training And Information Centre
DFID	Department For International Development
FAO	Food And Agriculture Organization of the United Nations
FGD	Focus Group Discussion
ICRAF	World Agroforestry Centre
ILRI	International Livestock Research Institute
ITK	Indigenous Technical Knowledge
LPP	Livestock Production Program
NAAD	National Agricultural And Advisory Services
NARO	National Agricultural Research Organization
NGO	Non-Governmental Organization
PLE	People Livestock And Environment
RACA	Rakai Counsellors' Association
SMS	Short Message Service

2.0 Climate Analogues

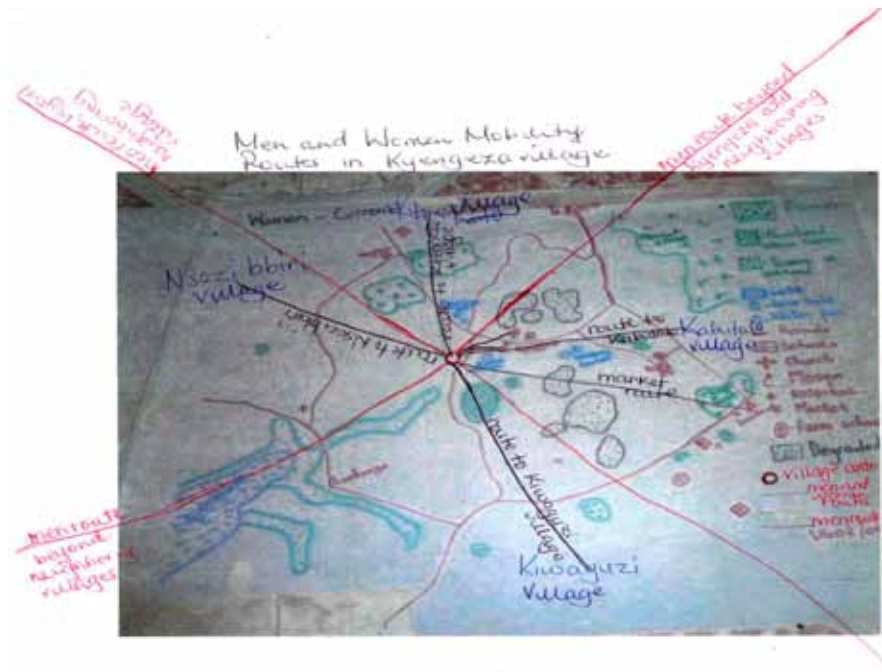
2.1 Introduction to climate analogues

The analogue approach is based on the idea that a projected rise in temperature in one cool area (A), will make it resemble a warmer currently existing location (B), whose climate might also be transformed in the future into another (C). By studying analogue sites we can understand how the future for a specific location might look like, which actually might allow testing climate-adapted cropping systems and technologies and provide the opportunity to learn from others' experiences through sharing knowledge and exchanging information. The objectives of the climate analogue session therefore were:

- i. To understand the extent to which different types of farmers are mobile (or not) and generate insights on if, what, and how they wish to learn from visiting climate analogue sites. To better understand how the use of other information and communication technologies (e.g. films (e.g. short UTube Videos, cell phones) may be ways in which to effectively share knowledge about what people are doing now in places with similar future climates for these different groups.
- ii. To test the usefulness of gender-differentiated participatory resource maps (in this case, already available) in helping to enhance understanding of the potential of using the climate analogues tool in potential action research.
- iii. To better understand the factors helping and hindering male and female farmers in learning from others about adaptive strategies for dealing with climatic uncertainties.

2.2 Methods

A village resource map (see Map 2 below) was used to stimulate the discussion and introduce the climate analogues session. This map had already been drawn by farmers from Kyengeza village during baseline studies conducted by CCAFS. Information was captured from the participants with the use of guiding questions suggested in the FAO-CCAFS gender and climate change training document. Men and women groups were separated. Each group had a facilitator and note takers to record all the information required.



Map 2: Village Resource Map

The gender-disaggregated resource maps were very useful in discussions of the potential of farmer-to-farmer exchanges, capturing issues of mobility, particularly in estimating the distances to the places visited. Separation of men and women enabled full participation of all issues pertaining to specific gender categories. Men and women were able to share information without any fear or intimidation. CCAFS should endeavour to produce large resource maps that are visible rather than the A-4size maps if these are to be useful in future seminars.

The reporting guides were very useful in assessing the most important information for the climate change analogues session. Other tools that would have been useful for this exercise could be (i) the seasonal calendar – this tools would have been handy to generate the time of the season when men and women are ready to move from one place to another; (ii) the daily activity clock –this tool would have been useful to generate information on the time of day when both men and women would be more ready to travel to other places.

2.3 Areas men and women travel to and reasons for their travels

Men and women usually travel to areas within and around Kyengeza village. The surrounding villages they travel to and their distances to Kyengeza are given in Table 1 below.

Table 1: Name of surrounding village and their relative distances from Kyengeza

Village	Distance from Kyengeza village (miles)
Nsozi Bbiri	3
Kitonezi	2
Kabutale	1
Kiwaguzi	1

Men are able to travel more frequently but women participants said they travels usually once or twice in a month. Nevertheless, their movements to nearby places like fields and watering points occur on a daily basis.

Participants move to various places for a number of reasons, including:

- To buy essential commodities that cannot be accessed from nearby trading centres and market places. Respondents reported that men are more likely to visit markets (60% of men visit markets) compared to 30% of women.
- To sell farm produce and other items in trading centres at relatively better prices than they would get in Kyengeza.
- To cultivate their gardens that are located in neighbouring villages e.g. Kiwaguzi and Nsozi Bbiri.
- To see how their neighbours prepare their gardens and manage crop fields especially those who grow tomatoes.
- To look for better schools for their children, especially as they get older.
- To attend development training.
- Men and women travel long distances to referral (public) hospitals, particularly for complicated cases, since the majority cannot afford expensive private hospitals.
- Men and women visit markets, water sources, worship centres, relatives and health centres. The majority go to markets to buy clothes.
- It was also reported that men travel to buy improved agricultural seed.

