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Community-based climate monitoring services and early warning system: The Case of the Nganyi Community

The problem

Recent Intergovernmental Panel on Climate Change (IPCC) reports [1] indicate that disasters associated with current climate extremes are impacting negatively on livelihoods and socio-economic systems. Extreme weather events such as floods and droughts are negatively impacting on agricultural production and other socio-economic sectors in the Greater Horn of Africa (GHA) region [2]. It is expected that climate change will increase the severity and frequency of these extreme weather events with adverse effects particularly on vulnerable and poor communities.

Figure1: Impacts of climate extremes associated with floods (L) and drought (R) in parts of GHA (Source: ICPAC)

Although there has been significant improvement in the science and technology related to climate, most of the early warning strategies piloted in African countries are developed and applied without inputs from the vulnerable local communities, including their local knowledge, needs, and priorities. This often leads to non-use of the available early warning products.

The science

In Africa local and indigenous knowledge has been used for survival, including forecasting of local hazards by local communities for many generations. The knowledge is passed orally from one generation to another [3, 4, 5]. The community-based forecasts are founded on local indicators derived from behaviour of animals, plants, atmospheric conditions, astronomic features, among others [6]. The Nganyi are a community in Western Kenya who, for over 100 years, have been involved in providing local weather advisories based on their local and indigenous knowledge, but remain significantly vulnerable to climate related hazards. There is evidence that local/indigenous knowledge and modern climate science information can provide important climate risk reduction information tools [4], but challenges remain due to differences in approach and lack of universal benchmarks for comparison or validated frameworks for their integration [5, 8, 9].

The application to policy and practice

In view of these issues, a pilot project was established by IGAD Climate Prediction and Applications Centre (ICPAC), Kenya Meteorological Department and other relevant local institutions in collaboration with the local Nganyi Community. The pilot attempted to integrate, at community level, climate information generated from WMO Global Climate Centres, ICPAC and Kenya Meteorological Service (KMS) with local climate knowledge from the local community (Figure 2) [4, 5, 7]. The pilot study has been running since 2008, with community-based pre-season planning and post season evaluation forums held every six months. Before the beginning of each rainfall season (March to May and September to December) the two systems develop their forecasts in parallel and are merged through a consensus meeting between the modern-day climate scientists from KMS on one hand and the Nganyi Indigenous Knowledge (IK) forecasters on the other through the facilitation of experts from a local university.

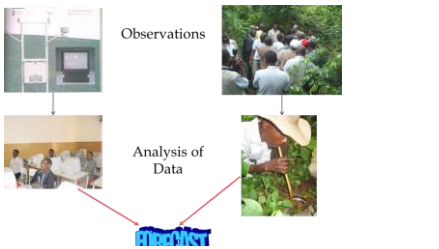

Figure 2: Community based and modern day climate Information

The pilot study includes local level administrators and sector-specific experts from ministries of agriculture, water, environment, social services and health to facilitate the development of the local mitigation strategies. The local experts also became "connectors/conduits" for the dissemination of the weather/climate information, with recommendations translated into the local language. Sector specific demonstration forums were also organized where each of the "connectors" could discuss sector-specific climate recommendations needs, priority and challenges. The pilot study observed that even though there was diversity within the climate outlook information developed by the Kenya Meteorological Services (KMS), these outlooks were not readily acceptable to the local community. However, the use of the climate early warning information increased substantially when local climate information and the community risk management knowledge were included in the final community climate risk management recommendations.

Factor /issues	Modern-day Science	Indigenous Knowledge
How approached (Brascoupé and Mann, 2001)	Compartmental	Holistic
How communicated (Brascoupé and Mann, 2001)	Written	Oral
How taught (Brascoupé and Mann, 2001)	Lectures, theories	Attachment of selected few youth to under study elders
How explained (Brascoupé and Mann, 2001)	Theory, "value free"	Spiritual, social values
Data/information collection methods	Observatories including space based technologies, and computer models simulations	Indicators from shrines, institutional memory of elders
Skill assessment	Basic statistical tools	Results based on impacts on the community systems
Knowledge sharing	Free sharing of data and basic knowledge with UN/WMO proving baseline standards and guidelines	Knowledge restricted to few IK experts and only final early warning products are shared
Preservation / storage of information and Documents	Journals, books, computer files, etc.	Oral memories by the elders and environment resources stored in the shrines
Experts	Well educated researchers	Most of the IK experts have no formal education
Local area representation of forecasts	Often represents very large area due to poor observational network at most local levels	Data from the Shrines provide area specific data and information that has many advantages
Patent of knowledge	System are available for patenting new climate science innovations and discoveries	No system available in Kenya in 2012 for patenting IK

Table 1: Differences between modern-day climate science and Indigenous Knowledge based system

Did it make a difference?

Previous seasons' forecast skills were evaluated at the end of each season by various groups, including a team of experts from a local university. The results were very encouraging (Text Box 1). A committee made up of the local government officials, the local member of parliament, the local community leaders, KMS and local experts has been set up to sustain the intervention beyond the project-life. A local resource centre was built through the project with the support of the local community and KMS to be the hub of the local disaster risk reduction communication system.

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The Community Centre is equipped with modern meteorological observation instruments and a local FM radio communication system. The local community youth have been trained not only to run the meteorological observation station and the FM radio station, but also in basic disaster management and climate change adaptation for the sustainability of this unique pilot community project.

Text Box 1: A quotation from Mrs Odeny, a member of the Nganyi Community
"For the first time since I got married in Bunyore, I managed to harvest a whole bag of millet and five bags of maize from my small piece of land which in the past gave me less than a bag of maize every season."

This case study showed that local and indigenous knowledge of a community can be used to improve a climate early warning system for enhanced resilience to local disasters and climate change adaptation by increasing the uptake of its recommendations at a local level through greater community engagement in generating the forecasts [6]. Local/indigenous knowledge of a community can be used not only to improve trust, confidence and ownership by the local community, but also help to integrate community-based climate monitoring services and early warning knowledge in support of local disaster risk reduction and climate change adaptation.

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