

## **Technical Report of gender and climate change project in Kyengeza and Gosola villages in Lwanda Sub county, Rakai district.**

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### **1. Introduction**

In Uganda, recent climate trends show that the mean annual temperatures have increased by 1.3 C since 1960, with an average rate of 0.28 C per decade (Oxfam, 2008). Recent trends in precipitation indicate that annual rainfall has decreased at an average of 3.4 mm per month and 3.5% per decade (McSweeney, et al., 2008). Further, the droughts that periodically affect the Western and Northeastern districts of Uganda are becoming more frequent (NAPA, 2007). In recent years, most areas have received increasing erratic onset and cessation of the rainfall and when the rain falls, it is heavier (Oxfam, 2008). According to the 2<sup>nd</sup> UN World Water Development Report (2006) and the Uganda Energy Sector Report (2007), water related disasters such as droughts, floods, landslides, wind storms and hail storms annually destroy an average of 800,000 hectares of crops making economic losses in excess of UGX 120 billion (USD 48,000,000) (Exchange rate 1USD = 2500 UGX) in Uganda.

Like most developing countries, the economy of Uganda is dependent on rain-fed agriculture. This implies that adverse impacts of climatic change could be a major constraining factor in terms of agricultural production. The effects of climate change on livestock production systems are enormous and translate into limited feed and water scarcity for livestock. The end results are reduced feed intake, low live weight gains, low milk yields and consequently food insecurity. This study was designed with the following objectives:

1. To understand how men and women crop - livestock farmers in Rakai perceive concepts of climate change
2. To determine how climate change affect crop - livestock production by women and men farmers in Rakai district

3. To determine the different coping and adaptation strategies used by women and men
4. To evaluate simple adaptation technologies on farms of women and men
5. To disseminate project results to more women and men farmers, extension staff, National Agricultural Advisory Services ( NAADS), policy makers, Non Government Organization (NGOs) and community based organizations (CBOs)

To meet the first three objectives, a qualitative study method was used. Focus group discussions with female and male crop-livestock farmers were conducted separately. Women groups were facilitated by a female facilitator and female note taker. The men's groups were facilitated by a male facilitator and male note taker. The focus groups were complemented by key informant interviews with district officials, and community and farmers' leaders. In addition, observations were made and secondary information reviewed.

## **2. Progress on setting up research**

The study started with a planning meeting with the District officers and conducting a reconnaissance trip of Rakai district. This was followed by meetings with field extension staff at the sub county, sub county chief, Local Council 3 chairman and farmers' leaders. Mobilization of farmers was done by the area field extension staff and farmers' leaders. Farmers were told that our work is not new to the area and we will build on the work which was already started by CCAFS. Farmers were informed that our work was purely research to generate information that can help to plan for future adaptation of their area and Uganda at large.

### **Challenges in setting up the research**

#### *Selecting study site*

Originally, the study was proposed to be conducted in Kumi district; however, it was changed to Rakai where CCAFS had conducted the baseline study. This was accepted but on signing the contract, the original proposal with Kumi as a study site was appended on the contract. This attracted audit query as implementation of work started in Rakai. Time was lost as this issue was being sorted out.

The research team selected Kakuuto Sub County, which has the highest numbers of livestock and the biggest problem of drought in Rakai. But again this was out side CCAFS study site, so the research team had to go to Lwanda Subcounty where CCAFS study site was located.

### *Timing of the baseline study*

The baseline study coincided with the beginning of rains in Rakai. This is the period when farmers are very busy planting their crops. It was a bit difficult to convince them to sit with researchers for a long time. A strategy was developed, to meet each focus group for two alternative days.

### *High expectations of farmers*

Because of NGO activities in the area of study, farmers are used to getting hand outs from NGOs. So for every project which starts in the area, farmers think of getting material things. This was resolved by explaining to the farmers that the purpose of the project was purely research.

### *The livestock production system, small land holdings and gender issues*

Establishment of on –farm trials was planned to be set on four farms of women and four farms of men in each village. But this was not possible mainly because of the communal grazing and tethering production systems practiced by the farmers on the communal land. Most farmers have small land holdings where they grow their crops. The animals are mainly grazed on the communal land. So allocating land to grow forages especially by women was difficult. Few women were found to own/control land in their marital homes in the study area and have little say on allocation of land to crop production. Thus, in this study three trials were established by three women and eight men on their farms in Gosola and Kyengeza villages.

### *What has gone smoothly and why?*

The current study was conducted very well. The data was collected through focus group discussions and key informant interviews. Also interventions were established on farm.

There was no any logistical difficulty. I have also been monitoring the project budget and expenditures are within my plan.

## **3. Research Methods**

### **Methodology**

The study method was mainly qualitative. The study started with a planning meeting with the District officers and Reconnaissance of Rakai district. This was followed with a meeting with the supervisors at ILRI and ICRAF in Nairobi, Kenya.