Men noted that individuals who own mobile phones rarely move to other places to look for information. Instead, they call colleagues to get information to guide them in making decisions on agricultural enterprises. The men's group also noted that they have received text messages about markets and prices on several occasions on their mobile phones. The only complaint they have is that the packaging and language of the message is limiting. The information is sent in English and not in the local languages.

Men noted that they and their family members travel mostly during harvesting periods of the year and this is usually in the months of June, July, December and January. This implies that if any CCAFS activities are to be planned in future, they should not coincide with these months.

For women there is no specific time of the year for travelling. One woman, however, indicated that she prefers travelling during weeding time and others pointed out that the month of June is the best time to travel if one wants to look at how crops are growing in other villages. Furthermore, if a farmer wants to buy farmland in another village, he/she will visit an area during the dry season to see how crops like coffee and banana look like on that land. They base this on their general belief that the quality of the soil in a field is determined by its ability to sustain annual crop like bananas in good condition. Regarding the best day of the week for travel, the women noted that Saturday was preferred since school-going children can be left to take care of chores in the homes.

2.4 Types of information that men and women search for while travelling

The specific types of information that participants look for from other places include: agronomic practices like crop protection, soil and water layout; crops grown in other areas to minimise competition; marketable crops; existing/potential markets for produce, improved seeds and livestock breeds, and treatment for livestock. They generally noted that they would like to get information on climate change adaptation and mitigation strategies that other places are already using.

The type of information shared when they visit other places is mainly on the type of crop on the market and agronomic practices. It was noted that it is mostly the young men and adult males who yearn for market information and also move to other places to learn about new agronomic practices. The participants attributed this to energetic nature of young men's ability to travel long distances and also the need for market information to support their agricultural enterprises. It was also noted that the need to improve quality of their produce and keep record of the changes in agricultural practices triggers men's travel from Kyengeza to other places. The men noted that they have been able to learn some new things when they visit other villages. Among these are; mulching of banana plantations, construction of water trenches and use of inorganic fertilizers.

The participants reported that majority of the elderly people (80%) are not always willing to share agricultural-related information they received from other places with others unlike, young men who were reported to freely share information. It was also noted that the elderly are more interested in less labour-intensive crops (e.g. banana, beans and coffee) mainly for food security and subsistence incomes, while young men were more interested in tomatoes. Furthermore the relatively young males noted that they are always willing to adapt to the changing demands of agriculture if they are to survive, unlike elderly men.

2.5 Factors limiting mobility

Although the women are able to travel to these areas, they face a number of hindrances. Some of the limitations include:

- High transport costs.
- Road obstruction by crossing cattle (Rakai is in the cattle corridor).

- Lack of nearby water sources.
- Poor roads that are dusty during the dry season and slippery during the rainy season.
- Hooliganism and robbery along the way, especially for those who come back when it is already dark. The situation is even worse for ladies.
- Poor health of the elderly keep women home.
- The women's household responsibility of taking care of the home and the young children limits their movement.
- Based on observation during the focus group discussions that took place on a rainy day, men were wearing gumboots while women wore ordinary shoes. This depicts the depth of the mobility problem for the women on a rainy day.
- Women are sometimes restrained from making these travels by their husbands.

Women's mobility is determined by men granting them permission to travel. The men reported that they had no problems with their wives travelling to other places as long as there was prior information and mutual agreement on the purpose of travel. The men noted that they always encourage their wives to go for meetings where invitations are official. This implies that in case of any future sensitisation seminars, official invitation letters can help in ensuring full participation of women. The above hindrances imply that if any exposure visits or sensitisation seminars have to be organized, then they should take into consideration the hindrances of travelling for both men and women.

It was also noted that people who travel from Kyengeza to other places used bicycles as the major mode of transport. Over 60% of the community members used bicycles to travel to other villages. While men rode the bicycles themselves, women usually rode on the back if there was a man to take them around. Thirty percent (30%) walked and 10% used motorcycles. It was emphasized that majority of men go by foot whereas women are helped or are made to pay to use bicycles and motorcycles since cultural norms bar them from riding bikes or motorcycles. This means that women are limited to travelling to nearby villages where they can go by foot. Distant places where the men use bicycles impose an extra cost to women who have to use the costly motorcycles.

2.6 A comparison of conditions in Kyengeza to those in neighbouring villages

Both men and women pointed out that there are a number of differences between Kyengeza and other neighbouring villages in terms of weather, type of vegetation cover, soil quality, farming practices employed, farmer integration, household utilities, sanitation and crop varieties grown. They noted that apart from Nsozi Bbiri, villages like Kinoni, Kitonezi, and Mpologoma have better weather conditions with more frequent rains in addition to better soils, higher vegetation and swamp cover. In contrast, Kyengeza is a deforested area with swamps that have been reclaimed for farmland.

Both men and women also noted differences in farming practices carried out in the villages they visited. They indicated that most crops such as beans, maize, coffee and bananas are planted in the same way but their management differs significantly. They pointed out differences in soil and water management through practices such as mulching,

agroforestry, fertilizer application, use of manure, building of trenches and irrigation in many of the surrounding villages. They said that farmers in the other villages cultivated improved crop varieties and carried out activities like kitchen gardening, which is not common in Kyengeza.

Both men and women also noted differences in farmer integration in the various villages they visited. Unlike those in Kyengeza, farmers in neighbouring villages were organized in groups under which they carried out farming and marketing activities. They mentioned that the reason for this kind of integration and improved farming practices is the presence of many NGOs in those areas. This implies that there is a gap in extension services provided in this village and the expansion of these NGO activities through CCAF's efforts would bring about change in the area.

