

USING A GENDER LENS TO EXPLORE FARMERS' ADAPTATION OPTIONS IN THE FACE OF CLIMATE CHANGE: RESULTS OF A PILOT STUDY IN GHANA

Working Paper No. 17

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

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Abstract

The Upper West Region of Ghana and especially the Lawra-Jirapa districts are 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 Doggoh in the Jirapa district of the Upper West Region of Ghana.

The segment on climate analogues showed that a gender-differentiated village resource maps could be used as a tool to communicate the concept of ‘climate analogues’ and to facilitate farmer-to-farmer exchange visits to analogue sites. Both men and women groups mentioned farming practices and coping strategies as topics they would like about to learn during an exchange visit to an analogue site.

On weather information, all groups (men, women and youth) indicated they receive daily weather forecasts mainly through the radio but these are mostly received by the men and male youth because they own the radio sets. Women do not generally own radio sets in the village setting and as such, receive the daily weather information through their husbands or sons when they are in the house and switch on their radio sets. All groups (men, women and the youth) had never seen the seasonal forecast chart issued by the Ghana Meteorological Services. Both daily and seasonal weather forecasts would be preferred by the community and through the medium of the radio translated, into the local dialect. The church, the chief, assemblyman (local government representative) and agricultural extension agents could publicize the forecasts.

Currently some climate smart agricultural initiatives, like tree planting and agroforestry, exist at the individual and household level. The community expressed the desire to undertake any climate smart agricultural initiative. Several external institutions have in the past facilitated the formation of local women groups and promoted agricultural activities. These groups can be used as entry points for future climate smart agricultural initiatives. The gender-specific focus groups in this session on climate smart agriculture worked out well because no group had influence over the other, and each shared their experiences without intimidation. The guiding questions also helped in sourcing the responses from the discussants and gave order to the way questions were sequenced.

Keywords

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

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LIST OF ABBREVIATIONS & ACRONYMS

ADRA	Adventist Development and Relief Agency
CCAFS	CGIAR Program on Climate Change, Agriculture, and Food Security
CERWED	Centre for Rural Women Empowerment and Development
CGIAR	Consultative Group on International Agricultural Research
CS	Climate Smart
DSSAT	Decision Support System for Agro-technology Transfer
FAO	Food and Agriculture Organization of the United Nations
MOFA	Ministry of Food and Agriculture
NGO	Non-Governmental Organization
RAAP	Rural Action Alliance Program
TV	Television

1.0. INTRODUCTION

The CGIAR Program on Climate Change, Agriculture and Food Security (CCAFS) and the Food and Agriculture Organization (FAO) of the United Nations seek to achieve ‘climate smart’ agriculture, i.e. agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals. Both agencies see a gender-sensitive approach as crucial to achieving climate smart agriculture, however to date attention to women’s and men’s roles, needs and resources are largely lacking. Thus in the longer term, CCAFS and FAO aim to mainstream gender issues into climate smart agriculture through capacity building and research so that women participate and benefit as much as men. CCAFS and FAO have developed a training document on gender, climate change, agriculture and food security, which includes Participatory Action Research methods and guidance on how to analyze the data collected in using those methods. Thus the overall objective of this short-term research was to test these tools and methodologies on gender analysis in climate change, agriculture and food security.

1.1. Description of the study area

The study was undertaken from 1-4 November 2011 in the village of Doggoh, (Latitude 10° 32’ N, Longitude 2° 43’ W), approximately 3 km West of Jirapa in the Upper West Region of Ghana. Doggoh is one of seven villages selected for the study (see Figure 1). According to the 2010 housing and population census of Ghana, Doggoh has a population of 5,773. Agriculture is the major economic activity of the people.

The area has a mono-modal rainfall pattern of about 5–6 months beginning from May to October, with a long term annual mean precipitation of 900 mm. During the dry season (November to April), the area is under the influence of the dry north-eastern trade winds (harmattan). The area lies within the Guinea Savanna agro-ecological zone with scattered cash trees, such as Shea, *Parkia biglobosa* and Acacia. The soils are predominantly shallow and sandy in texture.

Two types of farming systems are practised in the area are compound and bush farming systems integrated with livestock. Farmers also keep poultry, small ruminants like sheep and goats, pigs and cattle. The major crops grown are cereals (maize, sorghum, millet and to a lesser extent, rice) and legumes such as groundnut, cowpea, Bambara groundnut and soybean. Three main types of cropping patterns are identifiable in the

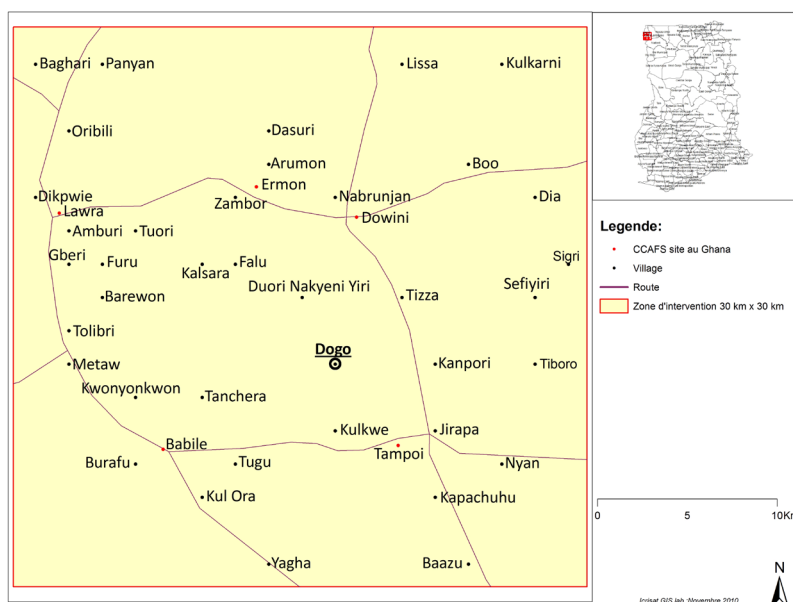


Fig 1: Map of Ghana showing CCAFS project site and village (Doggoh)

area. These are intercropping, relay cropping and sole cropping. Rotation of intercrops is the main cropping pattern in the area. Relay cropping of cowpea and millet or sorghum is significant in the area. This practice is conducted as pure relay (i.e. sorghum or millet transplanted after cowpea harvest) or with some overlap of the two crops that is not significant enough to impose competition between them. Sole cropping of groundnut, soybean and cowpea is also practised.

