Climate Change in Africa: Linking Science and Policy for Adaptation

Workshop Report

The Royal Society, London, March 30th 2006

Authors:
Esteve Corbera[1,2], Declan Conway[1,2], Marisa Goulden[1,2] and Katharine Vincent[1]
[1]Tyndall Centre for Climate Change Research
[2] School of Development Studies & Overseas Development Group
University of East Anglia

Tyndall Centre for Climate Change Research

iied International Institute for Environment and Development

Executive Summary

The Tyndall Centre jointly with the International Institute for Environment and Development organised a one day workshop entitled **Climate Change in Africa: Linking Science and Policy for Adaptation**, held in the Royal Society, London, on the 30th of March 2006. The workshop brought together over 70 participants across the UK government, international NGOs and research communities to: review the state of knowledge on Africa and climate change; to identify capacity constraints in African research networks limiting their effectiveness in both research and influencing climate adaptation policies; to use examples of existing research and development programmes aimed at reducing vulnerability to current climate variability (and other stressors); and to draw out the lessons for policy-makers involved in developing programmes on climate change in Africa. Below we provide a synthesis of the key messages related to these objectives.

Questions identified for future research

- There is a need to refine study of climate change modelling and scenarios on shorter timescales (5-20 years) than is often presented in climate change studies in order to be consistent with development priorities and investments (e.g., MDGs).
- Identify/analyse ways to improve collaboration between climate scientists and data users, in particular to target scientific outputs to the needs of resource managers.
- Expand research efforts to understand the context-specific nature of vulnerability and adaptation, working closely with local, regional and national governments in order to identify policy interventions which reduce vulnerability and enhance adaptation.

Capacity constraints

- There is still a lack of individual/institutional capacity in African countries to conduct climate change research.
- There is a need to better integrate climate-related information to sectoral policy-making in African countries, although National Communications and National Adaptation Plans (NAPAs) may be suitable avenues to foster such integration
- Internationally, there is a need to further strengthen (and secure funding) for existing research networks, as well as extend their programmes of research. New research programmes in this direction (e.g., the IDRC-DFID CCAA) are welcomed.
- There is also a need to improve collaboration among scientists and governments to share climatic data. Closely related to this is the need to improve the number of monitoring stations and the capacity to manage and analyse data that are collected.
- Identify institutional mechanisms through which the natural disaster and climate change communities can be closely linked in terms of research effort and funding strategies.

- It is important to look at capacity-building not as the provision of short workshops but as a sustained process involving both African researchers and policy-makers, and conducting activities within African countries.

Suggestions for policy-makers (at national and international levels)

- Equal partnerships between Northern-based and African institutions, as well as African leadership, in networks and research programmes should be promoted.
- Governance, in the form of institutional capacity, is a key issue and efforts are needed to build more robust functioning institutions.
- There is a need to embed adaptation in existing planning systems.
- Reliance on rain-fed agriculture makes people particularly vulnerable to climate impacts. Augmenting human capital through education and health care should be recognised as a critical process for enhancing resilience and adaptive capacity.
- Adaptation is undertaken by individuals and institutions across different scales and it should be seen as a process to be supported rather than an outside intervention that promotes standard or blueprint actions.
- Policy-makers' responsibilities should include consideration of a wide range of stakeholders in cross-sectoral policy planning.
- Promote risk-management strategies, including livelihood diversification and compensation measures or safety nets for the most vulnerable.
- Promote disaster risk reduction strategies, which can be synergistic to other adaptation efforts.
- It is important to factor climate change into new development investments and ensure the effective development and implementation of National Communications, NAPAs, and promote cross-sectoral policy dialogue.

1. Rationale and objectives[1]

The "Climate Change in Africa: Linking Science and Policy for Adaptation" workshop was held at the Royal Society, London, on the 30th of March 2006. It was funded by the Tyndall Centre for Climate Change Research and convened by the Tyndall Centre and the International Institute for Environment and Development. More than 70 participants from policy, research and NGO communities attended the workshop.