Apart from the differences in farm-related activities, the respondents noted that individuals in neighbouring villages also had improved household utilities like the energy-saving stoves, "sun tables" and wells for each household.

Villages like Kabutale were noted to be worse off than Kyengeza because of the poor soils despite receiving sufficient rainfall. Both men and women concluded that if deforestation, swamp reclamation, poor crop management, pests, weeds and drought persist in the area, Kyengeza could turn out to be like Kabutale.

There is potential for those in Kyengeza to learn from their neighbours if trips to analogous villages could be arranged. There are cases where men and women have learned adaptation techniques from places they have visited. Some men noted that they have started planting trees and adapting better soil and water management strategies to make sure that they have enough food in the future. A good number have started planting early maturing and drought-resistant varieties in addition to planting throughout the year.

Of the 14 women, only two have tried to practise some new technologies they learnt from the surrounding villages. However, out of these farmers, only one was successful in implementing the technology. The successful farmer gave the focus group a detailed process of producing clonal coffee seedlings and also said that she did this in order to earn more income from the improved coffee variety. Mobility of farmers could, therefore, have a role to play in bringing about innovations in Kyengeza village supported with streamlining the spread of new farming techniques.

2.7 Analysis of information gathered from both men and women

It was clear from the discussion that farmer-to-farmer exchanges can be useful to the respondents to protect their family's ability to produce and eat enough food in the future. This is because some participants said that they have changed the way they are farming because of lessons learnt from other areas. It was also clear from the discussion that participants cited some examples of progressive farmers involved in coffee and banana production who have learned and adopted a number of practices from other areas such as Masaka and Mbarara.

It was noted from the discussions that farmer-to-farmer exchanges can be very beneficial to women, the youth and men who are not too old. The exchanges can be in form of day long tours to other villages or places where new adaptation farming techniques have been implemented for some time with clear signs of progress. Given the fact that lessons to be learned exist in distant places, transport has to be provided to both men and women. The other critical consideration is the fact that the theme of the visit has to be diverse

and well-balanced to generate interest of both men and women (i.e. showing farms that provide food security and income).

All men and women below the age of 50 would benefit from farmer-to-farmer exchanges since their main occupation is agriculture, and to them, any strategy towards improving their farms is highly welcome. The hindering factors of mobility are mainly: cultural barriers that prevent women from riding bicycles and motorcycles; husbands not giving permission when there is no official invitation; long distances to places of interest; and bad roads especially during the rainy season. The enabling factors for women to be mobile are: provision of affordable transport; short distances that would allow them to walk; and official invitation to meetings. The enabling factors for men to be mobile would be: provision of bicycles and motorcycles since they are not barred by cultural norms. These however can be provided to a few who can communicate the message to others.

- The types of villages which are conducive to information exchange are those that:
 - * Have adopted farming techniques and there are signs of success despite the changing conditions.
 - * Are engaged in tree farming (including agroforestry since majority of people in Kyengeza have small land sizes).
 - * Are engaged in low-cost soil and water management (i.e. communities involved in low cost rainwater harvesting for domestic use and small scale irrigation).

² N/A refers to factors that are not applicable. For instance, women in Bangladesh do not use seasonal forecasts, and therefore, seasonal forecasts are not applicable.

³ Researchers in Uganda chose to analyze the data quantitatively unlike in Bangladesh and Ghana. Trainers who trained the research teams did not specify if the data collected should be presented quantitatively or qualitatively. Therefore, this discrepancy exists in presenting the information collected.

3.0 WEATHER FORECASTS

3.1 Introduction

Managing risks associated with climate variability is integral to a comprehensive strategy for adapting agriculture and food systems to a changing climate. If farmers have access to climate related information, they are likely to manage risks better. This could help lower and prevent poverty and vulnerability. Therefore, assessing the type of information farmers receive, differentiated by gender and age, through mediums such as cell phones, and the extent to which farmers use this information will be valuable in understanding information gaps and how to address them. This will allow farmers to manage risks and make climate-sensitive decisions.

Climate information is a key resource in farming. Men's, women's and youths' access to this resource could play a role in their ability to adapt. Therefore, it is important to document and address any gender and age-based differences in access to and use of climate information, as well as to understand different needs for information. The objectives of the weather forecast session therefore were:

- iv. To better understand how we make weather information most useful and equitable to rural women and men including the youth.
- v. To better understand the types of weather information available to women, men and youth.
- vi. To understand how and from where women, men and youth get information on weather.
- vii. To better understand men's, women's and youths' abilities to use this information. This includes understanding the opportunities and constraints in accessing and using both daily and seasonal weather forecasts.
- viii. To inform design of action research to reach women, men and youth with weather and climate-related information that they can use in making 'climate smart agricultural' decisions.

3.2 Tools used during the weather forecast discussions

The daily and seasonal forecast tools were used as stipulated in the FAO-CCAFS training document. However, these tools were modified to suit participants' level of knowledge and understanding given the community context. International weather symbols were used to stimulate discussions on daily and seasonal weather forecasts.

The different tools used are discussed below.

Tool 1: International Weather Symbols: International weather symbols (Fig. 1) were used to understand participants' knowledge of daily weather forecasts. The purpose of the exercise was to find out whether the participants understood the meanings of the different symbols and related them to prediction of daily weather.

