

Research Application Summary

New approaches for improving farmers' livelihoods through timely and proper use of weather forecast information: A pilot case in Kenya

Mwesigwa, J.B.¹, Onyango, M.², Oduor, J.³, Mwangi, S.⁴, Ayieko, J.⁵, Onyango, M.⁶,
Ogambi, F.⁷, Ole Ntiati, N.⁸ & Ogallo, L.A.¹

¹IGAD Climate Prediction and Applications Centre (ICPAC), P. O. Box 10304-00100, Nairobi Kenya

²Bondo University College, Centre for Gender Mainstreaming and Development,
P. O. Box 210 - 40601, Bondo - Kenya

³National Drought Management Authority (NDMA), P. O. Box 53547 - 00200, Nairobi Kenya

⁴Kenya Meteorological Department (KMD), P. O. Box 30259 - 00100, Nairobi, Kenya

⁵Nganyi Community, Kenya

⁶Nyahera Community, Kenya

⁷Reru Community, Kenya

⁸Loitokitok Community, Kenya

Corresponding author: jbmwesigwa@icpac.net

Abstract

Preliminary observations from community-based agricultural projects have revealed that proper and timely use of weather forecast information can significantly improve farmers' yields within communities that are vulnerable to extreme conditions of weather, climate change and variability. By increasing their agricultural productivity, food production and food security the community livelihoods are enhanced. ICPAC is strategically placed in a strong partnership with Kenya Meteorological Department (KMD) to forecast, innovatively package and disseminate the forecasts to user communities as early warning for related agro-meteorological activities. The participating farming communities rely on the information disseminated through established ICPAC networks. In addition, there is extensive stakeholder involvement during participatory community capacity building workshops which involve grass root farmers and community leaders. This is reinforced through successive regular dissemination of (down-scaled 10-day, monthly and seasonal weather forecast) updates. This has a great potential in strengthening the resilience of the community to adapt and cope with the current and future unfavourable climatic conditions and related hazards for their improved well being.

Key words: agricultural productivity, climate change, climate variability, community resilience, improved livelihoods, weather prediction and dissemination

Résumé

Observations préliminaires de projets communautaires agricoles ont révélé que l'utilisation appropriée et en temps opportun des prévisions météorologiques peuvent améliorer considérablement les rendements des agriculteurs au sein des communautés qui sont vulnérables à des conditions extrêmes de la météo, le changement climatique et la variabilité. En augmentant leur productivité agricole, la production alimentaire et la sécurité alimentaire des moyens de subsistance de la communauté sont renforcées. ICPAC est stratégiquement placé dans un partenariat solide avec Kenya Meteorological Department (KMD) de prévoir, de manière innovante et de diffuser les prévisions pour les communautés d'utilisateurs que l'alerte précoce pour les agro-météorologiques liées à des activités. Les communautés agricoles participantes comptent sur l'information diffusée par le biais des réseaux établis ICPAC. En outre, il y a une vaste participation des parties prenantes lors d'ateliers communautaires participatives de renforcement des capacités qui impliquent les agriculteurs racines de graminées et les dirigeants communautaires. Cette impression est renforcée par la diffusion régulière successive de (bas-échelle prévisions météo à 10 jours, mensuelles et saisonnières) mises à jour. Cela a un grand potentiel pour sans aucun doute de renforcer la résilience de la communauté à s'adapter et à faire face aux actuels et futurs des conditions climatiques défavorables et les risques connexes pour leur bien-être amélioré.

Mots clés: prévision météo et de la diffusion, la productivité agricole; la résilience communautaire; Amélioration

Background

It is well understood that climate is an important resource in determining the productivity and sustainability of agricultural production. The major challenges, however, are the low uptake and use of climate information by the end users in the agricultural sector due to lack of user-friendly climate products tailored to the agriculture sector, limited access to climate information, lack of understanding of the dissemination language often used (inappropriate information packaging), and lack of location-specific forecast information in the context for meaningful agricultural applications. This project's overall objective is to strengthen the capacity of ICPAC to provide down-scaled demand-driven climate information to agriculture and food security sectors for increased resilience in these sectors and reduced vulnerability to the risks associated with climate variability and change in the Greater Horn of Africa (GHA) region. The project is being piloted within 4 communities in

Literature Summary

Kenya, i.e., Loitokitok (predominantly pastoral rangelands in the Massai land which is highly vulnerable to severe and frequent droughts), Reru (characterized by semi-arid conditions comprising of highly religious subsistence farmers), Nyahera (characterized by subsistence peri-urban agriculture and currently being affected by urbanization) and the Nganyi (with a long history of traditional weather forecasting and commonly considered to be rain makers). Over 120 crop farmers and pastoralists are currently participating in this project.

