Data synthesis and integration for improved climate impact assessment, modelling and policy

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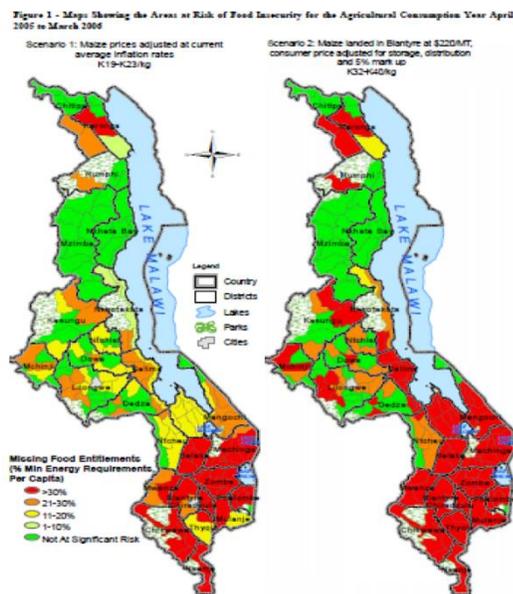
Figure 1: Maps showing the predicted food deficit following a severe crop failure in 2005. Two model scenarios based on different projected maize prices. *Source: Malawi VAC*

Climate change is already demonstrated in changes in the frequency and severity of extreme weather events. The UK government is providing £3.87 billion through the International Climate Fund to help developing countries mitigate and adapt to climate change and within the UK aid programme, £110 million has been allocated to projects that aim to build local resilience.

Research into the impacts of climate change on human populations is producing valuable hydro-meteorological, crop yield, health and livelihoods data and models. However, whilst a key policy objective of research to date has been to enhance the capacity of developing countries to adapt to climate change, much of that work remains siloed or one dimensional and is not easily translated into

knowledge and evidence that can be used by decision makers across all governance levels. What is needed is a platform to integrate this data, together with tools and analytics that will enable policy makers in government and other agencies to make better and more timely decisions to prepare for and adapt to likely impact of shocks and long-term trends on local economies, and on the livelihoods of vulnerable people, their health and well-being.

One of the keys to success for policy makers attempting to deal with climate change in developing economies is understanding the resilience of populations – the nature of their vulnerabilities and their ability to withstand shocks, for example to flooding, or to crop failure, and the impact on the nutritional status of impoverished rural communities.

The objective of this project is to integrate analysis of shock impacts across sectors (agriculture and health) and population dynamics, recognizing that complex feedback systems are also highly context dependent and include social, political/institutional and economic factors.

This research will explore, integrate and publish available data sets including climate, crops, health and livelihoods information. It will exploit data mining and other statistical approaches to develop techniques and algorithms with the objective of identifying the greatest vulnerabilities within and across defined populations. Exemplars will be taken from several DAC-listed countries in Africa where the Walker Institute and the Centre for Agri-Environmental Research, School of Agriculture, National Centre for Earth Observation and Evidence for Development (EfD) are already working together in partnership with national government, academic and NGO stakeholders.

Specific innovations include:

- Enhanced understanding of extreme events and their specific characteristics that impact on impoverished rural communities, and their health and well-being, with links to weather regimes in DAC-listed countries in Africa;
- Through the placement with EfD, use of this new integrated scientific understanding to build an evidence-based response to emergencies for improving disaster preparedness, in line with international standards (e.g. Sendai Monitor) and local expectations;
- New inter-supply chain multidisciplinary thinking, technological development and action which will be an essential element towards achieving sustainable food and nutritional security.

Training opportunities:

Bespoke training will be provided to the student according to need – for example, in measuring and modeling livelihoods, in crop modelling and in international development policy-making processes and practices. As part of a 3-month internship with the NGO, Evidence for Development, the student will receive individualized training in household economy measurement and modelling followed by field work collecting livelihoods data in Uganda, where they will work with highly experienced EfD associates, and with Walker Institute/EfD partners in the University of Gulu, Northern Uganda. Successful completion of this study will lead to certification in household economy theory and practice, which is recognized by both NGOs and donor organisations. Through the **Walker Academy**, there will be opportunities to be part of the COP-Climate Action Studio (COP-CAS) hosted during the international COP meetings as well as Knowledge Synthesis training (CSAT). The successful student will also have access to safety and security training (SAFE) in preparation for work in developing countries.

Through the Walker Institute's wider programme of research, there will also be opportunities for networking with donors and researchers working in climate science and its application to international development, as well as participating in on-going research with the African Union, national governments, the World Bank, UN agencies and other leading UK, US and African universities.

Student profile:

Applicants should hold a minimum of a UK honours degree at 2.1 level, or equivalent, in a relevant discipline such as meteorology , physics, mathematics, geography or environmental science. A strong background in numerical/statistical techniques and the application of those techniques in big data and database programming is essential. Knowledge of data modelling and data integration would be advantageous. Prepared to travel in developing countries.

Funding particulars:
A CASE award of an additional £1000 pa over 3 years will be made available, and the student will be able to benefit from a 3 month placement within the co-sponsoring NGO organization, EfD. There will be option to repeat this placement.

See Also:
http://www.walker.ac.uk/projects/hycristal-integrating-hydro-climate-science-into-policy-decisions-for-climate-resilient-infrastructure-and-livelihoods-in-east-africa/

Seaman, J. A., G. E. Sawdon, J. Acidri, and C. Petty, 2014: Climate Risk Management. Climate Risk Management, 4-5, 59–68, doi:10.1016/j.crm.2014.10.001.

 "Malawi's 2007 Bumper Harvest: Is Everyone Food Secure? Malawi Vulnerability Assessment Committee, June 2007. "http://www.wfp.org/content/malawi-bumper-harvest-everyone-food-secure-june-2007