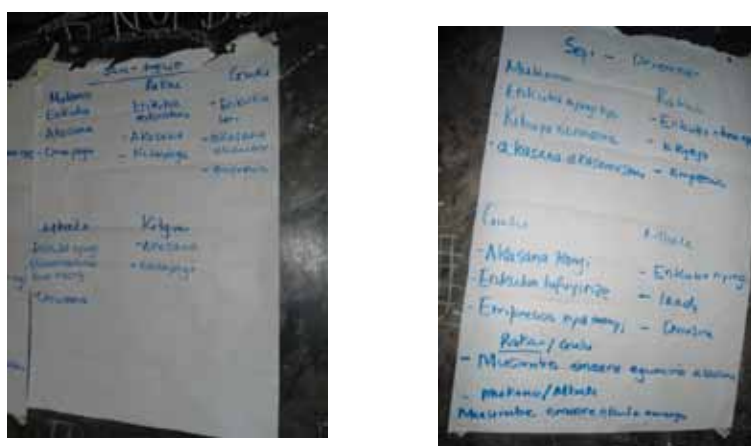
Figure 1: International weather symbols and simulated weather symbols for daily forecasts



(Adopted from <http://www.greatgolf.ie>) (Simulated weather symbols for daily forecasts)

Tool 2: Seasonal weather forecasts: Simulated seasonal forecasts (Fig. 2) were hypothesized for two cropping seasons for selected districts in Uganda. The purpose of the simulated seasonal forecasts was to find out whether the participants understood seasonal forecasts and their implications to make informed agricultural decisions.

Figure 2: Simulated seasonal weather forecasts for selected districts in Uganda



The above tools, in conjunction with guiding questions were used to facilitate focus group discussions on farmer knowledge and use of weather forecast information. Four focus group discussions comprised 14 randomly chosen group of men, 13 randomly chosen group of women, 8 randomly chosen male youth and 7 randomly chosen female youth (following established sampling procedure). The meeting was guided by a facilitator and two note takers recorded the discussion.

In all the sessions with women, the respondents were very active and resourceful when it came to responding to the various questions asked. Some of the respondents argued and disagreed with their fellow respondents' views. However, they later came to an agreement on many of the issues discussed. The female youth, however, were not as resourceful as the women respondents as they failed to respond to most of the questions. On the other hand, the men and male youth participants easily shared information amongst themselves and the facilitators.

The gender-specific approach of separating men and women was preferred by the three groups because it gave each group the opportunity to express themselves fully without interference from other groups. The reporting guidelines in the FAO-CCAFS Gender and Climate Change training document were very good.

Generally the FAO-CCAFS Gender and Climate Change training document guidelines were easy to use because they commanded a sense of direction on exactly what to report on. However, some of the columns and rows in the audit trail required similar responses and it was quite tiring to have to write the same answer twice.

From the discussions with the different groups of farmers, it can be generally concluded that weather information does not add any value to current farming practices since farmers make decisions regardless of forecasts for the most part. There is, therefore, a need to first sensitize the farmers about the importance of weather forecasts if they are to make more informed decisions in agriculture.

3.2.1: Relevance of daily weather forecasts to farmer communities in Kyengeza

International weather symbols are commonly used to communicate daily weather forecasts. In Uganda, these symbols are commonly found in newspapers and on television to convey weather information on a daily basis. Newspapers and televisions are however very rare in Kyengeza, and it is therefore, not surprising that men and women participants had no idea about the meaning, use or importance of the different international weather symbols. The male and female youth, remembered that they had learnt about these symbols during their elementary school days but could not ascertain their use and importance. Surprisingly after probing, two girls noted that these symbols also appeared in the sky and with experience, they could be used to predict weather on a given day. During the discussions, it became quite clear that farmers in Kyengeza rarely used scientifically generated knowledge for daily weather forecasts but heavily relied on their indigenous knowledge to predict daily weather.

Further discussions revealed that approximately 20%, 80%, 50% and 80% of the men, women, and male and female youth farmers in Kyengeza village respectively used daily forecasts that heavily relied on indigenous knowledge. From the results, it is evident that more women than men were interested in daily forecasts.

However, a relatively big number (over 80%) of men, women and youth farmers that relied solely on subsistence agriculture did not use daily forecasts especially those broadcasted over the radio due to the fact that such forecasts were unreliable and not location-specific. These farmers also had limited awareness about the importance of weather forecast information. Those participants that used daily forecasts reported using the following channels for daily forecasts:

Indigenous Technical Knowledge (ITK): ITK was the most common source of daily weather information reported during the focus group discussions with men, women and the youth. The participants said that since weather forecasts broadcasted over radios were largely inaccurate and unreliable, they heavily relied on their traditional seasonal calendars and indigenous knowledge to determine on-set and off-set of rains, and the beginning of a dry season. It was identified that the elderly men and women were responsible for providing this kind of information and passing it on from generation to generation. Some of the ITK included:

- a. ITK for on-set and off-set of rains
 - * Direction of the wind
 - * Heavy cloud cover in the sky with intermittent sunshine
 - * Scorching sunshine with some wind
 - * Very cold evenings and high temperatures in the night
- b. ITK for beginning of dry season
 - * Mist
 - * Too much sun with no wind
 - * Non-scorching sun.

The elderly who impart this knowledge rarely this information with those outside the household. However, younger men do transfer such knowledge through casual conversations in bars and trading centres that are dominated by men. Men who had obtained the information in this manner rarely shared it with their household members when they went back home from social gatherings (approximately 30% of the men). If this ITK were to be documented and available to farmers, it would help triangulate scientifically generated weather forecasts. ITK has been passed on from generation to generation and people have seen it work, and therefore, tend to trust it more than other channels of weather forecasts.

Radio: The second most common source of daily weather information is the radio. It was noted that approximately 80% of the men listened to the radio as compared to only 20% of women. All participants however, indicated that they never purposely tuned in to listen to weather information. The majority tuned in to listen to sports and politics, but accidentally got information on weather. Generally, in Kyengeza village, women's access to radios is limited given that they don't own any. Even those that had some access to the radio had limited time to listen because they were always busy looking after the home and doing other household chores. It should be noted that most of the forecasts broadcasted over the radio were not trusted mainly because they were unreliable and not location-specific. Some of the participants also stated that they lacked radios to receive this information and some did not see the usefulness of the forecasts.