1.2. Pre-study process

The study was undertaken by a research team consisting of two research facilitators (one male and one female) and four note takers. The number of note takers was increased to four instead of two because past experience has shown that the smaller the research team, the more easily researchers become bored and fatigued. A reasonable size tends to make the team lively. It was important to recruit research facilitators and note takers who could speak the local dialect and who were familiar with the community. The function of the note takers was to record, as much as possible, the responses from participants during group discussions. Prior to undertaking the field activities, a one-day training was organized for the entire research team to ensure that every member understood the objectives of the research; the data to be collected or recorded especially by note takers; and the desired outcomes for each activity. The roles and responsibilities (who will do what, when, how, using which tools, and which materials) for everyone in the team were agreed upon. It was also important for every team member to know and be familiar with the roles of the other team members in case they had to cover for them for whatever reason. The team was taken through some facilitation skills, the training document and de-briefing documents.

The meeting was also used to discuss an entry strategy into the community. It was agreed that the team would enter the community in two stages – a first visit to meet with the village chief, his elders and opinion leaders and then a second visit to meet the entire community. Based on the entry strategy, a message was sent through one of the note takers to a village ‘volunteer’ who acted as an ‘ambassador’. The volunteer was identified in previous visits to the village when we realized that he was the errand man for the chief when he wanted to send information round the village. He also had a mobile phone and could be contacted by the researchers when necessary. Another advantage of the volunteer was that he had some formal education and so could read, write and speak English and helped translate some of the questions to participants in the local dialect when the researchers found it difficult. The ‘ambassador’ informed the chief and his elders of our intention to visit the village on a day suitable for them to discuss the research. A day was then fixed by the village elders for the first meeting.

Participants for the focus group discussions were selected, using a random sampling procedure, before making our first visit to the community. The random sampling procedure, using the randomized function in Excel, as outlined in the training document was followed to limit possible biases in participant selection and in order to allow for comparison of the results across villages. For each day’s topic, 15 households were selected for the men’s focus group discussion and another 15 households were selected for the women’s focus group discussion. For the climate information topic, four focus groups (men, women, male and female youths) were selected for discussion.

1.3. Community entry process

On the scheduled date of the first meeting, the research team met with key people comprising the chief and his elders, the government representative at the local level (called assemblyman), and three women opinion leaders. It was considered crucial to invite three women leaders to this first meeting to ensure that that turnout of women during the second community meeting would be high. During this first meeting, the research team introduced the research project and the activities to be undertaken and for how long. This verbal discussion was followed with a formal letter to the chief and assemblyman for the area to introduce the study and ask for their consent. At the end of the first meeting, the chief and his elders fixed a day on which the research team would meet the entire community.

On the scheduled date for the meeting with the whole community, villagers were informed that their village had been selected again for this research because of their enthusiasm and cooperation in the past (CCAFS baseline study was carried out in the same village). We told them we were building on the previous surveys and the purpose of the current study was to listen to the voices of both men and women. The importance of gender in agriculture, development, food security, and family health was emphasized. After the introductory remarks, the agenda for the next four days of work was outlined to the community. We had the names of all household heads from the previous baseline household survey. With the list of all household heads, the random sample of 15 households, who were to select a male representative and 15 households, who were to select a female representative for each day's focus group discussion was announced to the community. When a household head was not present during the community meeting, the village volunteer who acted as 'ambassador' was tasked to inform the household head to nominate a man or woman for the focus group discussion.

Throughout the entire meeting, no mention was made of any compensation to be paid to participants in the focus group discussions. This strategy was adopted to avoid attracting large numbers of people who would turn up simply because of the compensation package. As a strategy to manage expectation, no mention was made of CCAFS. The community was informed that as researchers we were only agents asked to collect information that would help in the design of a possible agricultural intervention for the entire Upper West region, but that we did not have details of the intervention.

The following sections discuss the results of the climate analogue, climate information, and climate smart agriculture sessions.

2.0. Climate analogue session

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.

2.1. Where people visit

The study showed that men travelled to many more places and further away from their village compared to women. For instance the men indicated they travelled to the following places – Konzokala, Tie, Forikpe, Baaduori, Jirapa, Babile, Lawra, Nandom, Kompor, Langmaa, Duori, Liissah, Tuopari, Hamile, Eremon, Yoora, Guo, Tiza, Bo, Kumbo, Busie, Tampoe, Gbari, Sabuli, Hian, Fielmuo, Jeffiri, Karni and Ullo. Unlike their male counterparts, women travelled to fewer places and not very far from their village. The villages they visited most frequently were Jirapa, Babile, Konzokala, Tie, Guo and Wulling. The farthest women travelled to was Babile, which is about 8 km from the village, whereas men travelled as far as Hamile, which is 56 km away, and even further to Burkina Faso.

2.2. Reasons for travelling

Men generally had many more reasons for travelling than women. Men travelled for one of the following reasons:

- i. To trade in Babile, Lawra, Nandom, Tuopari, Hamile, Fielmuo, Tiza, Sabuli, Ullo, Busie and Kumbo.
- ii. To mourn with their relatives and friends in Konzokala, Tie, Forikpe, Baaduori, Babile, Langmaa, Duori Lissa, Eremon, Kompor, Bo, Karni, Ullo, Yoora, Guo, Tiza, Jeffiri and Jirapa.
- iii. To invite people from these villages to their festivals in Konzokala, Tie, Forikpe, Baaduori, Jirapa, Babile, Lawra, Nandom, Kompor, Langmaa, Duori, Liissah,

Tuopari, Hamile, Eremon, Tiza, Bo, Kumbo, Busie, Tampoe, Gbari, Sabuli, Hian, Fielmuo, Jeffiri, Karni and Ullo.

- iv. To search for women to marry in Langmaa in Burkina Faso, Nandom, Wuliing, Babile, Duori Lissa and Konzokala.
- v. To pray in Nandom and Jirapa.
- vi. To visit their children attending school in Lawra, Ullo and Nandom.
- vii. To celebrate festivals in Konzokala, Tie, Forikpe, Baaduori, Jirapa, Babile, Lawra, Nandom, Kompor, Langmaa, Duori, Lissah, Tuopari, Hamile, Eremon, Tiza, Bo, Kumbo, Busie, Tampoe, Gbari, Sabuli, Hian, Fielmuo, Jeffiri, Karni and Ullo.

In contrast to men, women had fewer reasons for travelling as they only travel out of necessity. Some reasons given by women for travelling included the following:

- i. To sell firewood, charcoal, Shea butter, and vegetables, which are usually made during the dry season when they are less busy.
- ii. To visit relatives or attend funerals.
- iii. In search of water, especially during the dry season. To consult herbalists when they or one of their children is sick.