A planning and preparation of the inception meeting at Lwanda Sub County with the Sub county staff was conducted.

An inception meeting was held at Lwanda Sub County with the farmers, district and Sub County Officials, NGOs and researchers to introduce the project to the farmers.

Study instruments were developed and two notes takers and one facilitator were trained.

Farmers were selected and the data was collected.

### **Study Area**

The study areas selected were Kyengeza and Gosola villages in Lwanda Subcounty.

Kyengeza village was already selected by CCAFS. Gosola was selected in a meeting with the extension staff at Lwanda Sub County using the following criteria:

1. The village participated in the earlier CCAFS survey
2. There were some NGO and NAADS activities in the village
3. It has the highest number of livestock among the seven villages which are part of the CCAFS baseline survey.
4. It receives least and unreliable rainfall among the seven villages, which participated in the baseline study and suffer a lot from drought.

### **Farmers' selection**

The extension staff, farmers' leaders and Local Council 1 chairmen listed farmers who cultivate crops and raise livestock (cattle, goats, pigs, sheep and chicken) in Gosola and Kyengeza villages. From the Kyengeza list, 24 women and 24 men were randomly selected by the researchers for participation in the focus group discussion at Kayayumbe Secondary school. The women were split into two groups each group composed of 12 women. The men were also split into two groups each group composing 12 men. Each group of women met with the female researcher and note taker to conduct focus group discussion for two alternating days. Each men's group had a focus group discussion with male facilitator and note taker each for two alternating days.

In Gosola 15 men and 16 women were randomly selected from the farmers' list. In this village the team conducted one focus group discussion with the women for two days and one focus group discussion with men for two days. Every day each facilitator met with the notes taker at the end of the day to compile the information from the focus group discussions.

The following topics were covered in the focus group discussions:

1. Perception of farmers about climate variability and change
2. Climatic hazards in Kyengeza and Gosola
3. Effects of climate variability and change on crops and livestock production
4. Gender role in the different crop and livestock production systems
5. Coping and adaptation strategies

Tools for research included

1. Seasonal calendar
2. Historic time line

3. Production trend and coping strategy matrix
4. Capacity and vulnerability analysis
5. Vulnerability Analysis
6. Venn Diagram on Institutions in Kyengeza and Gosola villages
7. Gender role analysis
8. Pair wise ranking

In addition, key informant interviews were conducted with the District Agricultural Officer, District Forestry Officer, District NAADS coordinator and one farmers' leader from each village. Furthermore, secondary back ground information was collected from the district head quarters.

### ***Research Interventions***

A number of interventions were established on farm. Female and male crop-livestock farmers who hosted the on-farm trials were selected by their farmers groups with guidance from the extension staff. Interventions were planted on four farm of men in Gosola and two farms of women. In Kyengeza, interventions were planted on one woman's farm and four mens' farm.

The following interventions were established on farm:

1. Bracharia Mulato
2. Gliricidia
3. Calliandra
4. Mucuna
5. Maize/ lablab intercrop.

For maize lablab intercrop, longe4 maize variety was intercropped with lablab.

In addition to this, four underground water harvesting tanks were established on four farms using tarpolin. Three harvesting tanks were established in Gosola, two were put on women's farm and one on a man's farm. One underground tank was established on one woman farm in Kyengeza.

Furthermore a demonstration trial was established at the District Agricultural Training and Information centre (DATIC) in Rakai district.

The following were planted:

Maize (longe4)lablab intercrop

Giant panicum

Bracharia Mulato

Choloris Gayana

Calliandra and Gliricidia

These were replicated 3 times

The plot size of grasses is 8 m X 5 m at a spacing of 1m x 1m

The plot size of maize lablab intercrop is 10m x 10m at a spacing of 1m x 1m.

The Gliricidia and calliandra were also planted at spacing of 1m x 1m. There are 2m in between the plots.

### **Challenges of using the tools**

The challenges in using the tools were mainly on production trends and coping strategies matrices. Farmers could not remember specific yields of different crops and livestock over the past years.

Another challenge was on using vulnerability and capacity analysis matrix. The tool was not very clear to the facilitators, and therefore, its implementation did not go very well.

The rest of the tools worked well and the required information was got.

### **4. Analysis of Findings**

Most of the information collected was synthesized, some of which are described below.

#### **(a) Weather changes**

According to the women and men focus group discussions, the rain pattern in Kyengeza is not consistent as it used to be in the past. One season, the village gets enough rain and the next season, they do not get enough rain. For example last season (September to December 2011) the maize and bean crops dried off before they could mature. Sporadic rainfall leads to crops not getting enough water as they do not mature and lead to food scarcity, and water and pasture shortage (DDP 2011).

