

# Improved access to climate information reduces crop loss and damage in Uganda

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## What is the issue?

The ecosystems and livelihoods of the Ugandan population are threatened by climate change, which is manifested in escalating droughts, floods, and variability in the seasons. The cattle corridor, which covers 40% of Uganda's land, is prone to recurrent droughts and is one of the areas most affected by climate change and variability in the country (NAPA, 2007). Farmers here receive little or no relevant information to help them cope with drought and other climatic stresses.

Using information and communication technology (ICT) tools, the IDRC-funded *Climate Change Adaptation and ICT (CHAI)* project provided adaptation information in local languages in three intervention districts, including: seasonal weather forecasts and agricultural information localized to sub-county level; weekly livestock and crop market information to help farmers decide what, when, where and how much to sell; guidance on low cost rainwater harvesting techniques; information on drought and flood coping mechanisms; and termite control measures. The project aimed to assess how improved access to such information enabled farmers to take appropriate actions, such as planting early maturing crops to minimize the impact of climate variability and change.

## What did we do?

To assess the climate adaptation information and communications needs of communities, a review of literature and a baseline survey were conducted in the intervention districts of

## Key messages

- The top hazards affecting Uganda's cattle corridor communities are: drought and prolonged dry spells, unpredictable rainfall, and floods. These hazards have impacts such as loss of crops and livestock, increased food prices, diminished health of livestock, and reduced household water supply.
- Temperature and rainfall are projected to increase between 1.4 - 4.2°C and 8.7 - 31% respectively by the year 2100, which will exacerbate the frequency and intensity of climate hazards (namely drought and flooding), and further impact on production of coffee, maize and other crops.
- The timely delivery of localized climate information has reduced crop loss and damage by 67% (\$226 - \$325 per household per year).
- Increased funding to improve farmers' access to adaptation information will significantly reduce crop loss and damage, and make communities more resilient to the impacts of climate variability and change.

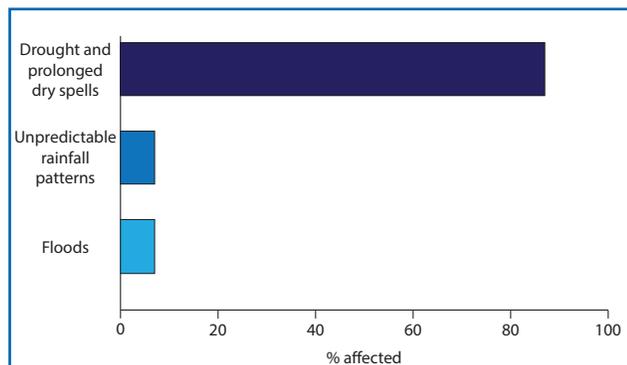
Soroti, Nakasongola and Sembabule, as well as the control district of Rakai. The project developed and deployed a climate information system comprising a set of ICT tools for the collection, analysis and dissemination of adaptation information. The system included mobile phone-based tools for gathering weekly

crop and livestock market information from 46 local market outlets, daily weather data from 22 sub-county weather stations in the intervention districts, and an information dissemination mechanism based on interactive radio, mobile phones and community meetings with local authorities. The households were linked to community support organizations that could provide resources to help convert information into action.

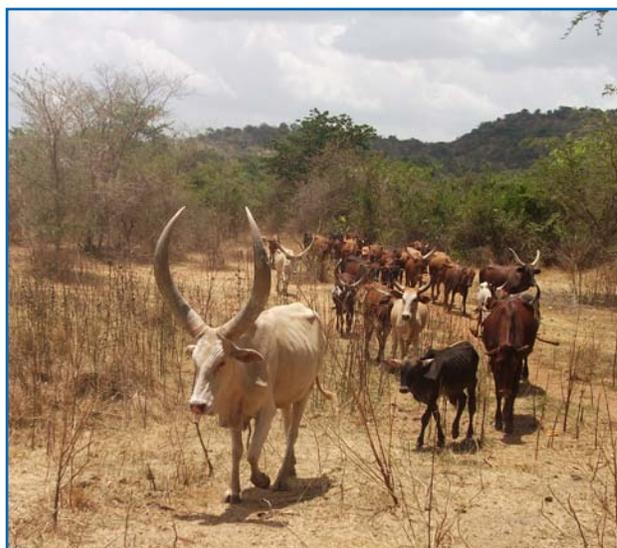
Mid-line and end-line surveys, involving 640 households in each survey, were conducted to assess changes in households' adaptive capacity over time. In addition, focus group discussions and in-depth interviews were conducted with community leaders and local community support organizations. Crop prices in local market outlets were used to calculate the monetary value of crop loss due to drought in the four districts. The Ministry of Water and Environment, Uganda Chartered HealthNet, FHI 360, Makerere University, district governments, and local radio stations were key collaborators in the project activities.