2.3. Frequency and means of travel

The frequency of visits by both men and women depended on the reasons outlined above. For instance marketing is weekly, festivals are annual, funerals could occur anytime, while prayers are weekly. Women indicated they travelled more frequently during the dry season because that is when they have less work to do. The dry season is also the period they have time to do their socio-economic activities such as Shea butter extraction, 'pito' (a local alcoholic beverage) brewing, selling of fuel wood and vegetables from their dry season gardens. They have to travel to nearby villages or towns such as Jirapa to sell their goods.

Men mostly travel to distant places such as Nandom, Fielmuo, Lawra and Busie by bicycle. Occasionally, they use lorries to Nandom, Lawra and Fielmuo. Movement to the nearby villages is mostly by bicycle and foot. Men, who travelled to destinations such as Burkina Faso, used bicycles up to the river and then crossed by canoes at Tuolong and Gbetuoli (entry points into Burkina Faso).

Women travel by the same means as their male counterparts. For women who have bicycles and money to board vehicles it is much easier to travel further. For those who have neither a bicycle nor money to board a vehicle, but have to travel to distant villages, it is very difficult. The enabling factors to these visits are access to bicycles, money to board a lorry and timing (i.e. when they are less busy, especially during the dry season).

2.4. Differences and similarities in climate of villages visited

On whether participants thought their village was different in any way from the villages they tend to visit, the men felt nearby villages such as Tampoe, Konzokala, Wulling,

Forikpe, Baaduori, Yoora, Guo, Duori and Kompori were not different from their village, Doggoh, because the weather conditions; funeral and festival celebrations farming practices; vegetation and soil are the same.

The male respondents, however, indicated that distant places such as Nandom and Burkina Faso were hotter and drier than their village because the land was virtually bare and relatively closer to the Sahara desert. As to whether their village could become like Nandom or the village they often visit in Burkina Faso, a participant said *Doggoh* has almost become like *Nandom*. We have started experiencing some of their harsh conditions’.

On whether their village was wetter/drier or hotter/cooler than the villages they visited, women compared two villages they frequently visited to trade, namely *Jirapa* and *Babile*. They said *Jirapa* and *Babile* were similar to their village in terms of rainfall and wind but that the soils were different because their village had stony soils, whereas *Jirapa* and *Babile* had ‘softer’ soils.

To prevent their village from becoming like Nandom, men suggested that they would have to plant more trees, stop indiscriminate cutting and burning of bush, diversify their livelihoods by rearing more livestock, use early maturing and improved crops variety, and prepare more compost to apply on their farms. Women suggested tree planting and agroforestry as programs that would improve their soil and environment.

2.5. Information sought during visits

The men who travel to neighbouring villages and towns indicated that they do not deliberately seek information related to agriculture, but they observe differences in farming practices, some of which they are already practising. For instance, the male respondents indicated that farmers in Burkina Faso had better farming practices due to the use of bullocks to till the land, planting on flat seedbeds, and planting more fruit-tree crops such as mangoes and cashew. They said they have also observed that farmers in Burkina Faso reared more livestock. Respondents asserted that they have learnt over the years, how to plant grafted mangoes and flat tillage from relatives and friends in Burkina Faso. They have adopted early maturing crop varieties, bought prolific animals and observed the practice of not burning the vegetation from the farmers they visited in Burkina Faso.

Women said when they travel to other villages they observe and ask their relatives and friends questions, especially relating to agriculture, environmental protection and social issues. Women mentioned new farming practices such as planting in rows, making ridges and ploughing across slopes as things that they have observed from other communities and which they now practise. The women cited the formation of a group credit scheme, locally known as ‘susu’. Such local credit schemes provide small loans to members to engage in income generating activities, which enables them to support their families in times food shortage.

2.6. Reasons for not travelling

Both men and women groups indicated that not all of them travel to neighbouring villages. The elderly and children in particular do not travel unless they have to be sent

to a neighbouring village or community when sick. The factors hindering their mobility, mentioned by both men and women groups, were:

- i. Lack of means of transport such as bicycles
- ii. Lack of money to board vehicles
- iii. Distance of the place from the village
- iv. Harassment from security agencies in neighbouring Burkina Faso
- v. The seasonal flooding of the Black Volta between Ghana and Burkina Faso.

In addition to the first three reasons given above, women indicated they were constrained by their children, which they described as invisible ‘chains’ around their legs. The women explained that because of the children they couldn’t travel to very distant places for a long period of time.

2.7. Potential for farmer-to-farmer exchange visits

When asked whether they would like to learn from other people’s experiences through an exchange visit to other places, the response from the men’s group was positive. They particularly mentioned farming practices, how they cope with the changing climatic conditions and possibly how to delay the onset of harsher climatic conditions as topics they would like to learn from analogue sites.

When the idea of a farmer-to-farmer exchange program was mentioned among women, they were initially hesitant to join such a program because they thought they would have to walk. However, when it was explained to them that they would not have to walk, they expressed interest and were excited about learning new ideas from other areas because they felt they would definitely benefit from such a program.

A facilitated farmer-to-farmer visit would be beneficial because farmers will get the opportunity to interact and get firsthand information on possible adaptation strategies. This exchange can be more inclusive if conscious efforts are made to include farmers based on their gender, age and wealth. For future farmer exchange visits and information exchange Nandom, Kumbo and Langmaa in Burkina Faso could be considered. In order to ensure women’s participation in particular, quotas can be provided in the farmer-to-farmer exchange program.

2.8. Methods component of the climate analogue session

A crucial aspect of this research was how to introduce the concept of ‘climate analogues’ as a vehicle for farmer-to-farmer exchange visits. The concept of climate analogues was introduced to participants using the village resource map as a tool and guiding questions. Participants in separate male and female focus group discussion were asked to draw a map of their village and its key natural resources, infrastructure, social services and land use systems. Participants were next asked to indicate on the village map, neighbouring villages and places they usually visit or travel to. Based on this village resource map with indications of where they travelled to, discussions were initiated, using guiding questions on the reasons for visiting these sites, if they perceived these places to be wetter/dryer



