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## Forecasts for a Fairer Future

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## Information & communication technology

# Forecasts for a fairer future

**A system delivering weather details via short message service (SMS) to farmers in Kenya makes use of traditional and modern forecasting methods, alerting them to periods of heavy rain or drought. A report by Sharon Wanjiru Kamau**



The IGAD Climate Prediction and Applications Centre, a climate research institute representing seven east African countries, is working on a system using cell phones to help farmers address the negative impacts of climate change. They are initially working with farmers from the Nganyi community who are known for their own elaborate techniques for predicting the weather. Obedi Osore Nganyi, 74, a Nganyi rainmaker, shows the pot and other items used by the rainmakers in their rain forecasting activities.

*Credit: Flickr/Department For International Development / International Development Research Centre /Thomas Omondi*

Periodic floods and droughts have already had a major socio-economic impact in Kenya, and led to reduced economic growth in recent years. The extreme weather from 1998 to 2000 was estimated to have cost US\$ 2.8 billion from the loss of crops and livestock, forest fires, damage to fisheries, and reduction in hydropower generation, industrial production and water supply. Droughts in 2004, 2005 and 2009 affected millions of people and resulted in major economic costs from restrictions on water and energy, while the current drought in the Horn of Africa is said to be the worst in 60 years.

There are also health concerns as changing weather patterns cause the incidence of pests and diseases to rise in some areas. Recent studies, for example, show that people living in rural parts of Kisumu region will have a far greater risk of contracting malaria by 2050 than they have now. There is, therefore, a need for an effective early warning

system responsive to the needs of rural communities.

The IGAD Climate Prediction and Applications Centre (ICPAC), a climate research institute representing seven east African countries, is working on a system using cell phones to help farmers address the negative impacts of climate change. They are initially working with farmers from the Nganyi community around Kisumu as they had previously worked with ICPAC. The Nganyi are known for their own elaborate techniques for predicting the weather, based on knowledge and techniques passed on from generation to generation. The farmers have suffered in the last few years, as these traditional forecasting methods have proven less reliable in the face of increasingly erratic weather patterns.

There are still many other sources of climate and weather data, such as brochures, community meetings, radio and television programmes. However,

the community felt that the information often came too late to be useful, indicating that perhaps these more conventional modes of dissemination were not adequate. Also, many of the farmers were unfamiliar with the terms used in modern meteorological updates and were unable to interpret the technical language in a way that applied to their own lives.

### Perfect timing

Cell phones, however, have become invaluable for the Nganyi. Initial project research showed that 88 per cent of respondents in the community owned a cell phone, most of whom used it daily, while another 11 per cent had access to one through a family member or neighbour. A method of delivering information via cell phones could, therefore, be useful for reaching a large portion of the population.

The new system makes use of the Nganyi's traditional forecasting techniques combined with data from the Kenya Meteorological Department (KMD). The community's forecasters, known as rainmakers, meet with the members of the KMD every six months, before the onset of the twice-yearly periods of heavy rainfall, to discuss their respective findings. KMD staff compile the resulting information and enter it into a database. The information is then processed and packaged into a format suitable for sending as an SMS message, which is sent using an SMS gateway, a computer program for sending multiple SMSes from a single computer. This program broadcasts the messages through the cell phone network to the Nganyi farmers who have their numbers registered on the cell phone database. The information is delivered quickly, is relevant to the specific area and written in the local languages of Kiswahili and Luhya.

The messages contain details such as rainfall intensity and length of dry spells between rainfalls, if any are within the forecast range. This type of information helps farmers decide which crop to plant and when, and estimate the best time for weeding and harvesting. Extension officers visit the community to give practical advice, where necessary, on

the various tasks.

The system, therefore, gives the farmers an early warning, allowing them to prepare food reserves for the period during and after extreme weather conditions. This reduces their dependence on government resources for food and shelter when drought or floods affect the country. Timely weather information can also help the farmers manage their crops efficiently, which can lead to improved output and increased income.

The farmers have to pay to be part of the scheme, a cost that is prohibitive to

many, according to project research. The system currently delivers the information to just 40 farmers. The project will require external funding to reach more producers, at least for the first two years until it becomes financially self-sustaining.

An assessment of the project showed that there is a great demand among the farmers to break out of the cycle of poverty. They felt they could achieve this if they had increased access to competitive markets and more power to negotiate better prices for their produce.

The information from the ICPAC project could help the farmers realise this as it could improve the productivity and quality of their crops.

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Adegü David, of the Kenya Meteorological Department, shows the scientific processes of gathering and monitoring data at the meteorological weather station in Kisumu.

*Credit: Flickr/Department For International Development / International Development Research Centre /Thomas Omondi*