Strategic choices for enhancing capacity of rural communities adapt to climate variability: *A case for Uganda*

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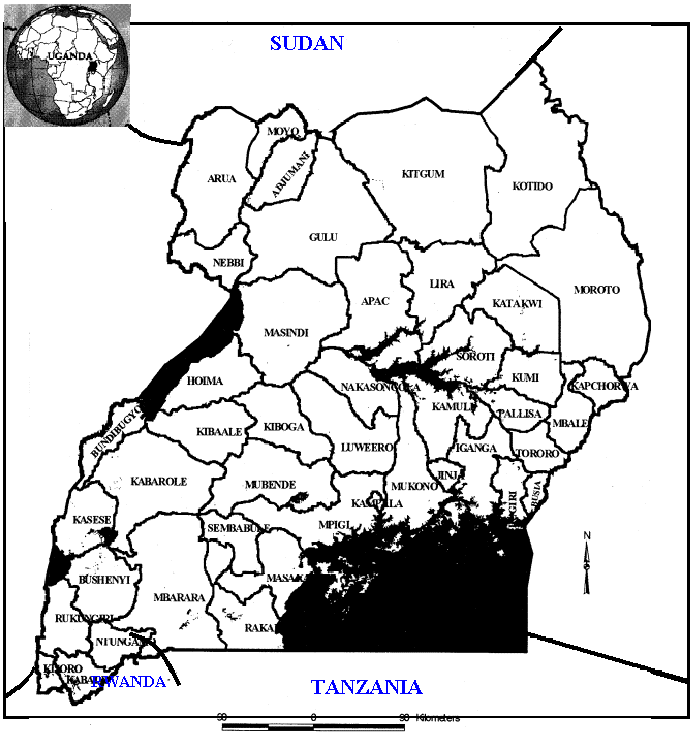
1.0 Introduction

Uganda is a developing country located in Africa with a human population of 24.7milliom as per the 2002 population census. The country is located in the heart of Africa and equators passes across it.

Its location at the equators make the country experience a bi-modal rainfall pattern in central and southern parts, while in the northern areas a mono-modal rainfall is mostly experienced.



The majority of the population resides in the rural setting where they derive their livelihoods from a rain fed agriculture system. The dependency on a rain fed production systems makes the

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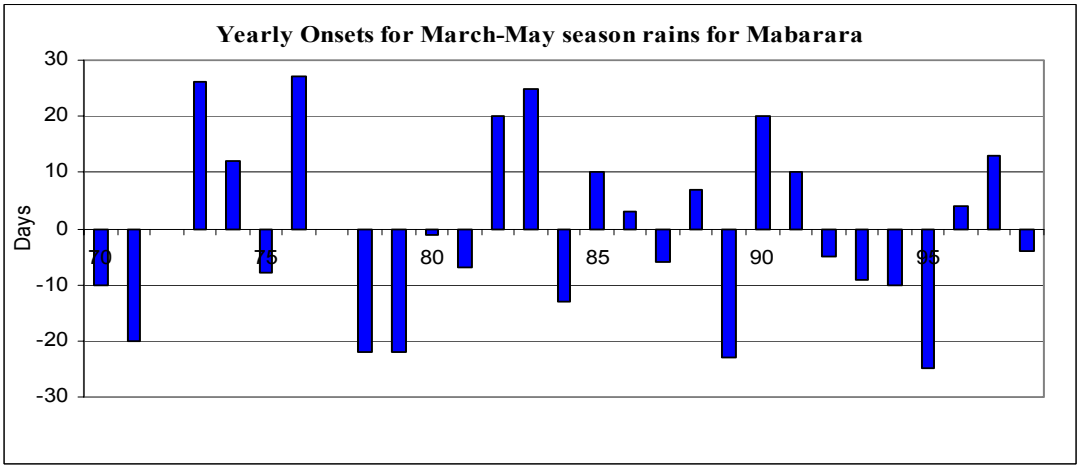
2.0 Climate Variability in Uganda