Plate 1: Doggoh village resource map drawn by women

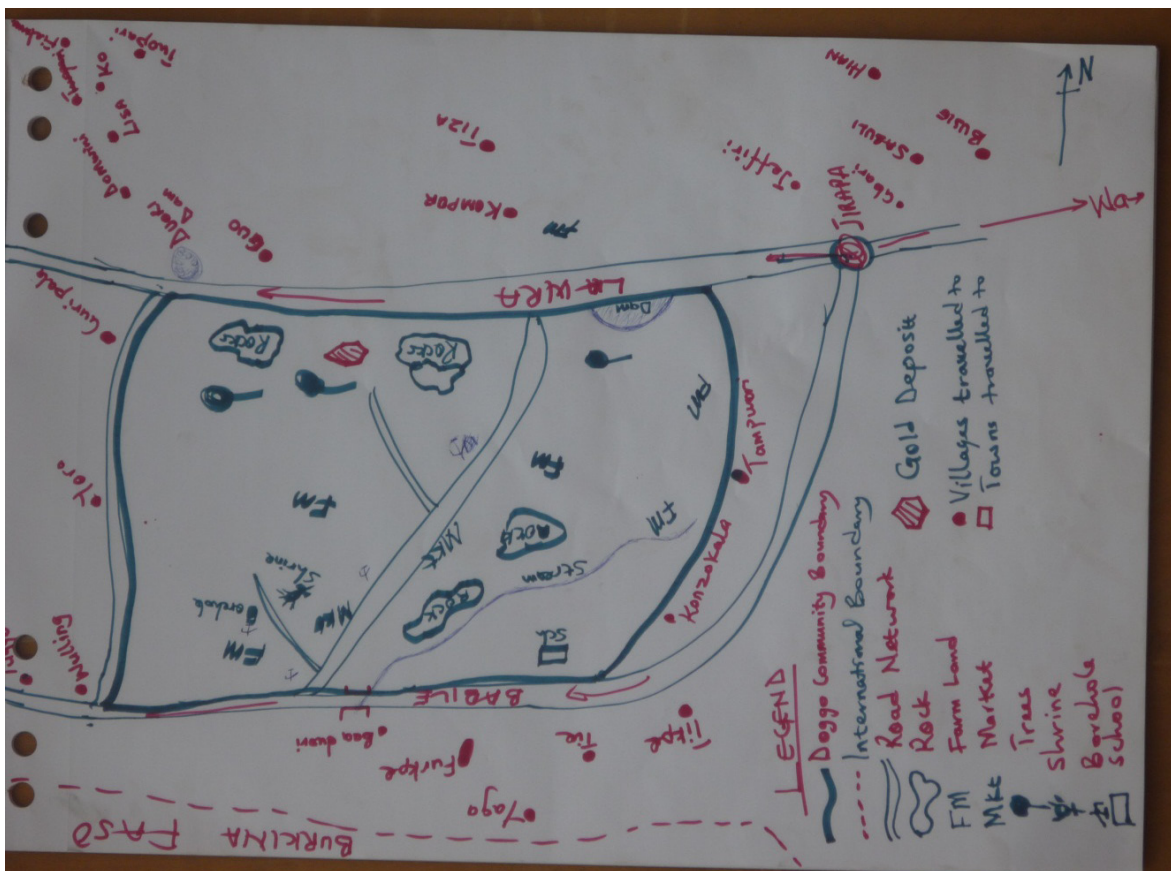


Plate 2: Doggoh village resource map drawn by men

or warmer/cooler than their village, and if they exchanged any information pertaining to agriculture during these visits. These discussions provided the platform to introduce the concept of 'climate analogues' as sites that can be visited today, that may resemble the climate of another farming community in 2030. It was explained to participants that because of climate change, their village which they perceived was cooler now could become like the warmer villages they visited. The importance of learning from areas that were currently experiencing warm conditions in order to prepare for the future was introduced. It was then easy to discuss the possibility of farmer-to-farmer exchange visits to sites warmer than their village to learn and exchange information on agriculture.

It was easy for both male and female groups to draw the village resource map as participants had carried out a similar exercise earlier. The participants were able to identify the types of resources available in the community and were able to indicate them on the map. They were also able to define clearly their boundaries with neighbouring communities and where they travel to. There were, however, some differences in the village resource maps made by women and men.

The women identified various physical structures they came into contact with in their daily activities (Plate 1). These included the grinding mill, boreholes and dam where they fetch firewood and water, antenatal clinic and the smaller roads linking these structures within the village. These features were absent in the men's village resource map (Plate 2). The village resource map was helpful in communicating the concept of climate analogues. Once they were able to identify their neighbouring villages and to say which were wetter/dryer or hotter/cooler, it was easier to discuss the potential of farmer-to-farmer exchange visits and issues of mobility. It was much easier to use the tool after the concept was clearly explained to them.

The focus group discussions afforded the participants an opportunity to agree and disagree on claims made by other discussants. This allowed discussants to verify each other's opinions. The focus group discussions were effective as the size was small, manageable and it gave everybody the opportunity to participate effectively. The only problem with focus groups is that the random sampling procedure could end up with inactive participants, which makes discussions difficult.

The reporting guidelines were useful since they helped us to find out issues from community members and to structure this report. The reporting guidelines were helpful in facilitating the focus group discussion among both men and women.

3.0. Weather Information Session

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:

- i. To better understand how we make weather information most useful and equitable to rural women and men including the youth.
- ii. To better understand the types of weather information available to women, men and youth.
- iii. To understand how and from where women, men and youth get information on weather.
- iv. 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.
- v. 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.

3.1. Traditional indicators of weather

Both men and women mentioned similar traditional indicators of anticipating what the weather would be like. Men and women mentioned the following indicators:

- i. When whirlwind moves towards the north in the rainy season it is a sign that it will rain.
- ii. Fetching sand, throwing it in the air and determining the direction the wind blows the dust. If the wind blows towards the east, then the rainy season will soon set in.
- iii. When the Acacia trees begin to shed their leaves, 'weeping' is a sign that the rainy season is setting in. When they begin to form new leaves, it is a sign that the rainy season is ending. When the Shea and 'Dawadawa' (*Parkia biglobosa*) trees begin to flower; it is a sign that the rainy season is drawing closer. When 'Tantuli' (a type of caterpillar worms that feed on Shea leaves) shows up on the trees in greater numbers, it means drought will occur.

- iv. When 'Tilentoli' (migratory birds) begin to move towards the north around May, then the rains are about to start. And when they move back towards the south, the rains are about to end.
- v. When cattle egrets (also migratory birds) appear around October it means the rainy season has ended.