3.2.2 Seasonal weather forecasts

When women and female youth were presented with a hypothetical seasonal forecast, they failed to understand the seasonal forecasts and its implication on agricultural activities even after some prompting from the facilitators. They did not seem to know how to read it or use it to plan for their agricultural activities. The men and the male youth on the hand were able to interpret the seasonal forecasts and its implication on agricultural activities, given their reportedly higher education levels as compared to the women and female youth.

It was generally agreed during the different focus group discussions that less than 10% of the farmers in Kyengeza village used seasonal weather forecasts and over 90% did

not use seasonal forecasts. The reasons given for not using seasonal forecasts included lack of proper devices to receive this information such as radios and mobile phones; not being aware of the right sources to receive such information; and not being aware of the usefulness of the forecasts. Farmers also commented that the generality of the seasonal forecasts made it impossible to use such forecasts for location-specific activities.

The few participants who used seasonal forecasts reported to use the following channels:

Indigenous Technical Knowledge: Similar to the daily forecasts, ITK was reported to be the most reliable source of seasonal weather information. Approximately 70% of the participants said they trusted ITK because it was more reliable than forecasts broadcasted over the radio or on mobile phones. The problem however was that this ITK was not documented and sometimes the elderly people who possessed such knowledge rarely shared it with the younger people, so it was usually not easy to access.

Radios: Similar to the daily weather forecast, participants gave radios as one of the channels through which they received seasonal weather forecasts. As already discussed in section 3.2.1 above, all participants indicated that they never purposely looked for weather information but accidentally got it when they tuned in to listen to other radio programs like politics, sports and programs which focused on agriculture. About 70% of all the participants however, said they did not trust/rely on the radio forecasts because in most cases the forecasts were false, unreliable and not location-specific.

Mobile phones: All three groups reported that they normally received seasonal weather information as short messages (SMS) on their mobile phones from the “prime minister’s office”. As indicated with the radios, participants were also concerned about the accuracy and reliability of weather information received on their mobile phones. They never purposely asked for such information on their mobile phones. Some of the participants still stated that they lacked mobile phones so they missed out on such information.

3.3 Type of weather information that would benefit men, women and youth to manage risks

Although there was a general distrust in weather information that farmers received by radio and cell phone, those who would still like weather information would like to receive information on the following issues:

- Why the environment is changing
- Reliable information on when to plant
- Climate change adaptation and mitigation strategies
- Expected intensity and distribution of rainfall.

Over 20% of the men and 50% of women and youth equally indicated that they preferred daily weather forecasts in order to:

- Plan post-harvest activities
- Ensure water harvesting for domestic use
- Look for fuel wood in time in case of a rain forecast

- Plan for farmer mobility
- Plan for effective household hygiene.

As farmers however, participants would like to have reliable monthly and seasonal forecasts because they would use that information to:

- Carry out early planting
- Do early field preparation
- Look for proper seed to use in time
- Plan for management and appropriate agronomic practices.

3.4 Appropriate methods for delivery of climate information

The most preferred non-ITK channels for the monthly and seasonal forecasts by both women farmers and female youth included (in order of importance):

- Mega phones
- Individual letters
- Village leaders
- Farmer groups
- School children
- Religious and social gatherings
- Print media.

The men and male youth (60%) preferred radios as the most appropriate channel for dissemination of climate information and they preferred the forecasts in their local language.

It should be noted, however, that all the men, women and youth participants preferred a format that was more location-specific such as at sub-county level given the diversity in weather distribution. For the case of mobile phones and print media, the information should be written in the local language since most of the farmers cannot read English.

4.0 Climate Smart agriculture

4.1 Introduction

Climate smart agriculture refers to agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals (FAO, 2010b). The CCAFS Program and FAO aims to support more widespread uptake of climate-smart agricultural practices, by both women and men, and enhance the likelihood that the benefits of initiatives, projects and programs aimed at supporting improvements in farming practices are efficient and equitable. New types of initiatives and projects are now possible in developing countries due to new and expanding global carbon markets and investments in project and programs making payments to smallholders for ecosystem service provision (e.g. water and soil conservation, planting trees on farms). The issue here is how to enhance the likelihood that these initiatives are gender-sensitive and benefit marginalised groups, and not just men and wealthier farming households. The objectives of this session therefore were:

- i. To explore how institutional arrangements (e.g. how benefits/payments are shared; how project activities implemented promote adaptation, e.g. by individuals or groups) can be strengthened to improve access to benefits of climate change-related interventions.
- ii. To understand gender differences in access to climate smart agricultural interventions and opportunities.

4.2 Methods

Key informant interviews with staff and participants of projects/interventions promoting climate smart agricultural practices using guiding questions from the FAO-CCAFS Gender and Climate Change training document were used to solicit information on climate smart agriculture. In addition the 'Changing Farming Practices Tool' with guiding questions to facilitate focus group discussions was used to identify the changing practices in the Kyengeza community farming systems. Two focus group discussions were conducted to find out the various climate smart agricultural activities practised in Kyengeza village. The focus groups comprised two groups of 12 randomly chosen men, and 14 randomly chosen women (following established sampling procedure). The meeting was guided by a facilitator and two note takers who recorded the discussions.

Key informant interviews with guiding questions were very important in obtaining the views of staff from private and public agricultural institutions that promote climate smart agricultural practices. The changing farming practices tool that used focus group discussions with a randomly chosen participants guiding questions were an excellent way to generate information on the climate smart agricultural practices used in Kyengeza village. However a time trend should have been embedded within the changing farmer practices tool to determine the changing trends in farming practices over time.