The meeting aimed to raise awareness across different communities and to refine knowledge for policy applications in relation to four key objectives:

1. To review the state of knowledge on Africa and climate change and highlight important questions for research;
2. To identify capacity constraints in African research networks that might limit their effectiveness in both research and influencing climate adaptation policies;
3. To use examples of existing research and development programmes aimed at reducing vulnerability to current climate variability (and other stressors) that are also likely to be identified as key adaptation measures for future climate change;
4. And to draw out the lessons for policy-makers involved in developing programmes on climate change in Africa.

The morning session was structured around six keynote speaker presentations and two panel discussions, while the afternoon session consisted of break-out groups organised around four thematic areas. Details of these sessions and a synthesis of the workshop key messages are outlined below.

2. Climate Change in Africa

Stephen Connor (IRI, Columbia University) argued that the greatest burden of morbidity and mortality in sub-Saharan Africa (SSA) results from a combination of infectious disease and malnutrition and that Africa's development prospects are constrained as a consequence. Both of these factors are climate sensitive. Therefore, he advocated an integrated approach to climate risk management in sensitive sectors. An example of its application, incorporating vulnerability assessment, climate forecasting, environmental monitoring, health surveillance, and pro-active response planning for routine epidemic malaria control in Southern Africa was presented. The potential for its application elsewhere and its role in improving resilience to future climate variability was discussed.

Anthony Nyong (University of Jos) outlined Africa's key vulnerabilities to climate change, including a review of the major impacts on key sectors - water, energy, health, agriculture, biodiversity and livelihoods. This was followed by an outline of the role of adaptation in reducing these impacts, and examples of distinct future adaptation options and the likely obstacles for their effective implementation. Finally, **Roland Schulze** (University of KwaZulu Natal) summarised a recently completed

[1] Further details, including keynote speakers presentations, can be found in the Tyndall Centre website: www.tyndall.ac.uk/events/past_events/past_events.shtml

study on the potential impacts of climate change on the water sector in South Africa. The study identified a number of critical river catchments and was accompanied by an adaptation framework with respect to policy/legislation, administration/institutional and research/monitoring.

The first panel discussion was introduced by **Mike Hulme** (Tyndall Centre) who raised the question of how one should evaluate and prioritise among three types of climate information (namely, investment into climate observation networks, improvement in the quality of seasonal forecasting, and improvement of the robustness of long term climate scenarios), and whether it is possible to estimate which of these investments would be more valuable for enhancing present and future human welfare. Hulme also noted the differences in terms of confidence in seasonal forecasting and the robustness of climate scenarios between the UK and Africa (i.e., while seasonal forecasts have better potential for Africa than Europe, the robustness of future climate scenarios, particularly for rainfall, is greater in Northern Europe than Africa).

Fatima Denton (UNEP RISOE), the second panel discussant, focused on issues of governance and knowledge management. She emphasised that, in the water sector, a number of problems are old problems that may be exacerbated by climate change. Thus, governance, in the form of institutional capacity, is a key issue and efforts are needed to tackle water management problems by building more robust functioning institutions. She stressed the importance of building linkages between scientists, policy makers and resource users, particularly local communities who are often not consulted in policy decisions when vulnerability reduction strategies are thought through. She also mentioned the need for countries in Africa to work closely to identify joint strategies for adaptation especially in the absence of economies of scale and given similar economic indicators and shared geographical attributes. She stated that this was essential, especially in countries where human and financial resources are limited. It would make sense for countries to identify joint adaptation strategies and policies (for instance in river basin adaptation where there are shared watercourses and a high degree of water dependency as among West African countries). This would also help in building institutional capacity and allow the pooling of information. This is important as information is often dispersed between different centres and lost at the end of specific projects. She said that information is available but it is not always reliable or credible.