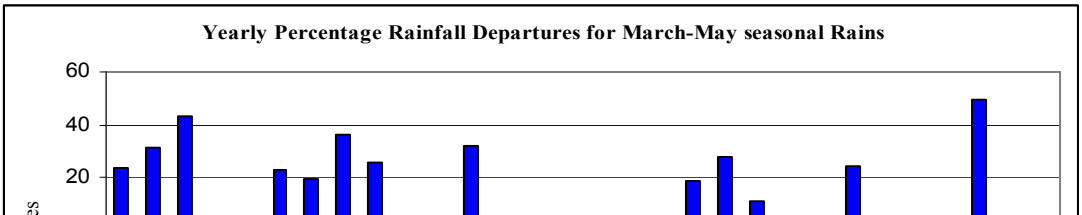
Climate variability can be understood in terms of the yearly changes in when the seasonal rains start and the rainfall amounts as shown in graph 1 and 2 respectively.

2.1 Start of Seasonal Rains (March-May)



Though the seasonal (March-May) rains on average may begin at the beginning of the month of March, the above graphs shows yearly changes in onsets. The rains may begin as early as middle of February, and late in the middle of the month of April. The variability ranges from 24 days early to 28 days late. Not knowing the right time to plant in advance may lead disastrous consequences to the farmer.

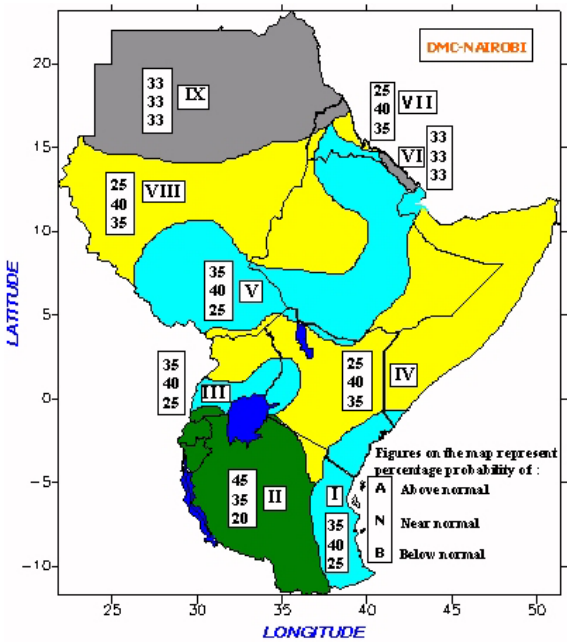
2.2 Seasonal (March-May) Rainfall Amounts



The graph above shows that rainfall amounts for the season (march-may) varies from year to year. While the average rainfall amounts for the station is 264mm, this can vary by –64% below average and 50% above normal. The variability of the start and amount of the seasonal rains has a big impact to communities that depend on rain fed agriculture systems.

3.0 Provision of Climate Advisories

Examples of Climate forecasts



Regional Forecast Horn of Africa sub region

There is increased likelihood of near-normal rainfall over most of the Greater Horn of Africa sub region for the period March-May, 2001. However, probabilities are favoring above-normal rainfall over Burundi, Rwanda, and most of Tanzania.

Forecast provided by the drought Monitoring Center Nairobi 14-16 February 2001 with support by WMO,USAID, NOOA/OGP

4.0 Enhancing Rapid Information Dissemination at Community Level Through Radio and Internet (RANET) *RANET IS SUPORTED BY USAID, NOAA/OGPACMAD*

In May 2003, RANET UGANDA identified by UNDP as a project with BEST PRACTICES. Below is an extract .

4.1 Introduction

Climate and weather play a vital role in many human activities such as agriculture, energy, production, disaster mitigation and health. Technologies and scientific advances in recent decades have not only provided us with a good understanding of the climate and weather but also a large variety of observations and forecasts that can help in our efforts to manage systems sensitive to meteorological events. Although such information is not exclusive in managing disasters, it is very useful in mitigating losses.