## What did we learn?

- The top three climate hazards experienced by respondents in the intervention and control districts were drought and prolonged dry spells (87%), unpredictable rainfall (7.3%), and floods (5.3%). About 78% of crop loss and damage was due to drought and prolonged dry spells.
- Information needs of communities include low cost rainwater harvesting techniques, localized climatic information, drought and



**Figure 1: Top three hazards in Nakasongola, Sembabule, Soroti and Rakai Districts**



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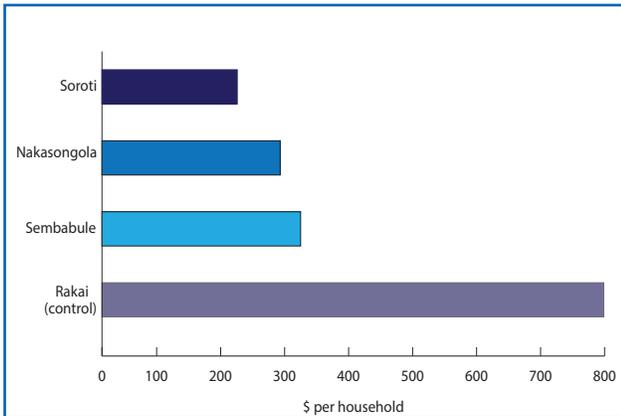
### Uganda's cattle corridor is prone to recurrent droughts

flood coping mechanisms, livestock and crop market information, termite control measures, and climate change awareness.

- The use of timely and locally relevant adaptation information reduced crop loss and damage by 67% (\$226 - \$325 per household per year) in the intervention districts compared to the control.
- Temperature and rainfall are projected to increase by between 1.4 - 4.2°C and 8.7 - 31%, respectively, by 2100. Crop modeling results show that crops like Robusta and Arabica coffee, rice and maize are likely to be adversely affected, while citrus fruits would do better with increased temperatures. Variability and increased intensity of rainfall is set to affect most crops adversely.

## Stories of change

Hellen Mary, a farmer in Soroti district, said "I have access to seasonal and 10 day weather forecasts, crop and livestock market information, advice on what crops to plant, and guidance on rainwater harvesting. With this, I am able to know which crops to plant at what time. This has helped me to minimize the loss and damage of my crops." Hellen notes that based on the lessons from CHAI, she built contours in her garden to maximize water infiltration, set up shade to block direct sunshine, and made informed decisions about what, where, and how much of her agricultural commodities to sell.



**Figure 2: Crop loss and damage in intervention and control districts (\$ per household)**

Limited availability of observational rainfall data and delays in submission for analysis were a major impediment to improving the accuracy of forecasts. However, the project enabled the Uganda National Meteorological Authority (UNMA) to produce timely seasonal forecasts localized to sub-county level. Previously, it took 1-2 weeks for 10 day forecasts to reach the farmers. With support from the project, these forecasts arrived the same day, sent to their mobile phones by text message. Around 100,000 farmers in the study districts were provided with seasonal and 10-day localized weather forecasts, weekly livestock and crop market information, guidance on low cost rainwater harvesting techniques, drought and flood coping mechanisms and agricultural advisories, and termite control measures, all in local languages. 75% of the households used the received information, and were able to reduce crop loss and damage by 67%.

To support the generation, dissemination and use of adaptation information, the project brought together national, district and village level institutions. This process was incorporated into the routine activities of participating institutions such as the UNMA, the Climate Change Department, and district government departments, which are responsible for crop production, water, agricultural advice, natural resource management, community development, commerce, and communications. Bringing the stakeholders together enabled the timely generation and dissemination of adaptation information to communities, providing households with the support they needed to apply their acquired knowledge.

## What are the policy implications?

A significant reduction in the loss and damage of crops was achieved as a result of improved access to locally relevant adaptation information, such as agricultural advisories, protection of plants from extreme heat, and guidance on low cost water harvesting structures. Linking communities to local institutions that are able to support them with resources, such as early maturing and drought resistant seeds, is critical if farmers are to be able to make decisions and take action based on the information they have received. Increased funding for the generation, dissemination, and use of relevant climate adaptation information across Uganda will improve agricultural productivity and food security for communities in the face of climate change.

The projected increases in temperature and variability in rainfall will negatively impact the production of food and cash crops, such as cassava, bananas, millet, maize, cotton and coffee. It is imperative that alternative livelihood options are considered, including intensifying the development of drought resistant seed varieties and promoting citrus trees, which are projected to be less affected by increasing temperature.



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**Sending rainfall data by mobile phone has improved the accuracy of forecasts**



A number of ICT tools were used to develop a climate information system

- It needs to be determined who should pay for the delivery of weather forecasts, agricultural advisories and other adaptation information. This will include assessing communities' and community support organizations' willingness to pay, and the role of the private sector in the dissemination of adaptation information.
- The longer term benefits of ICT-mediated adaptation in improving the adaptive capacity and resilience of the communities should be investigated.

## Need more information?

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## What next?

- To ensure that the climate adaptation information system developed by the project becomes sustainable and scalable, additional research into the technical, financial and institutional requirements is needed.

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