Agriculture is recognized as the most sensitive sector to variability in weather and climate (WMO, 2004). In Africa, the Greater Horn of Africa (GHA) is highly vulnerable to climate extremes (especially floods and droughts) (Niemi and Manyindo, 2010). Over 80% of the GHA experience Arid and/or Semi Arid conditions. The region suffers from high risks of food shortages every year owing to harsh climatic conditions, which at times leads to extreme conditions of hunger, famine and food insecurity. These result into destitution, migrations and at times death of the people. Adapting agricultural systems to climate risks including climate change can be enhanced through thorough understanding of the past and present climatic patterns and the associated impacts and vulnerabilities; effective monitoring systems; and prediction and timely dissemination of early warning, increased awareness on the usefulness of climate information and prediction products in decision making as well as mainstreaming climate risk management strategies in planning and decision making.

Through regional climate outlook forums (RCOFs), the IGAD Climate Prediction and Application Centre (ICPAC) in collaboration with World Meteorological Organization (WMO), regional National Meteorological and Hydrological Services (NMHSs) and other international organizations provide consensus-based early warning seasonal climate information for reducing climate-related risks and to support sustainable development efforts of some specific regions (www.icpac.net). However, there is low uptake and use of such climate information by the end users in the agricultural sector due to lack of user-friendly climate products that are tailored for the agriculture sector, limited access of climate information, lack of understanding of the dissemination language often used (inappropriate information packaging), and lack of location-specific forecast information contexts for meaningful agricultural applications.

Study Description

The current project aims at strengthening the capacity of ICPAC and that of vulnerable communities in climate risk reduction. The goal is to improve agricultural production and food security through development and dissemination of tailor-made agrometeorological products and services for sustainable development of the IGAD region.

Briefly, meteorologists at ICPAC and Kenya Meteorological Department (KMD) provide location-specific seasonal, monthly and decadal weather forecasts which are then interpreted and repackaged by the Agrometeorologist into user-friendly information products and related agricultural advisories for crop farmers and pastoralists; the information products are then disseminated through various channels, such as: seasonal climate outlook workshops, field days, SMS Messages, Church, and other forms of media yet to be used (brochures, posters, radio, TV, etc).

The disseminated information products guide farmers in making timely and informed decisions about the type of farming technologies to employ for increased food production and food security (e.g. when to plant, the type of seed to use, where to plant, what management practices to consider, etc). At the end of every season, an evaluation is carried out to quantify and document the achievements made out of the implemented interventions. The difference arising from the interventions (output and outcome results) are used in informing policy makers for revising current policies or formulating new ones that recognize the use of climate/weather information for improved food production, food security and livelihoods in the vulnerable farming and pastoral communities in the entire IGAD region.

Research Application

The three-year project which started in January 2012 has so far progressed very well. It is targeting increased production of six food security crops (maize, beans, sorghum, green gram, sweet potatoes and cassava) in the rain fed agricultural systems of Western Kenya, pastoral and small scale irrigation schemes in the Maasai land. It has already demonstrated that proper and timely use of weather forecast information can significantly improve farmers' livelihoods within communities that are vulnerable to extreme conditions of weather brought about by climate change and variability. This has been achieved through farmers adopting improved production technologies based on the forecasted weather. For example, the subsistence crop farmers have adopted timely planting, proper land use planning,

use of the right varieties, proper crop management (timely weeding, fertilizer application, crop protection), earthing up during periods of depressed rains among others based on the forecasted weather. The small scale irrigators have adopted timely planting (including dry planting) and growing of short season crops.

On the other hand, the pastoralists have embarked on reseeded of the degraded pasture lands, preservation of portions of grazing lands during the rainy season for use after cessation, diversified production (including small scale irrigation, apiculture and making crafts) and regular culling of their livestock. Both crop farmers and pastoralists have benefited through improved product diversification as a form of adaptation, increased capacity in proper use of weather information, increased crop and livestock production, increased resilience to climate variability and change and increased food security and livelihoods in all pilot communities.



Figure 1. A: A perfect contrast between project demonstration (Left) and a garden belonging to non participant farmer (Right) in the peri-urban community of Nyahera; B: Maasai women standing in a portion of preserved pasture; C: Vigorous Maize/Green gram intercrop demonstration in Reru community and; D: A portion of highly overgrazed/degraded pasture land in Loitokitok, Maasai land.

Acknowledgement

We acknowledge The Rockefeller Foundation for funding the project. Several other institutions contributed in various ways: Kenya Meteorological Department, National Drought Monitoring Authority, Kenya, Bondo University College, Kisumu, University of Nairobi, Kenya Red Cross Society, Kenya Polytechnic University. We acknowledge their support. The Communities of Reru, Nyahera, Nganyi and Loitokitok are hosting the project activities.

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