There is great need for a mechanism to provide timely and advance information to the local communities in dryland areas to help them plan for appropriate interventions to prevent or avert impending disasters. In the same way, forecasting production of the main food crops and livestock is an essential outcome of such mechanisms for planning. This can be achieved through collecting, analyzing and interpreting data/ information on crop and livestock production, marketing, pricing and stocks in the affected areas. For this information to be useful to the rural communities in drylands, it should be simple, properly interpreted and disseminated in a timely and effective fashion through appropriate media.

4.2 Description of the practice

Radio and Internet (RANET) project is an example of a practice that enhanced collection and dissemination of early warning and climate information at the local level through Radio and Internet. The practice is implemented in Nakasongola district and is implemented by World Vision in collaboration with the Department of Meteorology. It provides timely information on climate and other development information for the people in the district. The equipment consisted of a Computer, World Space Modem, World Space Receiver and Antenna. The World Space Receiver was connected to the World Space Modem. The modem was also connected to the computer. The equipment used the African Learning Channel (ALC), which had two components: ALC – Data and ALC – Audio. The computer used the World Space Client Service software to down load the required information. The antenna was set facing western direction (Gabon channel) where the satellite is located.

The Programme had 4 components:

1. **Information gathering** – The meteorological center at Kakooge gathered climate information in Nakasongola and forwarded it to the Meteorology Department. The Meteorology Department synthesized the information and also

forwarded it to the satellite managed by the African Center for Meteorological Application for Development. This process is called uploading.

1. **Transmission** – The World Space Modem downloaded information from the satellite using a World Space Radio and a Computer. The downloaded information was grouped by region combining several districts. Effort was being done to have information processed separately for each district.

3. **Interpretation** – The down loaded information was simplified to enable utilization at the local level. Through translation, there was loss of accuracy, because terminologies do not mean exactly the same in different languages, e.g. season, % accuracy. The downloaded information is about 70% accurate.

4. **Information dissemination** – The World Vision structures in Nakasongola were used to disseminate the information about food security, weather, early warning systems etc. to the users.

Downloading was normally done on Thursdays to get complete downloads. ALC – Data – View was used to view the downloads on the PC while with ALC – Audio, the information could be listened to on the World Space Radio.

A technician demonstrates how to operate the RANET system

4.3 Ways in which the practice was successful

- The practice succeeded in collecting and disseminating climate information to local farming communities in a timely manner. In the case of RANET project, the local communities in 17 parishes of Nakasongola district benefited from the practice. This was possible because of the easy access to weather information through the Internet, and the established local structures for interpretation and dissemination of the information. The timely dissemination of information enabled the local population to improve the state of drought preparedness and food security.

- The practice also improved the efficiency of planning taking into account more accurate climate forecast. For example, more farmers in Nakasongola started preparing their land for cropping in advance banking on predictions received through

RANET. This contrasts with the past when almost all farmers waited for rains before land preparation. In general, this improved productivity of crops and livestock.

- There was a clearly registered success in better disaster preparedness as a result of the practice. The detailed discussion of application of weather information through established grassroot structures improved the development of country disaster preparedness plans and measures undertaken by various actors to avert disasters. This reduced the vulnerability of the population. An example of this was the high level of readiness for the *El-Nino* predicted in 2002 where people were informed and got prepared. As such, there was very minimal damage caused to life and property.

- The practice provided a variety and wide range of information relevant to the development of the local communities through efficient use of the Internet. For example, RANET in Nakasongola also provided information on HIV/AIDS, markets, health, education, etc. The information was integrated with climate forecast information and disseminated to the communities in a package form.

- The practice established a data and information collection system whereby food security and production information is regularly collected and compiled for use in local planning and shared with other stakeholders through the RANET project.

- The practice also built capacity of the community to interpret weather information for the benefit of the area. In Nakasongola, NGOs and local government departments were trained in accessing information from the RANET.

4.4 Special features to which success is attributed

- Access to fairly more accurate satellite data through Internet made forecasts more reliable. This increased confidence and dependency of the beneficiaries on the information generated.

- The practice built on local structures linked to the elected LCs starting at village level. The practice used these structures to interpret and disseminate climate and weather information, making it easy to disseminate and useful in addressing local needs. In the case of RANET in Nakasongola, the World Vision structure that included LCs starting at village level, successfully disseminated the information to the communities.