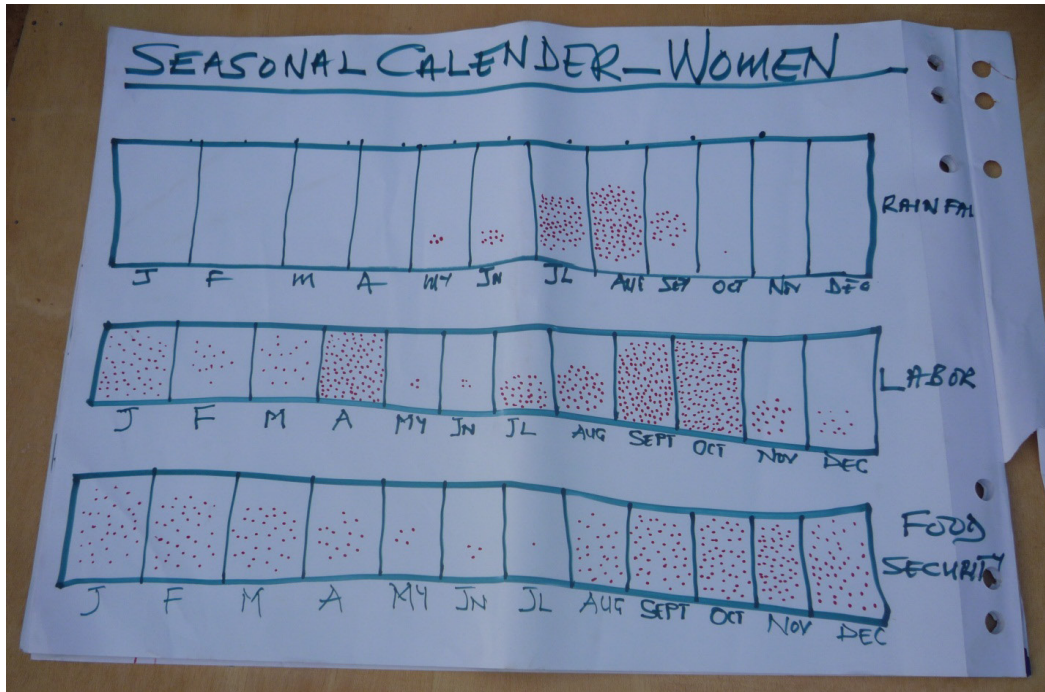


Plate 3. Seasonal rainfall, labour and food availability calendars for adult women in Doggoh village, Jirapa district, Ghana

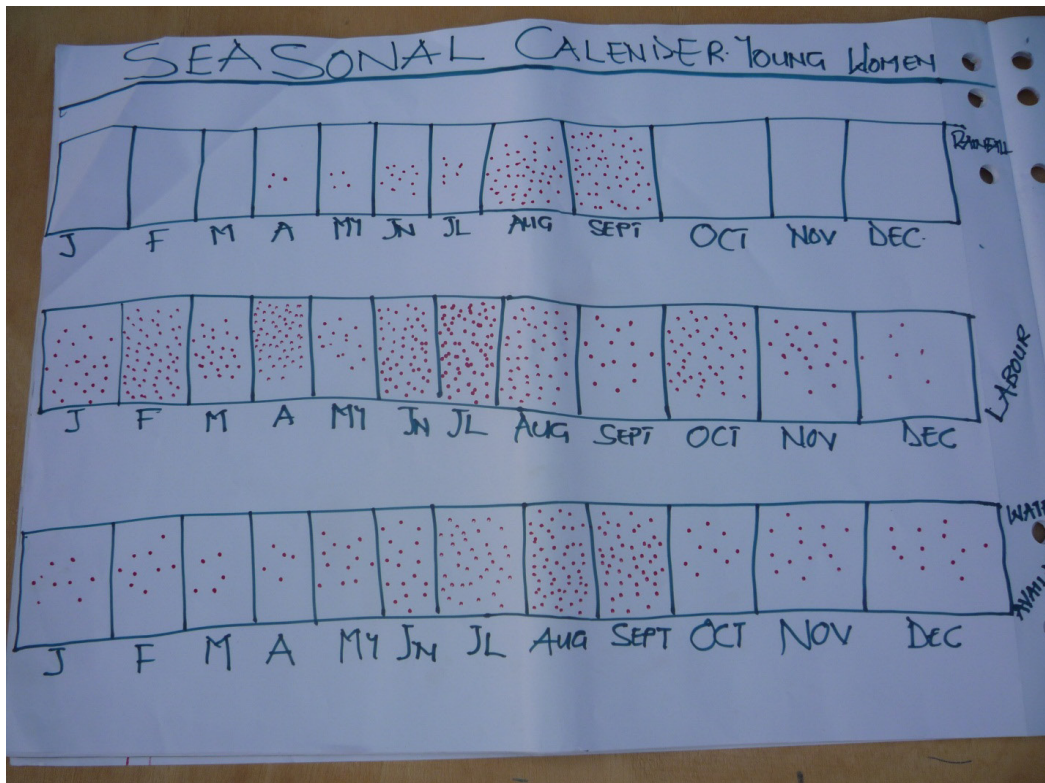


Plate 4. Seasonal calendars for rainfall, labour and water availability for women youth in Doggoh village, Jirapa district, Ghana



Plate 5. Seasonal rainfall, labour, food availability, water availability, disease incidence and income of adult men in Doggoh village, Jirapa District, Ghana



Plate 6. Seasonal rainfall, food and water availability, disease incidence, income and expenditure of men youth in Doggoh village, Jirapa District, Ghana

The men indicated that for now they rely on the traditional indicators as their main source of weather forecast since that is what they have apart from the occasional weather prediction on radio. The women also indicated that they trust the traditional methods of forecasting since that is what they relied on before the advent of formal forecasts on the radio.

3.2. Daily weather forecast received, source and by whom

Participants in the weather information session were disaggregated into adult males, male youth, adult women and women youth. It was noted that the responses of adult and youth men were similar. Similarly responses of adult and youth women were also similar. When asked if they received any weather information, the men and male youths said they occasionally received daily forecasts of rainfall and temperature. The daily forecast information is mostly received through the radio by those who own radio sets or happen to be near a radio set. Information on weather is mostly received by the men and male youths in the household since they are mostly the owners of the radio sets. When information is received on the severity of precipitation or temperature and the likely effects, the men and male youths said they share the information with other household members and friends.

Like the men, women indicated that the only weather information they occasionally received was daily weather information. This daily weather forecast information was received through the radio sets of their husbands and sons when they were at home and switched them on. This is because most women do not own radio sets and this posed a challenge to receiving weather information. The women indicated they wanted more daily forecasts and information on whether it would rain or not as this would help them plan for household chores such as collecting firewood, water, milling of flour, cooking and washing. Women said because the community was homogenous and people met and talked frequently, a lot of information, including the daily weather forecast, is shared among all community members.

All (men, women and youth) agreed that the daily forecast information they received was useful because they were able to plan their farming activities and also protect themselves and their properties. For instance, when they receive information of shorter rains, they plant early maturing varieties to take advantage of the shorter rains. Extended rainfall patterns encourage them to increase the size of the area they plant. Also boulders and heavy logs are placed on their roofs to prevent them from being blown away when they receive information on storms. Information on excessive heat is a caution to protect themselves from diseases like cerebrospinal meningitis. Hence, respondents in this community strongly trust the daily weather forecasts and radio is the most effective form of receiving information.