4.3 Extent of use of climate smart agricultural practices in Kyengeza

Climate change is a reality among the farming communities in Kyengeza village, Rakai District. Both men and women associate climate change with changes in the distribution and duration of the rainy season, which have become very difficult to predict. The changes in the distribution and duration of rain has made it difficult for both male and female farmers to easily predict the on-set and off-set of rain, as well the appropriate timing to carry out crop-related agronomic practices. Amidst these challenges, both male and female farmers participated in agriculture as their sole source of livelihood and food security. Various farmer categories (male and females farmers) shared their views on the wide spectrum of coping strategies that they used to adapt/mitigate climatic changes effects (see Table 2).

Table 2: Extent of use of given climate smart technologies in Kyengeza Village

Type of technology		Total proportion of farmers using a technology	Proportion of men using a technology	Proportion of women using a technology
Soil and water conservation	• Mulching	80%	60%	40%
	• Micro-irrigation	10%	100%	0%
	• Water catchment	95%	70%	30%
	• Domestic water harvesting	5%	90%	10%
Soil fertility enhancement and pest control	• Use of livestock manure	20%	90%	10%
	• Use of human manure	10%	0%	100%
	• Use of inorganic fertilizers	5%	99%	1%
	• Use of mechanical traps	40%	20%	80%
Crop management practices	• Use of improved seed	20%	50%	50%
	• Use of drought-resistant varieties	70%	50%	50%
	• Early planting	80%	50%	50%
	• Integration of livestock, agroforestry and crops	50%	50%	50%
	• Timely agronomic practices	90%	50%	50%
	• Crop rotation	50%	50%	50%
	• Intercropping	90%	50%	50%

Other practices	• Use of small scale irrigation	5%	100%	0%
	• Introduction of zero grazing	10%	90%	10%
	• Change in land tenure system	-	-	-

Results in Table 2 indicate that farmers used three major types of “climate smart” agriculture technologies. The most widely used technologies include water catchment, intercropping and mulching. Though both men and women used the different adaptive measures, the extent of use and strategy of use differed among men and women. The following sections discuss each of the categories in detail with special emphasis on their use by men and women farmers in Kyengeza village.

4.3.1 Soil and water conservation technologies

Farmers in Kyengeza used three major practices to improve soil and water conservation. The practices included mulching, micro-irrigation and use of water catchment area. Among these, use of mulching and water catchment (using trenches) was the most common in the village where more men (60-70%) than women used these practices. Both men and women used the practices to conserve soil and water in their banana and coffee plantations. More men used mulching because the mulching material had to be purchased and it is mostly male farmers who are financially empowered to purchase mulching materials off-farm. Women usually obtained mulch from crop residues that they collected on their own farms. The common mulching materials include grass, maize stalks, bean stalks and hull, and tree leaves. However, due to increasing population and use of more agricultural fields, the grasslands are being cultivated hence causing scarcity of mulch. Construction of trenches (commonly used in banana plantation) is very labour intensive making it very tedious for women to invest their time in creating water catchment areas. More labour is further needed to stabilize the trenches by either planting elephant grass or pasparum at the boundaries of the gardens to catch running water. This further increases the labour requirements and hence is not easily practised by women.

One should also note that mulching and use of trenches are traditional farming practices that have been used by both men and women farmers to conserve water in their coffee and banana plantations. Today the practices are becoming more popular because public and private agriculture service providers are promoting their use due to decrease in soil fertility, and rainfall intensity and distribution. An emerging soil and water conservation practice in Kyengeza village is micro-irrigation.

Micro-irrigation is only used by 10% of the farming community and more so by the male youth who grow high value crops such as tomatoes and vegetables. This practice too is also very labour intensive, which may in the future make it unattractive for women farmers. Domestic water harvesting is also being undertaken using traditionally constructed water tanks, but this practice is common amongst men, considering its labour intensity.

4.3.2 Soil fertility enhancement and pest control technologies

Decreasing soil fertility is one of the major problems facing farmers in Kyengeza to date. Though this is true, there is limited effort to enhance soil fertility. In the entire Kyengeza community only 5-20% of all the farmers endeavour to improve soil fertility. There is low use of soil enhancement technologies due to lack of resources (livestock and capital) to obtain the raw materials. The common practices for soil fertility enhancement include; (i) use of organic manure and; (ii) use of artificial fertilizers. Organic manure is obtained from livestock and human waste. Surprisingly, men prefer to use livestock manure as compared to women. This is also true because unlike women, men can purchase livestock manure from large kraals around the village. It is important to note that communal livestock rearing systems are uncommon in this part of Rakai district. Increasing population pressures and the change in land tenure system where public land is now individually owned has encroached on previously communal grazing land. Zero grazing and tethering are now the common grazing systems since the majority of households on average own 1-3 large animals.

Due to the scarcity of livestock manure, women farmers have ventured into the use of human urine as fertilizer in their banana plantations. There is very low use of inorganic fertilizers in the entire village. The few individuals using inorganic fertilizers are men farmers since they can afford to purchase these fertilizers. Further, given their ability to travel long distances away from home, men find it easier to purchase inorganic fertilizers away from their own villages. There is an increase in use of mechanical traps for pest management by over 40% of the entire community in the banana plantations. The practice is more commonly used by women than men.

4.3.3 Crop management technologies

Crop production is the source of livelihood and food security in Kyengeza village. Because of the importance of crops in the general farming systems, farmers carried out various crop-related practices. Major practices to enhance crop production include; (i) use of drought-resistant varieties; (ii) carrying out of timely agronomic practices, (iii) intercropping, and (iv) agroforestry. These practices were carried out by 80-90% of all farmers in the community. Both men and women equally practised these technologies. Use of drought-resistant varieties is becoming a very common practice in Kyengeza village more so for cassava, a major food crop. The technology is becoming more popular than ever given the intermittent rainfall as well as failure of farmers to predict the times when the rains will come. In addition, both men and women farmers are adopting dry planting as a strategy to efficiently utilize any moisture when the rains come. Timely field operations are a prerequisite, especially for short term crops such as beans and maize. Both men and women farmers are quite aware of these practices such as early planting, timely weeding and timely harvesting. These three practices are becoming more popular today than ever before due to inability of farmers to predict weather accurately. In addition, the rainfall is very erratic and unreliable, so both men and women carry out these practices to harness moisture when it is available.