- The ability of the practice to translate sophisticated weather data collected through satellite into simple usable information relevant to communities in the district was another feature responsible for the success of the practice.

- Deliberate effort to target women and youth groups is yet another strategy of the practice that ensured that weather information is appreciated and used by all genders, especially those most involved in agricultural production and natural resource management. Since women are the sex most involved in farming, the practice

deliberately targeted them because they needed this information to make certain decisions.

- The participatory approach to interpretation of the weather information and data through Area Development Committees ensured relevancy of the information to local concerns. It also built the capacity of the community to interpret and disseminate the information as well as its application in planning and disaster preparedness.

4.5 Why the practice is instructive to others

- Reliable weather and climate information is very crucial for making decisions regarding production, especially in the drylands. The practice enabled local communities to access more reliable climate information in time using relatively low cost equipment (PC, World Space Modem, World Space Radio and Antenna), with one set capable of serving the entire district. The effect of this practice could even be greater if linked to an operating FM radio network.

- Training of required personnel to run the practice was available locally through the Meteorology Department and World Vision.

- The practice provided early warning information and a mechanism for preparation of drought and disaster preparedness plans to help reduce the vulnerability of local communities in drylands to drought and other disasters.

4.6 Constraints and possible improvements

Since the practice was still new to the district, the local people (information users) were still testing the technology. The people initially treated it with suspect, until it was proved beyond reasonable doubt. The loss of accuracy in translating the information to local languages calls for capacity building of the interpreters and users of the technology, which was still lacking. In addition, grouping the information into regions led to loss of accuracy, making the information suspect. Even if information was got only for Nakasongola district, the weather station was at Kakooge, which was not very representative of Nakasongola district. Kakooge was more inclined to Luwero district. Translating it into local languages for every one to understand, and also incorporating indigenous knowledge into the practice would improve relevancy of the information.

5.0 Climatic Research responding to users climate information Needs

Increasing Application of Modern Seasonal Rainfall Forecasts by Rural People through Understanding the Traditional Methods of Rainfall Forecasts.

(Research Supported by NOAA/OGP and DMCN)

Abstract

Farmers in Soroti region were interviewed to investigate the major rainfall indictors they use during the dry season Jan-March to forecast the 1st seasonal rains (March-May). Statistical analysis using SPPS software, reveal the winds as the major rainfall indicator followed by clouds, trees, birds and temperatures. Winds and temperatures are common weather elements that farmers and meteorologists observe. Results further show that farmers in Soroti region associate strong winds blowing westwards during the dry season with late onset of March-May seasonal rains while winds blowing eastwards with early onset. Farmers associate low temperatures with early onset while high temperatures are associated with late onset. Historical records (1992-2003) of daily rainfall, wind speed and direction, maximum and minimum temperatures for Soroti weather station, were used to validate the farmer's knowledge of these rainfall indicators.

Rainfall onset dates for the years 1992-2003 were analyzed using INSAT software. Average 5 day maximum and minimum temperatures and wind speed and direction for the first 90 Julian days were developed and correlated with rainfall onset dates. The wind speed of the Julian days 1-8 showed a strong positive(r=0.84) with onset periods. This suggests that the stronger the winds speed the later the seasonal rains start. This coincides with the farmers' observations. Maximum temperatures for the Julian days 1-8 had strong negative (r = -0.86) relationship with onset periods, implying the hotter the temperatures, the earlier the seasonal rains start while the cooler the temperatures, the later the season start. However during the Julian days 71-79, the maximum temperatures and onset dates have a strong positive (r = +0.80) relationship, which coincides with the farmers' observations.

The local maximum temperatures and wind speed for Soroti region may be used to forecast onset dates for March-May seasonal rains ahead of 1-3 months. Secondly farmer's observations could be used to improve on the scientific climate information services

RECOMMENDATIONS:

- Meteorologists should take efforts to improve on the farmer's knowledge to build their capacity to make local specific forecasts,
- Develop local specific models to forecast onset of seasonal rains using local maximum temperatures and wind speeds.
- Replicate the research study for other regions with long historical data.