3.3. Seasonal weather forecast received, source and by whom

All groups (men, women and youth) currently do not see or hear about the seasonal forecast produced by the Ghana Meteorological Services. When a hard copy of a seasonal forecast was shown and explained to participants, all expressed the desire to receive seasonal forecasts because they already trust the daily forecasts they receive. Men and male youth groups would especially benefit by knowing when to plant and what type of crop variety to plant. Seasonal forecast of the on-set and end of the rainy season, how wet or dry the season would be and when the drought would occur were mentioned as

information that would help farmers plan for the whole season. The same actions taken based on the daily forecast would be taken if they received seasonal forecasts. Without giving details, women and female youth indicated that seasonal forecasts would be useful to them since it would help them protect their properties and plan their farming activities.

3.4. Preferred weather information and channels of communication

The most preferred channel by all groups for receiving weather information is through the radio in the local dialect, through church announcements on Sundays, and through the agricultural extension agents responsible for the area. All groups also suggested the weather information could be passed through the assemblyman for the electoral area. Men and the youth agreed that it would not make sense if weather information were given through the TV, mobile phone and newspapers as most of them do not have these gadgets or cannot read newspapers. Even though the daily forecast is presented on the radio and in the local dialect, which is the preferred method, the women still expressed interest in the use of the television so that they can hear as well as see. The male youth in particular asked for training on weather predications and reading of weather information.

3.5. Methods component

Although not recommended in the gender and climate change training document, discussions in each focus group started by drawing seasonal rainfall calendars as a tool (Plates 3 to 6).

The seasonal rainfall calendar did not directly address the objective of this session but helped to start a conversation about climate information. This was then followed by questions of whether there were other ways besides the traditional methods, of knowing what the weather would be like tomorrow. This was when the seasonal weather forecast from the Ghana Meteorological Services was used as a tool. Participants could not distinguish between daily and seasonal forecast. Because most participants (male, female and youth) were not familiar with seasonal forecasts, discussions on the topic were difficult as they kept referring to it as the daily weather forecast received through the radio. We then explained to participants the difference between daily and seasonal forecast.

The focus group discussions were effective since it allowed discussants the opportunity to share their experiences. The elderly were especially able to voice their opinions in this forum. The gender-specific group discussion worked out well because no group had influence over the other, and each shared their experiences without intimidation. The gender-specific approach was also useful because it brought to the fore the disparity in access to weather information. The guiding questions helped in sourcing the responses from the discussants and gave order to the way questions were sequenced.

4.0. Understanding and Catalysing Gender-sensitive Climate-Smart Agriculture Initiatives

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.

4.1. What has changed?

Men mentioned the following changes in agricultural practices over the years:

- i. Changes in varieties of millet, sorghum, maize, cowpea, groundnut and rice.
- ii. Introduction of new tree crops like mango, cashew, citrus and pawpaw and soybean.
- iii. Introduction of new livestock breeds like pigs and rabbits.
- iv. Changes in the shape of hoes as a result of changes in tillage practice and the mechanization of farming through the use of tractors to plough (flat) instead of the use of the traditional hoe to make mounds.
- v. Increased application of inorganic fertilizers due to declining soil fertility.
- vi. Increased use of agro-chemicals for weed control and storage of harvested produce.

Women speaking in a separate focus group discussion mentioned the following changes in agricultural practices over the years: They indicated that there was a gradual loss of traditional varieties of crops such as maize, cowpea, groundnut and sorghum and their replacement with improved varieties. These new varieties of crops according to the women were less tolerant to pests and diseases and were more perishable than the old varieties.

- i. The new crops mentioned by women as having been introduced were mainly vegetables such as moringa, spinach and cabbage.

- ii. The making and application of compost increased their workload.
- iii. Planting in rows instead of randomly and ploughing across slopes. The planting in rows was said to be beneficial as it reduced the workload.

4.2. Why the change in practices?

Examining what had caused the change, both men and women mentioned changing rainfall patterns over the years, declining soil fertility as a result of environmental degradation (caused by bush burning and cutting of trees), and migration to the urban areas leading to labour shortages were the main reasons for the changes in farming practice.

With regards to who decides to make the change, men said they made the decision with respect to the crop to be cultivated, where and to what extent. The men also added that women made decisions on improved crop varieties because women focus more on securing food availability in times of climate change to prevent hunger. In contrast, the women said men readily adopt new methods because “they definitely will want a bumper harvest”. It appears that women make decisions with respect to introduction of new vegetables while men make the decisions with respect to the main staple food crops such as cereals and legume.

Based on the changes in farming practices reported, the participants were asked how they learnt about these new practices. The men recounted experiences such as reducing yields caused by decrease in rainfall, declining soil fertility, and increased population due to uncontrolled births, (which may have triggered the need to learn new practices), before indicating that the extension services or “agric people” were the source of information on new methods.

Some participating women said men were the first to adopt new practices from agricultural extension agents and they in turn learnt about these new practices through their involvement in farming with their husbands. For instance, new cereal varieties were usually brought by their husbands, while they learnt compost making and planting in rows from their husbands when they took part in making the compost and were instructed by their husbands to plant in rows during the farming season. Other women in the discussion group mentioned agricultural extension agents and NGO agricultural projects in which they have been involved as the agents of change. They mentioned the provision of improved seeds, fertilizers, agro-chemicals, and training in compost making as some changes introduced by NGOs. New vegetables were mostly obtained from friends and neighbours in other villages.

4.3. Ongoing climate smart agricultural practices/coping practices

According to both men and women, there is currently no external climate smart agricultural project such as tree planting and agroforestry in the community. The men mentioned two attempts in the recent past to undertake the planting of trees and cashew, but the initiators of the project never returned to the village. However, both men and women groups mentioned a number of activities currently being undertaken at the household level as coping strategies against variable weather, drought, declining soil fertility, and striga control. Men mentioned in particular:

- i. Individuals planting trees such as mango and cashew.
- ii. Planting of improved early maturing maize, cowpea, groundnut and sorghum varieties.
- iii. Intercropping of cereals and legumes as an adaptive strategy to climate change
- iv. Crop rotation of cereals and legumes such as soybean, groundnut and cowpea to improve soil fertility.
- v. Cultivation in low land to adapt to climate change and variability.

The women mentioned the following climate smart agricultural practices to cope with climate change:

- i. Individual planting of economic trees like moringa, mangoes and plants like Aloe Vera within their homes.
- ii. Dry season gardening to produce vegetables for consumption and sale.
- iii. The making and application of compost and farm yard manure as the main sources of fertilizers on their farm lands; those who could afford to take a loan applied inorganic fertilizers.
- iv. Non-burning of bushes and crop residue.
- v. Retention and incorporation of crop residues to improve soil fertility.
- vi. Fallowing to improve soil fertility.

