

INDIGENOUS KNOWLEDGE



COMMUNITY-LED RESPONSES

MEDIA



AfricaAdapt Climate Change Symposium 2011



New voices Different perspectives



POLICY AND PRACTICE

CLIMATE-COMPATIBLE DEVELOPMENT



A very big thanks to...

The AfricaAdapt network would not exist were it not for the funding and support of the UK Department for International Development (DFID) and the International Development Research Centre (IDRC) through their Climate Change Adaptation in Africa programme. We would like to take this opportunity to thank them for their generous and ongoing support.

The AfricaAdapt Climate Change Symposium 2011 was also made possible with the additional generous support from our conference co-sponsors: the Climate and Development Knowledge Network (CDKN); the Technical Centre for Agricultural and Rural Co-operation (CTA); the Institute of Development Studies' Knowledge Services (IDS-KS); and the Africa Climate Policy Centre (ACPC).

AfricaAdapt would like to extend our warmest appreciation to our Advisory Board and keynote speakers: Fatima Denton, Henri Lo, Patrick Luganda, Henry Mahoo, Laban Ogallo, Lindiwe Sibanda and Youba Sokona. The conference was such a success due in large part to their expertise and guidance. We would also like to thank all the participants at the conference for their valuable contributions towards making this a memorable event, sharing their knowledge and experiences with one another through their presentations and lively discussions.

Finally we would like to thank members of the symposium organising committee, whose long hours of hard work made this happen: Patricia Curmi, Binetou Diagne, Nicolas Drunet, Blane Harvey, Mamouda Moussa Na Abou, Jacqueline Nnam, Gilbert Ouma, Abebe Tadege, Marc Williams and Myra Wopereis. We would like to extend this thanks to the wide network of colleagues and supporters who have also been crucial to the staging of this event.

AfricaAdapt is a partnership between the Environment and Development in the Third World (ENDA-TM); Forum for Agricultural Research in Africa (FARA); IGAD Climate Prediction and Applications Centre (ICPAC); and Institute of Development Studies (IDS).

To find out more about the AfricaAdapt, visit www.africa-adapt.net
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New voices, different perspectives: Proceedings of the AfricaAdapt Climate Change Symposium 2011



First published by the Institute of Development Studies for AfricaAdapt

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AfricaAdapt has made every reasonable attempt to ensure the accuracy and reliability of abstracts submitted as part of the symposium and contained in this document. However, the authors and their organisations are responsible for the quality, relevance and accuracy of their research findings, which may not reflect the findings or recommendations of AfricaAdapt or other participants.

What you'll find inside

One publication, hundreds of voices

These proceedings of the 2011 AfricaAdapt Climate Change Symposium have been assembled to share the wealth of research, experiences, and co-constructed knowledge that emerged from the three-day, bilingual symposium with the wider climate and development community.

In this publication we have included short abstracts of all the papers and addresses delivered over the three days of meetings, and provided links to more extended versions of the papers, powerpoint presentations, and other relevant resources.

We have also aimed to capture the important dialogue and sharing that occurred during these three days in the form of participant experience notes, reflective quotes from participants, photos, video clips, and reports from the Symposium's interactive plenary sessions. We

believe that they provide an important contribution to the evidence base and the international dialogue on how to take forward coordinated efforts to address climate change in Africa, particularly in the lead-up to the negotiation at COP 17 in Durban, South Africa.

We also hope that it will serve as a centrepiece to the work that the hosts and members of AfricaAdapt have been engaged in throughout the first phase of its operations, and encourage continued engagement in the second phase of network activities by all those committed to addressing climate change in Africa.

An accompanying CD-ROM featuring all of this content is available for those who have limited internet access.

What is AfricaAdapt?

As a network dedicated to promoting and facilitating the sharing of knowledge on climate change adaptation in Africa, the issues raised in this publication are at the core of AfricaAdapt's activities. Since our launch in 2008 we have built a diverse network of researchers, practitioners, and decision-makers interested in drawing on, and contributing to, the growing knowledge base on Africa's responses to climate change across a range of scales. We have also created spaces for exchange between these communities, and to engage with African media, community representatives, and other relevant actors, in an effort to break down the 'silos' of research and practice that hamper coordinated responses to climate change. The network has brought a particular focus on actions taking place at the local scale and particularly with marginalised communities, actions which are often poorly documented and fail to become part of an evidence base which can inform local and national policy-making.