Keynote speakers noted that Africa has poorly funded research and government institutions, which makes it difficult to build and retain capacity for climate modelling and adaptation. Regional centres of excellence should be created and expertise within research and government institutions needs to be strengthened beyond a few individuals to form effective teams. For this to happen, however, a stronger effort in coordinating funding streams, both national and international, needs to be realised. Both the audience and keynote speakers voiced their concerns regarding the availability of climate data across Africa and the lack of cooperation in sharing such data across governments and research centres. They noted that investment in climate monitoring systems has been diminishing in many countries despite the importance of such data for climate observation and forecasting. Some keynote speakers finally emphasised the importance of looking at capacity-building not as the provision of short workshops but as a sustained process involving both African researchers and policy-makers, and conducting activities within African countries.

3. African Science and Research Networks

Daniel Olago (University of Nairobi) presented START's (Global Change System for Analysis, Research and Training) efforts in the African region. START focuses on developing collaborative regional networks comprising individual scientists and institutions, working on a set of common regional challenges pertinent to global environmental change issues. He noted a number of activities promoted across the continent, including the enhancement of the science-policy linkages for global environmental change and the building-up of human resources and institutional development through training, research activities and fellowships in support of policy/decision-making.

Thomas Downing (Stockholm Environment Institute) argued that adaptation spans many different types: from contextual and local to systemic and global; with immediate costs and delayed benefits, no benefits or costs that exceed benefits; from urgent needs weakly related to climate change to urgent and effective measures that anticipate climate change. Most importantly, adaptation was presented as a process of choosing risk management strategies at appropriate scales. In the context of National Adaptation Plans of Action (NAPAs), he presented a number of information systems and decision tools for linking climate risks to adaptation decision making.

Finally, **Neil Leary** (START Secretariat) presented the outputs of the Assessments of Impacts and Adaptations to Climate Change (AIACC) Programme, funded by START. He outlined the programme's objectives and activities and he highlighted key lessons from the programme's projects. These related to: the temporal scale of adaptation; the policy and research actions required at distinct spatial scales to induce more effective adaptation; the existing challenges in capacity-building and stakeholder involvement processes; and the importance of building south-south networks.

The second panel discussion was introduced by **Victor Orindi** (African Centre for Technology Studies) who noted the existence of other networks, in particular the Capacity Strengthening in the Least Developed Countries for Adaptation to Climate Change (CLACC) working in nine LDCs in Africa through action research and awareness raising; and the Climate Outlook Forum (COF) organised by the IGAD Climate Prediction and Application Centre (ICPAC) based in Nairobi, and the Drought Monitoring Centre in Harare. All these networks allow African researchers to get together and share knowledge and experiences with users of climate information, policy makers and vulnerable communities. In turn, **Rob Wilby** (Environment Agency) highlighted the need to embed adaptation in existing planning systems and stressed the importance of using the latest scientific evidence to inform and design policies. He also highlighted policy-makers' responsibilities to include a wide range of stakeholders in cross-sectoral policy planning.

Members of the audience discussed in further depth NAPAs and argued that their design has been detached from actual policy-making and that most of the work has been conducted by non-African consultants. Further comments were made in relation to the lack of resources to collect climate monitoring data and the difficulties of sharing such data due to lack of confidence among countries and interested parties. Strong emphasis was put in linking both development and climate change communities and the important role played by the African research and policy

community in bringing poverty, vulnerability and climate adaptation debates together under the UNFCCC negotiations.

4. Break-out group sessions

Participants split in four discussion groups which covered four thematic areas: research networks, climate information, livelihood systems and disaster management. Each group was kicked off by a short presentation of the issues by the facilitator and was asked to come up with three to five key lessons/recommendations to be presented in the final plenary session.

Enabling research networks and targeting outputs

This session was facilitated by Tom Mitchell (Institute of Development Studies) and extracted key lessons from climate change research programmes in Africa. It also focused on existing research methodologies and tools for climate forecasting, their ability to provide meaningful information to policy-makers, and discussed ways in which research networks could be used more effectively to improve collaboration between the UK and Africa.