*Case 1 Women's group*

*Beatrice Naseje an 85 years old lady revealed that in the 1960s there used to be enough rain because there were forests in the village. But because of deforestation, droughts increased. However, young ladies in their early twenties said that they started seeing changes in the rain fall pattern and drought in 1997 and 1998.*

Case 2 Men's group

*Mr. Kayondo George 72 years said that from 1958 to 1960s they were receiving enough rainfall. From 1970 to 1972 there was a decline in amount of rain which they received. While from 1989-1991 there was an increase in rainfall. From 1995 -1999 they had heavy shower which brought floods and banana and coffee plantations got affected and dried. This phenomenon resulted into a serious famine. The famine extended 2000 up 2003.*

The following major weather extremes were identified in Kyengeza by both men and women focus groups:

1. Prolonged drought from the usual dry season of 2 months to 6 months of drought.
2. High temperatures
3. Heavy winds and storms
4. Hailstones

Case 3

*Women group 2 in Kyengeza told the research team that during the last season the drought was extreme. Temperatures were very high. The village had one month (January) without rain at all. The dry season started in December 2011 and continued up to late February 2012. There was no rain for coffee, which led to deaths of coffee flowers. Even mangoes did not flower at all and the village has had no mangoes this season.*

*During the dry season there was strong wind which made bananas trees fall down. Because the banana plants were weak due to the impact of drought, they were also susceptible to diseases.*

*Maize became stunted when the rain stopped early unexpectedly. Those who did not apply fertilizers were especially affected. But for those who applied fertilizer, the maize was good and had high yield. They used to harvest a bag of beans but during the previous dry season they harvested only 2- 3 tins of beans.*

According to the women and men focus group discussions, the prolonged drought and high temperatures in Kyengeza village have brought about the following shortages:

1. Scarcity of water

2. Shortage of food and pastures of animals
3. High disease incidences of humans, plants and livestock

#### *Scarcity of water*

Prolonged drought led to drying of wells and people travel long distances (between 2 km and 5 km) to look for water from a bore hole. The women, who mainly fetch water for domestic use, wait up to 8hrs at the bore hole to collect water. There is only one functioning bore hole that serves a very big community of approximately 4000 people from Kyengeza, Kikakata, Kitonezi and Kiwanguzi villages.

Another alternative is for women to go to the drying well where water becomes dirty quickly. In order to get clean water, women go to the well as early as 5.00am and usually come back at around 9.00 am. This puts women's life at a risk of traveling alone at night and also adds onto their time. The women fetch water for human and animal consumption. Each cow requires 20L of water per day. And each household has one to five animals.

#### **(c) Crops**

The types of crops grown in Kyengeza included the following in order of importance. These were ranked using pair wise ranking.

1. Bananas/ matooke
2. Coffee
3. Beans
4. maize
5. Cassava
6. G. nuts
7. Tomatoes
8. S. potatoes
9. Irish potatoes

Bananas are ranked the highest because of their cash value compared to other crops. Bananas are also part of the staple meal, and therefore, are important for a family's food intake. Coffee was ranked second because it brings in much cash. Beans were ranked 3rd important because there are eaten, farmers get money from it, and produce yields quickly compared to coffee. Maize was ranked fourth because it is used as cash and food crop. Irish potatoes take long (2 months) to get spoilt. Farmers also leave it in the garden and wait until the prices are good and then they harvest them. Cassava and maize flour are eaten during the dry season when bananas are scarce. Groundnuts are better than Irish potatoes because Irish potatoes do not grow very well in some areas.

#### **(d) Livestock**

Livestock was ranked using pair wise ranking. The major livestock kept in order of importance include;

1. Cattle
2. Pigs
3. Goats
4. Chicken
5. Sheep
6. Turkey

Cattle were ranked first and the most important because farmers get cash, milk and manure from it. Pigs came second because they grow quickly in 6 months and when sold, they bring in quick return and fetch higher price than goats which take 2 to 4 years to mature.

For chickens, farmers get cash from eggs and birds. Chicken can lay eggs 6 times a year.

#### **5. Effects of climate change and variability on crop-livestock production by men and women and their coping and adaptation strategies**

##### **(a) Cattle and Pigs**

From the group discussions, women, men and children are engaged in tethering and milking of cows (table 1). In most cases its women who fetch water for home use and for animals. Water shortage a result of drought affects women most as they have to search for water in order to maintain their homes. They travel long distances, spend much time looking for water, and travel at night to fetch water, putting their lives at risk. In open grazing, it is mainly the men who graze and water the cattle. Children and women only clean the kraal. During drought when pastures and water are scarce, men migrate with their animals to other places, such as Sango –bay to look for water and pastures.

Pigs (as well as goats and chicken) are mainly looked after by women (table 2) and any climate variability which affects pig, goats and chicken production directly affects the women. For instance, water shortage, food and pasture shortage that affect the livestock mentioned reduce women's income earning opportunities by selling these animals, especially if women own them. It also undermines the food security of the affected households.