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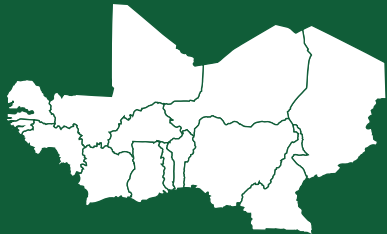
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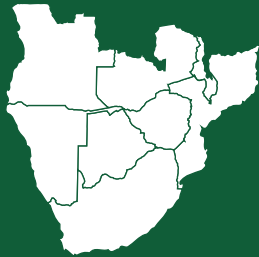
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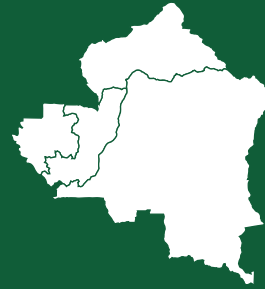
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Introduction: Climate change and the threat to Africa's development

Climate change is increasingly and profoundly affecting Africa's human, environmental, and economic wellbeing.

This will be the case even if major global emitters such as the USA and China commit to making radical cuts to their current greenhouse gas (GHG) emissions. The Intergovernmental Panel on Climate Change (IPCC) has concluded that climate change will negatively affect Africa's agricultural production and food security, water resources, forests and ecosystems, coastal zones, and human health. Recent reports have also highlighted the direct impacts that climate change will have on achieving the Millennium Development Goals (MDGs) in Africa.

These observations reveal how climate change and development on the continent are deeply intertwined, and that the impacts of climate change on Africa stand to be all the more severe as a result of its existing poverty, governance, and economic challenges. For a continent that has accounted for only a fraction of global GHG emissions to bear such severe impacts is a clear reminder that climate change is as much about questions of rights, justice and accountability over the global commons as it is about science.

The stark reality of present climatic impacts and the prospect of future impacts and the injustice they

represent underscores the importance of collective action to both reduce global GHG emissions (so that the worst-case scenarios are avoided), and to work with countries that are most exposed to climate threats and impacts to help them strengthen their resilience and adapt to current change.



Successful action will depend on both finance and good research to inform policy on how to use that finance.

The complexity and uncertainty that are features of the climate and development nexus in Africa also mean that we must collaborate across scales, disciplines, and stakeholder communities, to arrive at solutions that are both practical and sustainable. It is important to note, however, that despite the global scope of the challenge and network of actors called upon to address it, little can be achieved in addressing the impacts Africa is now facing without the leadership and direct engagement coming from the African continent.

“Climate change is as much about questions of rights, justice and accountability over the global commons as it is about science.”

Research and climate policy in Africa in the lead-up to Durban

Until quite recently, the dominant narrative on climate change in Africa has depicted the continent and its people almost exclusively as vulnerable to climate impacts and too poorly equipped in terms of finance, infrastructure, research, and governance capacity to devise ways to address the problem. Fortunately this discourse is slowly evolving to acknowledge the wealth of knowledge and innovation African communities have long used to sustain themselves in the face of change, as well as the new research capacity emerging from African institutions, and to meaningfully engage with the new Africa-based institutions charged with coordinating policy engagement from across the continent.



Numerous examples could be cited here, but the rising recognition of local and indigenous knowledge as effective tools for seasonal climate forecasting, the African research capacity revealed in the IDRC/DFID-funded Climate Change Adaptation

in Africa programme (some of which are featured in these proceedings), and the emerging leadership of the new ClimDev Programme and African Climate Policy Centre under the African Union, African Development Bank and UNECA in Addis Ababa are noteworthy. These and other examples of the growing capacity in Africa featured prominently in discussions at the 2011 AfricaAdapt Symposium. With the forthcoming 17th Conference of the Parties to the UNFCCC being held in Durban, South Africa, the increasing awareness of this African engagement and leadership is particularly well timed.