- *Stakeholder involvement in research programmes*

It is important that African individuals and institutions take a leadership role in research programmes and networks and that the latter and their implementation projects become sustained in the long-run. Research programmes often suffer from the loss of key individuals, who move to better paid sectors of African economies as research funding runs out. It is thus critical to invest in individuals, as well as in institutions.

- *Adaptation drivers*

Effective adaptation planning may only be feasible when a centralised and well-resourced decision-making system is in place, which is unlikely to be the case in many African countries. Thus, adaptation processes may be stimulated through the private sector and market innovation, as occurred in the process of adoption of new crop varieties in African rural economies.

- *Drawbacks in current climate research funding*

Research processes do not become "co-produced" to meet the interests of policy-makers. Science donors still operate in short funding time frames and under a linear logic of knowledge and policy production: science defining its own agenda and then informing policy-makers, rather than both science and policy defining together the agenda and working together throughout the process of scientific production.

- *Partnership equality*

Equal partnerships between Northern-based and African institutions, as well as African leadership, in networks and research programmes should be promoted. Several examples in which this is happening already exist and they are likely to consolidate (e.g., African Monsoon Project, EU FP6, START).

Constraints and opportunities for using climate information on different timescales: is climate information adequate for policy?

This session was facilitated by Richard Washington (Oxford University) and focused on identifying the crucial components of integrated climate information and in what ways such integration could be achieved. The discussion was framed around different timescales of interest for climate information with respect to user requirements, uncertainties and priorities for research and better use of information.

- *Short-term (seasonal - five years) timescales are highest priority*

There is clear need to maintain emphasis on 'real time' or short-term timescales in relation to requirements of African farmers. There are emerging examples of more integrated and dynamic approaches which show good potential for bringing together information providers and users, such as linking seasonal forecasting with epidemic disease risk management. The impacts of climate outlook forums have been limited partly because user needs are not always met. By working more closely with specific user groups (health, water), however, some of these problems may be overcome. Communication of information has been and remains challenging, skill varies from year to year depending on ocean-atmosphere conditions, and the demand for sub-seasonal information is largely unmet at present. Credibility is a big issue, for example deterministic forecasts of dry conditions in southern Africa during the 1991/2 season turned out wrong and have influenced the move towards probabilistic forecasts that better represent the forecast uncertainty.

- *Timescales that bridge between current climate variability and future climate change (5 – 20 years) are under-researched*

Very little climate research has been carried out on timescales most relevant to concerns about climate change and the MDGs, i.e. over the next 5 – 20 years. There are important questions about how to approach research on these timescales. The lack of attention is partly because from a climate change perspective the changes in temperature and rainfall are not large, especially in relation to current variability. Specific work needs to be commissioned to connect scientists and users on these timescales but if this is left to chance it won't happen.

- *Timescales beyond the MDGs are important for policy-makers*

There is a need from policy-makers for information on timescales longer than 10-20 years, including post-Kyoto agendas and some infrastructure planning. Policy-makers also want to know the costs of climate change and this is often over the next 20-30 years (2080s is too far away into the future).

The role of climate in livelihood systems and development programmes in Africa

This session was facilitated by Camilla Toulmin (International Institute for Environment and Development) and concentrated on examining the relationship between climate variability and livelihoods, and the ways in which climate change research and programmes could be better integrated with existing livelihood programmes and strategies.

- *Distilling climate variability inputs from those of climate change*

Separating out the impacts of climate change is helpful for showing the scale of the climate change problem whether this is useful to do or not depends on why you want to do it. It is not useful for adaptation purposes but it may be for assigning financial responsibility of climate change. Resilience to climate change is at least in part the same as resilience to poverty. It is not possible to separate the effect of climate change from other multiple stressors.

- *Integrating climate information into livelihood programmes*

The best available climate information can be used to promote resilient livelihoods, but good climate information is not available. Scientists need to have a dialogue with the potential users of climate information (e.g., farmers) to help them produce appropriate information for use in adaptation. This should involve research partnerships using climate information at a local level, for example with seasonal forecasting. However, there is a low capacity to use the outputs of seasonal forecasting as well as it being seen as unreliable. There are also risks associated with the use of seasonal forecasts because of the probabilistic nature of the forecast (i.e., some farmers will lose and some will gain).

