University of Hohenheim

Institute of Social Sciences in Agriculture

Department of Agricultural Communication and Extension

Master Thesis related to the module

"Rural Communication and Extension" (4301-430)

Prof. Dr. Volker Hoffmann

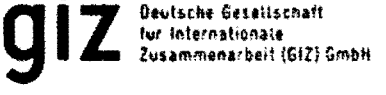
Using Seasonal Weather Forecasts for Adapting Food Production to Climate Variability:

A survey of agricultural households in the Sio-Malaba-Malakisi River Basin of Uganda

submitted by

Hanna Julia Ihli
Ina-Seidel-Str. 23
72770 Reutlingen

Stuttgart-Hohenheim, April 2011



This work was financially supported by the Foundation fiat panis and the German International Cooperation (GIZ) GmbH, Germany

8 Executive Summary

In the past, Ugandan communities knew their local climate well and it was more predictable. Annual seasonal variations, particularly the onset and cessation of rains were minimal hence seasonal weather forecasts did not make any difference. However, today the situation is different since climate variability, as well as frequency and intensity of weather and climate events increased. The availability of timely weather and climate information may enable farmers to make better farm decisions.

The presented Master thesis investigates the role of seasonal rainfall forecasts as a strategy for adapting food production to climate variability in farming households in the Sio-Malaba-Malakisi (SMM) River Basin catchment of Uganda. In detail the provider side of weather information i.e. seasonal rainfall forecasts, as well as the user side of weather forecasts is explored, assessed and analyzed. Thereby the essential research questions are: What trend in climate variability can be identified in the region and what are the impacts on food production? What are farmers' weather information needs? What is the actual use of seasonal weather forecasts? What gaps exist between weather products and these needs, and what are principal measures by which these gaps can be addressed? To answer these questions, information and data collection included semi-structured interviews with a variety of stakeholders who are involved in the generation, use and dissemination of weather data and information, as well as a household survey covering Butaleja and Tororo district in the SMM River Basin catchment.

In the first section of this thesis (chapter 2) the agricultural sector and the climatic conditions of Uganda, as well as climate variability and impacts on agriculture are reviewed. Further, agricultural meteorology and its applications are elaborated. The agricultural sector supports most of the livelihoods in Uganda and is heavily dependent on rainfall performance as agriculture is mainly rain fed. The agricultural sector performance is severely compromised by climate variability, which has started manifesting itself through increased frequency of extreme weather events such as droughts and floods. A foreknowledge of the weather of an upcoming growing season enables farmers to plan farm operations with greater confidence and to make better decisions. To be useful certain prerequisites are required: Forecasts need to be skilful, timely, credible, relevant to actions, which potential users can integrate into production decisions to improve potential production outcomes, presented in simple, understandable language; transmitted in local languages.

In the second section (chapter 4) weather and climate data generators, meteorological products and services, as well as the delivery of weather and climate information to end-users were elaborated. The Department of Meteorology (DoM), the Directorate of Water Resources Management (DWRM), as well as the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) can be identified as key weather and climate data generators in Uganda. These state institutions provide weather and climatic advisories to various stakeholders in the agricultural sector in form of seasonal rainfall forecasts, agro meteorological bulletins, and message to farmers brochures.

However, various constraints of the issues relating to the generation, management, access, exchange and delivery of weather data and information have been identified: lack and improper use of basic meteorological instruments, unreliable and delayed transmission of weather forecasts, declining number of meteorological stations, not validated seasonal rainfall forecasts, and lack of staff. Budget cuts and a lack of funding have been identified to be the main reasons for the problems.

The third section (chapter 5) investigates access, information transfer, and use of weather forecasts as well as the farmers' point of view on it. Further, prevailing agricultural activities, the occurrence of droughts and excessive rainfall/floods and effects of these events on food production were assessed. Farmers receive daily forecasts mainly through the radio and seasonal forecasts from agricultural extension workers. They use seasonal rainfall forecasts to guide their decisions and to make adjustments to their farming activities. The key adaptation strategies include: drought tolerant crops, short-term varieties, rainwater harvesting, soil and water conservation through reduced tillage, and specific timing of planting and harvest, in case of a drought; crops with high water requirements, long-term varieties, protections such as trenches and channels, and specific timing of planting and harvest, in case of excessive rains. However, farmers face a number of constraints that limits their ability to use forecasts. Major limiting factors include: mismatch between traditional and modern forecasts, unreliable, imprecise, and too general forecasts, delayed and too technical forecast, forecasts in a not understandable language, as well as lack of faith in forecasts. Household perceptions of crop yields of main staple food crops and livestock population trends depict a decreasing trend. The study region has experienced droughts and excessive rains/floods over the past 10 years. These events had a number of negative impacts on farming households. The impacts include: reduction in crop yields, yield decline due to lack of water, yield decline due to crop being washed away and water logging, low livestock production and productivity as well as food insecurity. Additionally, excessive rains/floods resulted in increased pests and diseases for both crops and livestock. Droughts resulted in lack of livestock feed and water.

In the forth section (chapter 6) conclusions are drawn regarding the research objectives and the underlying hypothesis. Regarding the underlying hypothesis that successful application of seasonal rainfall forecasts in farming can be applied as an adaptation strategy to forestall the negative consequences of climate variability which in turn result in better farm decision-making, the following conclusion can be drawn. The hypothesis can neither be proven nor rejected. Farming households in the study area use seasonal rainfall forecasts and adapt farm operations. However, before seasonal forecasts result in an improved outcome several conditions must be met. Forecasts must be of value, but to date the seasonal forecasts have not been validated. The quality of the seasonal forecasts of the DoM is unknown. Therefore, it is difficult to say, whether it results in better farm decision-making and in an improved outcome.

In chapter 7, recommendations are elaborated for improving the access and use of seasonal weather forecasts, as well as the communication of forecasts to farmers so that the potential benefits offered by this adaptation measure might be realized in farming households in Uganda. An outlook for further research is also given.