Despite the rising awareness of these endogenous capacities and resources, there is still a great need for investment in technical and institutional infrastructure and human capacity to deal with climate change on the African continent. Continued collaboration and investment are essential for ensuring that where progress has been made it can be sustained, and that we can continue to wrestle with the persistent economic, technological and power divides at the root of people's vulnerability on the continent.

It does mean, however, that more than ever, decision-making, evidence building, and technical assistance from partner countries or institutions should see partnership with relevant African leadership and knowledge bases as a pre-requisite to any sustainable initiative, be it at local, national or regional scale.

“Countries or institutions should see partnership with African leadership and knowledge bases as a pre-requisite to any sustainable initiative at local, national or regional scale.”

10 bright ideas for African adaptation

The response to the symposium from participants was inspirational. The 117 pages of research outlined in this publication are a brief glimpse into the energy and ideas that permeated the three days of sharing, creating and network-building.

It's a challenge to draw all these voices and perspectives together, but it's important to draw out some overarching conclusions and lessons learned based on the range and focus of papers that were given.

These can be clustered around three key themes: Current research activities and focus in Africa; Networking and collective engagement in tackling climate change; and Funding and capacity to address climate change.

Research activities and focus in Africa

1

Link local scale good practice to national and international policy

There is a great wealth of new research and expertise emerging from Africa on local-scale and community-based action on climate change but more collaborative effort is needed to link this work to national and international policy processes. Efforts at scaling up the good practices happening at community scale remain limited, especially in light of the comparative demand for this work. There may be lessons to be learned from other issues in development which can offer guidance here.

Improve research into understanding and engaging with indigenous knowledge

Research into indigenous knowledge on climate change in Africa, while still new as an area of focused investigation, is growing at a rapid pace and beginning to yield valuable findings. There is a great deal of interest in this area both within and beyond Africa, though further work is needed to understand both priorities and best practices for engaging with indigenous knowledge in Africa, for example in the areas of intellectual property rights and social learning.

2

Deeper linkages between adaptation, mitigation, and low-carbon development

Adaptation to climate change remains the dominant focus of research and action, particularly in West Africa. While this is natural given the priorities and impacts facing the region, there are strong potential benefits to scaling up research and planning on linkages between adaptation, mitigation, and low-carbon development. A good example of where this is now taking place is the work being done on REDD(+) and forestry in the Congo Basin.

3

Place greater emphasis on good leadership, accountability and building on existing successful institutions

Efforts to promote climate compatible development, understood as linking adaptation, mitigation, and low carbon development agendas, must be considered within the particular

4

policy and governance contexts of African nations. Research on politics, governance and development points to the importance of a combination of good leadership, accountability and building on existing institutions that work, making these important features for building successful climate resilient development and low carbon growth.

Networking and collective engagement in tackling climate change

5

Create more African forums for knowledge-sharing

There is a huge appetite for continued linking and networking within and between stakeholder groups working on climate change in Africa. Forums for lesson sharing, capacity building, and showcasing African expertise were highlighted by participating researchers and donors who participated as keys to collective learning, building on good practices, and better coordinated action on climate change.

6

Invest in building the capacity of African media practitioners

Links between media (particularly new media) practitioners and the climate change community remain weak in much of Africa, and coverage is limited beyond reporting on headline-grabbing extreme events. Participants reported that much of the content in African media is simply recycled from international news feeds which may not actually be relevant or applicable in many local contexts. Investment in a closer engagement with media and

building the capacity of African media practitioners to engage with the issues of climate change is essential.

Bring government and other policy bodies into the dialogues

While the Symposium represents an important effort, there is a need for further engagement across many stakeholder groups. Intergovernmental, non-governmental and community-based organisations appear to have strong and well-established linkages to shared communities of practice, and some have reasonably strong links to researchers, but government and other policy bodies are often outside of these dialogues. There is a strong need to strengthen the African policy community's access and capacity to draw upon empirical research conducted in-country to formulate policy. The recently-established African Climate Policy Centre is seeking to do this at a continental/regional scale with the appointment of a cohort of research fellows, but similar efforts at national scales are also needed.