Intercropping and crop rotation are also common in Kyengeza. These practices produce a diversity of products that increase food security, along with diversifying household income for farmers. In fact, according to farmers, there has been a decrease in disease and pest incidences due to intercropping. This has also led to improvement in soil productivity. Conversely, due to increasing population density, there is decreasing acreage that prevents resting of the land and this could lead to soil exhaustion.

Another crop management practice that is practised by less than 20% of the farmers is the use of improved seed. Most of the farmers (both men and women) acknowledged using home-saved seed to produce most of the farm crops. However use of improved seed ensures that certain attributes such as early maturation and better yields, among others, are enjoyed by the farmers. These crops can reach maturity even with a short rainy season. The varieties are also resistant to pests and diseases and are high yielding. However, it was reported that these fast growing crops cause soil exhaustion and the taste of their products is less preferred to older varieties. For example, an elderly man stated that the tubers in a new cassava variety, which is currently cultivated, has a bitter taste compared to that of the old variety. In addition, agricultural input shops sell poor quality or fake seeds. In fact in the village leaders' meeting, it was reported that some seed suppliers dye seeds so as to mimic the colour of the improved seeds. The seeds are also inaccessible and in most cases are unaffordable to 80% of the farmers. In this community, it is men who purchase improved seeds because the seed shops are relatively far from the village and women are restricted from moving long distances.

Agroforestry is also a practice used in the Kyengeza farming system and is integrated with crop production and livestock keeping. Almost half of the households incorporate trees on their farms. The most common trees grown on the farm are fruit trees such as avocado, mangoes and citrus, which were planted within the gardens. Women were reported to participate more than men in tree planting training sessions. The fruits generated from the trees were mainly for household consumption rather than for sale. It is also important to note that the forage from the fruit trees was sometimes used as fodder while the tree branches were used as fuel wood. In the men's meeting, it was very clear that the majority of them were interested in commercial trees such as ficus, eucalyptus and pine. The ficus was also noted for its ability to create a micro-environment that increases productivity within the banana plantation as well as provide forage for livestock. However, some tree species like eucalyptus and pine were reported to decrease soil productivity. Like for improved seed varieties, the improved tree seedlings are also inaccessible and in most cases unaffordable.

4.4 Are the coping strategies really promoting climate smart agriculture?

Climate smart agriculture refers to a context where a farmer uses an agricultural technology that can meet the three attributes mitigating the effect of climate change, enhancing the ability of the farmer to adapt in the context in question and at the same time achieve food security. Table 3 shows the attribute(s) of climate smart agriculture that each of the practices currently used possesses. Results in the table reveal that almost 100% of the practices that the farmers are currently using are not climate smart. Only two of the three components (adaptation and food security) of climate smart agriculture can be met by the practices that are outlined. The mitigation component seems to be a very difficult one for the farmers to meet, let alone to think about and put into practice.

Table 3: Extent of use of given climate smart technology in Kyengeza village

Type of technology Adaptation		Attributes of climate smart agriculture		
		Mitigation	Food Security	
Soil and water conservation	• Mulching	√	X	√
	• Micro-irrigation	√	X	√
	• Water catchment	√	X	√
	• Domestic water harvesting	√	X	√
Soil fertility enhancement and pest control	• Use of livestock manure	√	X	√
	• Use of human manure	√	X	√
	• Use of inorganic fertilizers	√	X	√
	• Use of mechanical traps	√	X	√
Uptake of recommended scientific agronomic practices	• Use of improved seed	√	X	√
	• Use of drought-resistant varieties	√	X	√
	• Early planting	√	X	√
	• Integration of livestock, agroforestry and crops	√	√	√
	• Timely agronomic practices	√	X	√
	• Crop rotation	√	X	√
	• Intercropping	√	X	√

4.5 Drivers to use climate smart agriculture

Various incentives drive both men and women farmers to adopt climate smart agricultural practices, namely practices that help adapt to climate change and/or provide food security. The following sections briefly discuss what drives farmers to use improved farming practices:

- a. **Income:** Income generation is one of the incentives for using improved farming practices. This is not surprising in Kyengeza village since most people earn their livelihood through agricultural production. For example, one male farmer said that he could use improved seed and invest in fertilizer if he believes that there will be an increase in yield to sell at the market. More men than women were heavily driven by income generation to invest in climate smart agriculture.
- b. **Food availability:** Food availability is paramount for any household. Households will take on climate smart agriculture practices that ensure availability of food for the family. This was more of a concern for women

farmers who had the sole responsibility of ensuring that their household members had food on the table.