4.4. Institutional arrangements enabling climate smart agriculture

Both men and women mentioned similar governmental and non-governmental institutions which have operated in the past as having assisted in bringing about the above changes. The institutions include:

- i. The Ministry of Food and Agriculture (MOFA) who provide extension services.
- ii. Northern Rural Growth Programme which is a government project being implemented by MOFA. They assisted farmers with farm inputs like seeds and fertilizer.
- iii. Rural Action Alliance Program (RAAP) who provide loans and savings scheme to women.
- iv. CARE International which provides food for work and relief for flood victims.
- v. Adventist Development and Relief Agency (ADRA) who support farmers with farm inputs like improved seeds and fertilizers.
- vi. Technoserve who support farmers with fertilizers and other farm inputs.
- vii. Non-formal education that teach adults how to read and write in the local language.

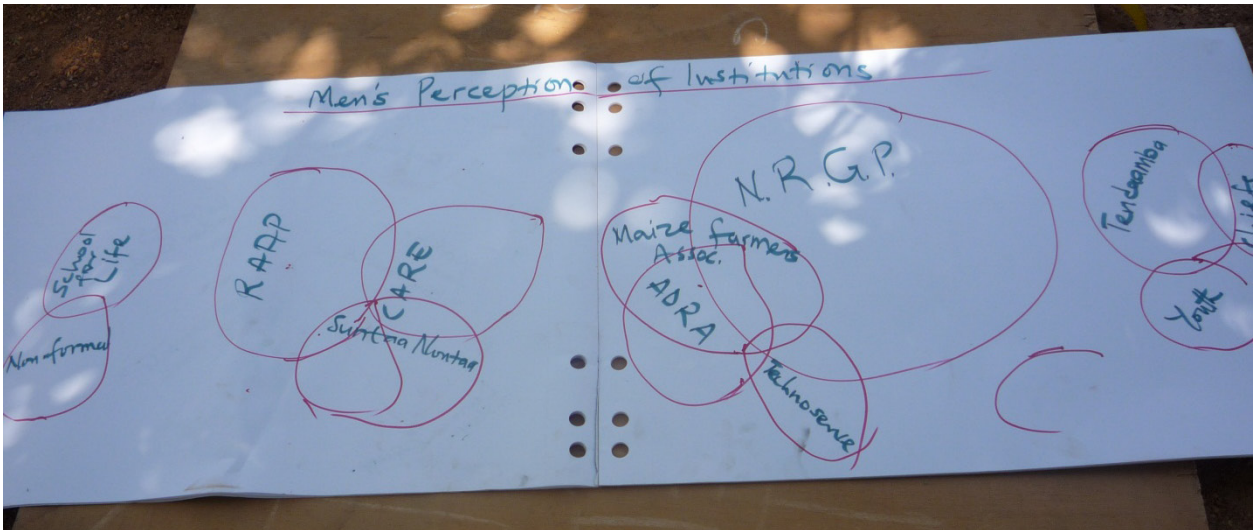


Plate 7. Venn diagram of institutions that men are involved in and their relationships

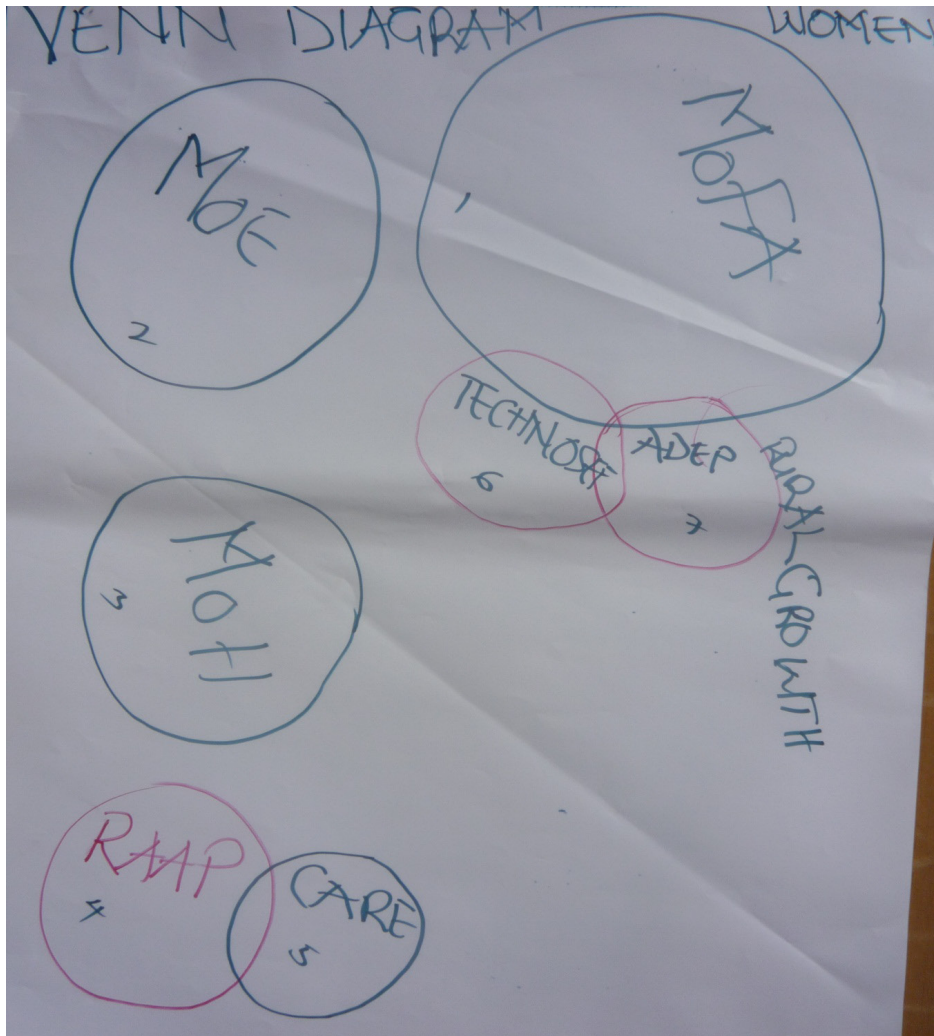


Plate 8. Women's perception of institutions and their relationships in Doggoh village

In addition to the above, women mentioned the Ministries of Education and Health as institutions who provide education for their children and health services.

