Keynote Speech

Roles of local and indigenous knowledge in addressing climate change

Dr. Henry Mahoo, Sokoine University

Keynote respondant: Evans Kituyi (IDRC)

Perspectives from community representatives:

Mohammed Alyi Ahmed and Abdela Alyi Mohammed

Session summary

Dr. Mahoo provided an overview of the use of indigenous and scientific approaches to climate forecasting, the challenges in the current uses of each, and how the two could be linked. Key points highlighted included the localised and fragile nature of indigenous knowledge and the challenges of appropriate scales and formats of scientific forecasts. He then outlined research on linking indigenous and scientific forecasting that is being conducted by Sokoine University and the Tanzanian Meterological Authority. This project brought together a wide range of stakeholders to coordinate efforts in getting appropriate climate information and advice to Tanzanian farmers. Conclusions from this research highlighted the value of scientific forecasting in helping famers prepare for the *quantity* of rainfall to expect while indigenous knowledge can help predict onset periods rainfall at field level and called for more downscaling of national seasonal forecasts, systematic documentation of indigenous knowledge, and the production of consensus forecasts using scientific and indigenous knowledge at field scale.

In his keynote response Dr. Evans Kituyi stressed the importance of integrating reliable and well-developed climate information into development planning. He called for more examples from the ground to help inform decision making. He noted that farmers will continue to use IK to make decisions and stressed the need for the scientific community to take on board the knowledge that is being generated at this scale. He noted other examples of how this work is being taken up by national governments, such as in Kenya. He called for more systematic analysis and observation of IK cases so that they can learn more and integrate more from their practices and increase the confidence of scientists. Thus there is a need for further funding to make this happen more broadly. He noted the need for better institutional collaboration.

That Q&A discussion that followed raised a range of comments, issues and concerns. These included, inter alia:

- The reliability of IK compared to scientific climate forecasts
- The need for documenting IK practices, and demystifiying these practices
- Current threats to IK practice, including the possible loss of IK due to CC, and the importance of intellectual property rights in using IK
- The perspectives of community on interacting with IK, and the differences between local, traditional and indigenous knowledge
- How indigenous farming practices can also help mitigation

The panel also featured two interventions from Ethiopian farmers who are using irrigation to address the impacts of climate change that they are experiencing. The farmers described using local tools and know-how to dig deep springs and provide irrigation for agriculture.

Henry Mahoo – Keynote Address

The roles of indigenous knowledge weather forecasting in addressing climate change

Prof. Henry Mahoo (Sokoine University of Agriculture, Tanzania)

In many communities the world over, indigenous knowledge (IK) in weather forecasting has been used as the basis for local-level decision-making. It has value not only for the culture in which it evolves, but also for scientists and planners striving to improve conditions in rural localities. Local communities and farmers have developed intricate systems of gathering, predicting, interpreting and decision-making in relation to weather. Examples from Kenya include the Nganyi clan whereby elders base their seasonal predictions on close observation and understanding of weather patterns, and the behaviour of plants and animals before the onset of rain. Similarly, local communities in different parts of southern Tanzania have been coping and adapting to increased climate using IK in weather and climate prediction. Prediction of impending disasters has been an integral part of their adaptation strategies.

In spite of all these benefits, IK is faced with several challenges. They include among others:
Lack of proper documentation, as the old pass away, IK knowledge which has been accumulated for many years is lost. In IK, the old pass their accumulated knowledge orally from one generation to the next. The other challenge is lack of coordinated research to investigate the accuracy and reliability of IK forecasting. IK weather forecasting is also constrained by the fact that it applies over a small area (local specific) and can not be extrapolated to other areas. It is for this reason that scientific weather forecasting is used.

The application of science and technology to predict the state of the atmosphere both temporally and spatially is termed scientific weather forecasting (SF). Currently, weather forecasts are made by collecting quantitative data about the current state of the atmosphere and using scientific understanding of atmospheric processes to project how the atmosphere will evolve. Massive computational power is required to solve the equations that describe the atmosphere and incomplete understanding of atmospheric processes mean that forecasts become less accurate as the range of the forecast increases. This is one of the limitations of SF. Unfortunately, the information generated is the one provided by national Meteorological Department/Agency of most countries. At field scale level the information is not applicable and most stakeholders including farmers can not use the information to assist in decision making.

To address the shortfalls in IK and SF, a case study was undertaken under the project ‘Managing risk, reducing vulnerability of and enhancing agricultural productivity under a

changing climate' funded by IDRC/DFID. The major aim was to come up with a structure that can make the 'best' of the two sciences for the benefits of farmers in rural Same District in northern Tanzania. Discussion with key stakeholders led to the formation of a Core Team of experts representing IK forecasters, SF forecasters, NGO, District Agricultural extension staff, Inputs suppliers and University researchers. Among the functions of the core team is to make a consensus forecasting whereby they combine IK and SF weather forecasts before the start of the rainy season. The resulting forecast is packaged and disseminated immediately to all stakeholders and communities. This final stage in the consensus forecasting process is perhaps the most important. Knowledge of what the end user needs from a weather forecast must be taken into account and present the information in a useful and understandable way.

Evans Kituyi – Keynote response

A significant number of communities across Africa rely on local and indigenous knowledge to inform their farming decisions, and will, in the absence of meaningful intervention, continue to do so in the foreseeable future. There is a need for the scientific community to take on board the knowledge that is being generated at this scale, but the tools and mechanisms for mobilising this knowledge are inaccessible. To effectively harness this knowledge from the communities, we must first understand the decision-making structures of the farmers.

We must start from a development angle to succeed. As we have already heard, good development will lead to adaptation, and a deliberate strategy is needed to integrate reliable and well-developed climate information into development strategies. We need to learn more from the lessons coming from practical actions on the ground, and use these to design and scale-up strategies, and distil policy messages so that they effectively inform decision-making.

There are a number of strengths in IK forecasting from which we should look to borrow from and build on. Foremost amongst these are: reliability at the local scales; trusted, well-tested communication strategies; and the ability to determine the onset of rains. We should aim to utilise a combination of IK and scientific forecast options. Government support will be required to make this happen, and recent integration efforts through CCAA-funded projects in Kenya and Tanzania have reported great success in this regard.

Increased observation and analysis of IK is needed to improve the data validation of IK methods. Through a better understanding of IK, scientists should increase their confidence in it, encouraging them to change their attitudes to it. Similarly, donor courage to further support IK is needed. DFID/IDRC have supported projects through CCAA, and other organisations and governments need to be encouraged to provide climate financing in this area, and to provide better institutional collaboration.

Mohammed Alyi Ahmed and Abdela Alyi Mohammed – Perspective from community representatives

Mohammed and Abdela are farmers from a rural community in Ethiopia. In recent years, drought has become a huge problem. The increasingly erratic nature of the rains makes conditions even worse. They have not been provided with any government support, so have had to look to themselves and others within their community to provide solutions to the water scarcity problems. Without any machinery or proper materials, they have used their own know-how and local materials such as wood and stone to create an irrigation system.

It took them six months of working day and night, and mobilising everyone from within the community to share the labour. But now they have successfully dug deep springs and irrigation channels from a nearby river to their community. Although there are still ongoing concerns of droughts and floods, this has provided a much more secure water supply and makes their farming much more resilient to future droughts.

They even have the potential to produce excess crops when the rains are good, some of which they can sell at markets, raising valuable money for the community and helping to feed more people in nearby communities. But the story doesn't end there: the infrastructure in their region is very sub-standard and they still urgently need support from the government to build roads and improve their access to markets.