7

Funding and capacity to address climate change

Reflect longitudinal changes in research and have follow-up with participating communities

Investment in supporting applied African research on climate change is having positive impacts on the quality and availability of research in areas such as indigenous knowledge and agriculture/food security. Continued investment into this type of capacity support and building of a research

8

base is important, but there is concern that continued funding of only short-term pilot studies is creating a gap in a longitudinal understanding of change as well as frustration within some participating communities who don't see follow-up on issues that are arising from the preliminary research.

9

Strengthen capacity and availability of resources for non-Anglophone researchers and practitioners

There is a need to strengthen capacity and availability of resources for non-Anglophone researchers and practitioners, who account for a significant percentage of the African climate community. Gaps in research capacity and challenges in making evidence-based policy may be impacted by the language bias (toward English) in international actions, partnerships and resources on climate change.

Improve coordination, better prioritisation, and better alignment of regional actions

The growing number of externally-funded initiatives and overlaying of new policy coalitions on top of previously existing ones is further complicating an already-complicated policy landscape. Given the limited capacity for engagement and competing national priorities within most African governments, there is a need for better coordination, better prioritisation, and better alignment of regional actions with empirically informed national priorities. There is a need to ensure that new initiatives do not further complicate this landscape but rather help governments and their supporting institutions make sense of the complexity and draw on available resources to make informed decisions and policy.

10

Messages from participants...

How do you make a conference truly interactive? The AfricaAdapt Symposium brought together different players in the climate change and development fields. We wanted to ensure everyone input into the knowledge-sharing, as well as the recommendations AfricaAdapt is taking forward to Durban climate talks.

Three days of powerpoints wouldn't have reflected AfricaAdapt's participatory approach. Instead, AfricaAdapt, with support from Carl Jackson (Westhill Knowledge Group), used some new (and fun) techniques – we called it the 'gift garden' – to get just under 200 participants sharing African visions of climate compatible development.

You can read participants' messages on climate-compatible development and gender on page 52, young people on page 97 and agriculture on page 108.



National and International Policy – Linking policy and practice

initiatives in Africa are climate resilient and friendly. We can explore a diversity of local actions and national policies that deliver positive development and climate compatible outcomes. These offer promising options for policies at various levels to be scaled-up through international initiatives to enhance their impacts.

'Africa needs more regionally specific information on the impacts of climate change'

A response by Gareth Martin, DFID

The threats of climate change to Africa are becoming clearer. For example, an increasing threat of water scarcity in many regions could have a huge impact on the rural communities who depend on rain-fed agriculture. Whatever the full extent of climate change experienced, some degree of adaptation is likely to be required in Africa.

In order for adaptation to happen effectively, Africa needs more regionally specific information on the impacts of climate change. We also need more evidence on practical solutions of how to respond to these impacts, to help determine where to concentrate our efforts and resources.

In responding to climate change, it is right to start from a development perspective, as Dr Sokona said, but it is essential that we add a climate change perspective to development. Key sectors, such as water and agriculture, and reduced vulnerability of local communities are likely to be important. There should also be attention to low carbon development, so that development, adaptation and low carbon development comes together in a process of "climate-compatible development".

We need to mainstream climate change into national and international policy-making, taking a holistic approach. We also need practical action on the ground, to explore innovation, and learn from results and experiences, feeding into policy-making and to scale up on a larger scale. This will require coherence between local, national and international policy-making.

What African countries perceive to be key adaptation priorities: Results from 20 countries in the Africa Adaptation Programme

Mihoko Kumamoto and Anthony Mills

Adaptation encompasses a wide range of measures that cut across numerous scientific and socio-economic disciplines. Governments face a considerable challenge in prioritising measures, and in forging multi-disciplinary links to ensure that their adaptation strategies complement existing national development/sectoral strategies.