Besides the government and non-governmental institutions listed above, both men and women listed the following local groups in the village that were facilitated by the above mentioned NGOs:

- i. Suntaa TietaaTietaa Nungtaa involved in credit scheme to purchase fertilizers, pay school fees etc;
- ii. Pogfaa bare gomePogfaa tietaa e-nibeKa nmi ta-nye; Poluu (labour)
- iii. Ka nmi e-nye (piggery)
- iv. Ka nmi yi-nye (credit scheme and labour; formed by MOFA).

Membership of these local groups is predominantly women but they also have some male members. This explains why the same groups were mentioned in both men's and women's group discussions. It is noteworthy that the leadership positions of these local groups were occupied by women. Activities undertaken by these local groups include crop production, piggery, and organizing labour for individual farmers for a fee. These local groups can be used as channels for climate smart agricultural activities that would benefit women directly.

4.5. Institutional arrangements hindering climate smart agriculture

The women indicated that their major problem with undertaking agricultural activities is the acquisition of land and water during the dry season. Women do not own land in this area. A woman may be given a piece of land by her husband but such land can only be used for food crops. A woman cannot invest in long-term initiatives that substantially changes land use or farming practices

Besides the land tenure system there is no hindrance to participation by women in programmes or projects implemented by the above government and non-governmental institutions. Indeed the women confirmed that they often opted not to participate in some projects because of fear of indebtedness.

4.6. Potential climate smart agricultural activities

The research team discussed potential climate smart agricultural activities that could be undertaken in the village. Both men and women expressed the desire to undertake the following climate smart agricultural activities if assisted:

- i. The planting of trees especially fruit trees like mango and moringa.
- ii. Making of nurseries was also mentioned by women.
- iii. Dry season vegetable production at their dam site.
- iv. Soil fertility improvement initiatives such as rotation of cereals and legumes.
- v. The preparation and application of compost and farm yard manure.

- vi. Implementation of minimum or reduced tillage practices e.g. no-till.
- vii. Implementation of crop residue management practices.
- viii. Introduction and use of improved early maturing and drought-tolerant varieties.

4.7. Methods component of changing farming practices

We examined the institutional arrangements allowing women to take advantage of opportunities for 'climate smart' agricultural activities, (e.g. carbon projects to mitigate emissions and improve livelihoods by adopting improved adaptation practices) using institutional analysis, Venn diagrams and guiding questions as tools. Participants in the focus group discussion were asked to list all local and external institutions in the community, activities undertaken by external agents and the extent to which women were involved or not. Venn diagrams were used to show the relationship between these institutions. Using guiding questions, participants were asked if there were any hindrances to women's participation in these projects. The facilitated focus group discussion sessions were very effective since facilitators consciously involved everybody in the discussions.

It was difficult using the changing farming practice tool because even though farmers may be making changes in their farming practices, they often did not mention these changes until prompted. For instance we observed new crops such as improved maize, groundnut, cowpea and soybean varieties, cashew, grafted mangoes, teak, and other tree crops. However, the respondents maintained that there had been no change, until prompted by these observations. New breeds of animals and husbandry practices have been adopted but farmers also do not consider that as change.

One objective of this session was to explore how institutional arrangements could be strengthened to improve access to benefits of climate change interventions. The Venn diagrams were useful in this respect as they revealed that women were involved in similar institutions as men, and therefore, benefited from these institutions (Plates 7 and 8).

The tables and guiding questions were also difficult to translate directly, often necessitating a description which in the end failed to solicit the right answer. The guiding questions could be considered as the tool for this topic in future.

5.0. Conclusions and Recommendations

5.1. Major findings

Climate analogues

- i. Men travel to communities both far and near for trade, mourning and festivals. Women only travel to nearby villages and less often than their male counterparts. Men mostly travel by foot, bicycles and lorries (in rare cases), while women travel mostly by foot. These visits are also undertaken by other members of the household apart from men mostly in the dry season where they do not have farm work to do.
- ii. Men travelled to neighbouring communities only for the reasons mentioned earlier and are not particular about observing differences in agricultural practices.
- iii. Both men and women understood the concept of climate analogues and are interested in farmer-to-famer visits to enhance their productivity.

Climate information

- i. There are traditional indicators of what the weather is likely to be in a season particularly during the on-set and end of the rainy season. The local means of weather forecast include observing certain signs in the sky, wind movements, flowering of plants, emergence of 'Tantuli' and movement of migratory birds in certain directions.
- ii. Both men and women receive daily weather forecasts mostly through the radio but do not receive seasonal forecasts. Participants trusted the daily forecasts they receive.

Change farming practices

- i. There have been changes in agricultural practices and these include the introduction of new crops such as mangoes, moringa, soybean, oranges and pawpaw. These changes have been driven largely by changing rainfall patterns and increasing environmental degradation.
- ii. There is no climate smart agriculture project in the community although individuals do undertake tree planting.

5.2. Reflections on the final public meeting

The final public meeting was well attended by enthusiastic community members (those sampled and those not). The crowd patiently listened to the findings being presented with the aid of the diagrams and charts they had drawn. There was visible satisfaction on their

faces as they listened to input and contributions of the gender-differentiated focus groups. The findings were consequently validated by all present. The final public meeting also afforded the research team the opportunity to appeal to the men to support their women who had expressed interest in undertaking future climate smart interventions, to which they agreed.

6.0. Recommendations

Based on the results of this study, the following are recommended:

- i. It is recommended that a farmer-to-farmer visit be organized for all segments (men, women, male youth and female youth) of the community to enable them get firsthand information on the improved farming practices pursued outside the community.
- ii. Both daily and seasonal weather forecasts should be provided through the radio and in the local dialect, to help the farmers plan both farm and off farm activities. The research team also recommends the use of folklore as another method of communicating weather information.
- iii. The community could be assisted to de-silt the existing dam and control the water hyacinth that is gradually spreading over it to enable them engage in dry season farming/gardening to enhance their food security and provide sustained income as a climate smart activity.
- iv. Additional climate smart interventions that could be undertaken are forestry and agroforestry.
- v. The existing local groups which mainly comprise women groups should be strengthened and used as channels for future climate smart agricultural interventions.

Overall, emphasis should be placed on creating awareness about climate change, and education and training conducted on how to combat climate change in order to empower farmers. A knowledge gap exists that has to be bridged through education. Community members showed very little knowledge of happenings around them, especially regarding climate change and its related consequences. Even though participants indicated they were experiencing changes in rainfall patterns, higher temperatures, intense sunshine and low yields, they could not explain what was causing such changes in terms of greenhouse gas emissions and how it relates to agriculture. There is need for further research into effective ways of communicating climate change and its consequences to community members, livelihoods, environment, crop varieties and animal breeds.



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