- *Taking into account traditional knowledge*

Indigenous people have ways of dealing with risk and planning for variability but such knowledge is not always available to researchers. Scenarios or storylines have been used by some NGOs as a tool to discuss adaptation, and such tools are needed for listening to the voices of communities. However, farmers' observations of changing rainfall or seasons may not be due to real changes in the climate – other factors can lead to reductions in a farmer's ability to feed his family such as declines in soil fertility, increasing family size, land scarcity, and social change, for example. From an adaptation perspective, validation of claims of changes in climate may not be required since farmers will need to adapt to declining food availability, whatever the cause.

- *Holistic approach to livelihoods*

Income diversification is an adaptation process that should not been as a last resort but instead supported as a means of coping and adaptation, particularly diversification away from agriculture into non-farm income. Reliance on rain-fed agriculture makes people particularly vulnerable to climate impacts. Augmenting human capital through education and health care should be recognised as a critical process for enhancing resilience and adaptive capacity. Knowledge exchange and sharing between local users with traditional knowledge, scientists, the private sector and policy-makers also becomes crucial for making livelihoods more diverse and resilient. However, there will always be a need for safety nets to support those unable to manage variability or risk, including appropriate forms of insurance.

- *Multi-dimensional adaptation*

Thus, adaptation is undertaken by individuals and institutions across different scales and it should be seen as a process to be supported rather than an outside intervention that promotes standard or blueprint actions. It is also important to highlight that people are subject to multiple stresses and these often cannot be separated in adaptive practice but it was also recognised that adaptation initiatives may need to separate stressors in order to fulfil funders' requirements. The interaction between these multiple stresses and the subsequent adaptation is context/location specific. Among

specific strategies suggested in order to progress beyond the generalised poverty agenda are: decision support; institutional empowerment; diversification support; market participation; agro-ecology approach or intensification and up-scaling through multiplication.

Learning from disaster management in Africa

This session was facilitated by Maarten van Aalst (Red Cross/Red Crescent Centre on Climate Change and Disaster Preparedness) and examined the synergies between disaster management and adaptation to climate change, the potential to link more effectively the disaster and climate communities, and the existing constraints to improve disaster management in Africa.

- *Synergies between disaster risk reduction and adaptation*

The distinction between climate change and disaster management is rather artificial, and primarily originates from the UNFCCC rather than from practitioners. Disaster risk reduction, particularly at the community level, increasingly includes a whole spectrum of hazards, including trends therein. Better disaster management and risk reduction strategies are likely to increase resilience to climate change and pay off regardless.

- *Existence of communication barriers*

Climate information can be of great value to the disaster management community, including international and local NGOs. However, communication between climate scientists, adaptation policy makers, and disaster management practitioners is sometimes difficult. This partly relates to a lack of good observational data, and of projections of extremes at the right scale and accuracy. Disaster managers, however, readily accept that lack of absolute scientific certainty, and stand ready to reduce risks as a precautionary strategy. They are sometimes frustrated by climate scientists' or climate policy makers' orthodoxy in terms of acknowledging potential new risks. Waiting for statistical significance about trends in extremes in the limited observational data means accepting the occurrence of many disasters before investing in risk reduction. It would be better to act on early evidence, particularly on the basis of no-regrets risk reduction strategies.

- *Reasons for mutual interest*

There has been much less attention and financing for disaster risk reduction than for disaster relief. Climate change adaptation funds could be a good opportunity to channel resources to disaster risk reduction programmes, which would be an effective way to reduce the risks of climate change. However, the disaster management community should improve the documentation and analysis of past experiences in risk reduction and adaptation, including costs and benefits. This could be supported by adaptation research programs. Difficulties in such efforts include the poor quality of disaster statistics, and the efforts required to capture know-how that only resides in local experience. A final reason for mutual interest is that weather-related disasters constitute a window of opportunity to raise awareness for adaptation to climate change.