Adaptation involves different: sectors (e.g. agriculture, water, coastal, health, tourism, etc.); types (e.g. policy, institutional, technical, financial, behavioural); scales (e.g. global, regional, national, sub-national, local); levels of flexibility (e.g. hard- or soft-type); and levels of possible benefits regardless of the extent to which climate change occurs (e.g. low or no-regret options). The plethora of options available for adaptation can create a problem of 'spoilt for choice' and make prioritizing difficult. This is arguably the case for many African countries where adaptation to date has largely been implemented on an ad hoc basis, without systematic prioritizing according to trade offs and benefits across sectors.

This paper addresses this issue by reviewing the priority adaptation options identified within the Africa Adaptation Programme (AAP).

The AAP implemented by the United Nations Development Programme (UNDP) started in December 2008 and is supporting 20 countries across

the African continent to adjust their national development processes to incorporate climate change risks and opportunities. Under this three-year programme, all participating countries spent the first three to six months on studying existing adaptation strategies/policies/actions/interventions, identifying gaps, and formulating priority adaptation measures to address such gaps in a highly consultative manner.

This paper reviews these priority adaptation measures and assesses/categorises them with regard to *inter alia*: a) types; b) priority sectors; c) scale; d) soft versus hard-interventions; e) measures focused solely on adaptation benefits versus low or no-regret measures; f) complementarity with existing national framework for development/climate change; and g) extent to which the measures are based on ecosystem management and/or promotion of sustainable rural livelihoods.

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Redefining Africa's agrarian development policies in the face of climate change challenge: Linking policy and practice

Ernest Molua

The evidence of a changing climate described in the fourth assessment report of the Intergovernmental Panel on Climate Change reveals the reality of climate change and omnipresence of climate's influence to diverse human societies and the natural environment. The acknowledgment of global warming and a changing climate not only reinforce existing constraints to producer groups in Africa, but also present new challenges that shock and stress socioeconomic sectors such as agriculture, which are inherently linked to climate and associated environmental factors. Correcting the emerging challenges would imply a need for business as usual and a redefinition of policy designs, plans and implementation in Africa. This paper puts into perspective the evolution of African agriculture and rural development policies, reviews the challenge of climate change to rural areas and unveils the nexus of climate change and rural agrarian development.

The paper focuses on: a) the elucidation of new policy shifts to maintain human security and enhance levels of social and economic development; b) a redefinition of approaches employed by the public sector in enforcing mitigation and reinforcing rural stakeholders' adaptation to climate change.

The paper concludes that empowering rural areas and producer groups to timely recover from stresses and shocks, and maintain or enhance their adaptive capabilities, will require policy



preference functions that incorporate improved governance and accountable decision-making processes, mainstream climate issues into planning processes; empowers vulnerable communities and boundary partners with climate relevant good quality information, and integrates climate impacts into macroeconomic management. These measures will remain important for a foreseeable future, not only because of the long residency time for greenhouse gases and the potential for reinforcing extreme climatic events now and in the near future, but also because of the moral imperative for public policy to incorporate vulnerability to climate change for development with a humane face.

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State of adaptive capacity to climate variability in semi-arid Tharaka district, Kenya

Charles Recha

This study examined the impact of climate variability and adaptive capacity of agro-pastoralists communities in semi-arid Tharaka district. The study involved interviews with 326 households and 24 representatives of institutions from four agro-ecological zones. Factor analysis results show that livestock, water and income related impacts are the most affected by climate variability, explaining 65.5 per cent of the variance; implying there are non-climatic factors accounting for vulnerability of livelihoods.

In coping with impacts of climate variability, farmers have flexibility as demonstrated by the number and type of crops, and the sizeable land (1.4ha per household) allocated to arable farming. Households further benefit from support programmes such as food relief, seed distribution, installation of irrigation equipment and water tanks for rain water harvesting. These programmes are initiated by the church, government departments and development agencies. Tharaka district has two growing seasons, but infrequent rainfall is a major hindrance to farming and delivery of support programmes.

Households' stability is further affected by over dependency on climate-sensitive livelihoods such

as sale of livestock (70 per cent) and crops (27 per cent) as major sources of income. Although access to climate forecast information has potential to reduce impacts of climate variability, a remote 13 per cent receive seasonal climate but none uses it for planning and farm management. With 64 per cent having barely completed primary school education, access and utilization of technology is a major challenge in Tharaka.