- c. **Changing climatic conditions:*** Farmers in Kyengeza village have experienced changing climatic conditions that manifest themselves as; (i) changing crop seasons, (ii) changing duration and intensity of rainfall, (iii) emergence of new crop diseases and pests, (iv) prolonged drought seasons and, (v) erratic rains and thunderstorms. These have adversely affected the cropping calendars and as a result, farmers have had to devise various means of survival (livelihood and food security) by using better farming practices.
- d. **Farmer training opportunities:*** Rakai district has a number of service providers both public and private that encourage farmers to use new cropping practices. Among these are Rural Poverty Eradication, District Agricultural Training and Information Centre (DATIC), Community Integrated Development Initiative (CIDI), Community Enterprises Development Organization (CEDO), Rakai Counsellors' Association (RACA), and National Agricultural and Advisory Services (NAADS). The information on use of new cropping practices is relayed to the farmers through farmer training sessions. The training sessions have also become popular due to the introduction of new crops varieties and animal breeds in the area. Women farmers are commended for their active participation in the farmer training sessions though in reality they do not put into practice what is learned during the training. It was also noted that some women farmers have several constraints that inhibited their active participation in farmer trainings. Among these were, (i) laziness, (ii) lack of interest, (iii) prevention by husbands, (iv) lack of timely information, and (v) unaware that there are training opportunities.
- e. **Differential access to production resources:*** Farmers need to invest production resources in order to promote or utilize climate smart technologies. Though this is true, men and women farmers had differential access to production resources including labour, inputs and capital with the former having more access. So without resources, it is very unlikely that women farmers would invest in climate smart agriculture.

4.6 The role of institutions in promoting climate smart agriculture

Institutions, both private and public, play a vital role in promoting climate smart technologies in Rakai district. Table 4 shows the various institutions and the types of technologies that they promoted to improve agricultural production.

Table 4: Types of institutions and the type of technologies promoted to enhance agricultural production

Name of institution	Type of institution	Type of technologies promoted
Rural Poverty Eradication	Private	<ul style="list-style-type: none"> • Tree planting • Use of improved seed varieties (beans, maize, vegetable) • Water harvesting • Integration of livestock and crops • Provision of price information
District Agricultural Training and Information Centre (DATIC)	Public/Private	<ul style="list-style-type: none"> • Planting of fruit trees • Promoting water harvesting • Use of soil conservation in banana plantations
Community Integrated Development Initiative (CIDI)	Private	<ul style="list-style-type: none"> • Tree planting • Use of terraces for soil and water conservation • Construction of low cost water harvesting technologies
Community Enterprises Development Organization (CEDO)	Private	<ul style="list-style-type: none"> • Promoting minimum tillage • Provision of fruit trees • Provision of improved seed (beans)
National Agricultural Advisory Services (NAADs)	Public/Private	<ul style="list-style-type: none"> • Provision of inputs (beans, maize, livestock, bananas, fertilizers, clonal and elite coffee) • Provide farmer training on agronomic practices • Promotion of micro-irrigation (new practices) • Promotes tree planting
Rakai Counsellors' Association (RACA)	Private	<ul style="list-style-type: none"> • Tree Planting • Construction of energy saving stoves • Use of terraces for soil and water conservation

All the institutions promoted tree planting, and soil and water conservation. Tree planting encompassed growing of fruit trees such as avocado, oranges, and mangoes intercropped with coffee and banana. Soil and water conservation practices were also promoted in form of terraces, especially in the banana plantations. Organizations such as Rural Poverty Eradication, CEDO and NAADs provided free inputs, such as seed to farmers. It is important to note that all these organizations target farmer groups in general and had no specific policies to increase access of services specifically for women or other disadvantaged groups.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 MAJOR FINDINGS

CLIMATE ANALOGUES

- i. Men and women travel to other villages for numerous reasons including going trading centres, to sell commodities, to take their children to better schools, and visit hospitals.
- ii. Men and women do seek information on agricultural practices being pursued in other locations, and young men in particular are quite mobile and actively seek market information. The major constrain that men face that prevent them from being mobile is lack of financial resources for transportation.
- iii. Women face more constraints to seek out agricultural information due to lack of mobility caused by cultural restrictions that prevent taking certain transportation or lack of approval from husbands. Women also may not have time since they have commitments at home.

CLIMATE INFORMATION

- i. The most common sources of daily weather information is indigenous knowledge. Radio and mobile phones are secondary. Over 80% of the men, women and youths do not trust or have lost interest in weather forecasts broadcast over the radio or mobile phones because they are considered unreliable and not location-specific.
- ii. Women find daily weather forecasts valuable for planning post-harvest activities, ensuring water harvesting for domestic use, and for timing of gathering fuelwood.
- iii. Seasonal forecasts are not common accessible as only 10% of men have come across seasonal forecasts.
- iv. Even though men, women and the youth do not rely on the radio and mobile phones for forecasts, they would be interested in receiving more specific forecasts to help them decide when to plant.

CHANGING FARMING PRACTICES

- i. Men are more likely to use mulching as a method for soil and water conservation compared to women since mulching material has to be purchased off farm, which is easier for men to do. Men are also more likely to use inorganic fertilizers compare to women as a method for enhance soil fertility because it is obtained off-farm. However, when it comes to crop management techniques, such as intercropping, men and women engage in this activity equally.

- ii. Majority of farming techniques used help farmers to adapt to climate change and enhance food security, while allowing farmers to increase their income. However, there is very little action taken to explicitly mitigate greenhouse gas emissions through farming..
- iii. Various types of organizations support farmers to adopt certain farming practices. A combination of private and public institutions provide training on planting trees, what types of improved seed varieties to use, how to water harvest and integrate crops and livestock.

5.1 RECOMMENDATIONS

Based on the results of this study, we make the following recommendations:

- i. Farmer to farmer exchanges have the potential to benefit both men and women to gain knowledge about adaptation practices. However, to support women in particular to participate in such exchanges, transport needs to be provided to villages that are nearby. However, women in many cases need to seek permission from the husbands to travel, which would also require approaches that help sensitize the men regarding the value of women learning about agricultural and adaptation practices.
- ii. Trust in weather forecasts provided over the radio and mobile phones needs to be improved. This will require providing more location specific forecasts. Alternative methods to transmit information preferred by women could be the use of a mega phone, or through announcements in public places such as markets and centres of worship.
- iii. Many farming practices help households adapt to a changing climate. However, greater efforts need to be made to understand how current practices can also contribute to mitigation, as this is not well understood.



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