Although there are institutions supporting coping programmes, none considered the application of climate forecast information as a potential tool of enhancing adaptive capacity. The limited interaction between climate science, practitioners and communities increases vulnerability to climate variability impacts. In Tharaka therefore, it would be prudent to address issues of roads, literacy, water supply, employment and science practitioner interaction as part of the initiative to address the bigger problem of climate change adaptation.

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Climate change governance in Africa

Masego Madzwamuse

The negative and unavoidable impacts of climate change are well highlighted, particularly the impacts on the poor and developing countries. It is now clear that Africa will be hardest hit by climate change due to high poverty levels, a heavy dependence on climate sensitive resources for livelihoods and national economies, and a lack of financial, institutional and technological capacity to adapt. Policy makers have recognised the need to integrate climate change thinking and adaptation into all spheres of public policy.

International responses have included additional focus on adaptation in climate change negotiations and an increase in the availability of finance for climate change adaptation.

While these developments are commendable a major limitation lies in the under-development of instruments for climate change adaptation governance particularly at

national level and at local level where adaptation needs to take place.

Appropriate strategies need to be developed based on realities that may differ widely from region to region. Thus, the national and local governance structures must ensure these realities are known to policy makers and mainstreamed into national strategies and programmes. In order to get a better understanding on the status of climate change adaptation governance the Heinrich Boll Foundation (HBF) commissioned eight case studies on Botswana, South Africa, Zimbabwe, Kenya, Uganda, Tanzania, Nigeria and Ghana.

These studies looked at the state of adaptation preparedness in crafting adaptation responses; institutional capacities and arrangements; the levels of public awareness and participation; and the roles played by state and non state actors in international climate change negotiations.

This paper presents a summary of key governance issues emerging from the country studies.

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Vulnerability of urban informal settlements to environmental hazards : A case study of Korogocho informal settlements in Nairobi

Geoffrey Omedo

The Assessment of Vulnerability of Urban Informal Settlements to Hazards study was conducted in Korogocho slums as a response to the emerging world view that urban slums are areas exposed to numerous hazards and disasters. Its main objective was to assess the vulnerability of the Korogocho informal settlements to environmental-related hazards and to propose appropriate hazard-management strategies. With regards to methodology, the study used both primary and secondary sources of data to understand the issues around inherent vulnerabilities in Korogocho.

The study used a random stratified sampling household survey for questionnaire administration, focus group discussion with the Korogocho Community Management Committee, and key informant interviews and observations (using photography) were creatively applied in the data collection phase. The study employed the use of the Community-based Indicators System (Bollin, 2003) for vulnerability assessment at a micro level for after which the indicators were weighted depending on the hazards, exposure and vulnerability and coping capacity.

From the beginning, the study found that the community is highly vulnerable to disease related hazards, floods, fires and droughts that culminate first in famine and then general insecurity. The lack of a cogent land use plan for the area further complicates the problem.

People seem to build anywhere, even within clearly established flood plains and river banks. The study identified a number of challenges in disaster risk identification, management and reduction in Korogocho. These include the fact that urban disasters and risks have been neglected, lack of an early warning plan, weak institutional arrangements to support residents, lack of political goodwill and insufficient knowledge, experience and capacity by the residents.

The study proposes the need for policy makers and stakeholders in Nairobi to support the development of appropriate land use systems for urban areas in addition to supporting research into cheaper but durable housing materials and technology. With regards to the study methodology, the research proposes for support towards the development of a dynamic research model that would serve to provide a real time framework linking poverty and vulnerability within urban informal settlements. This would go a long way in enhancing the adaptive capacity of slum dwellers in Africa's rapidly expanding cities.

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Interests, perceptions and ideas: Institutional framework for combating climate change

Samuel Kimani

Globally climate change issues are widely documented. Several approaches have been developed towards an appropriate and effective mitigation plan, including capacity building and stakeholders forums on sustainable forest conservation practices. Yet diverse thinking from sub-Saharan Africa has helped to create projects that are trying to mitigate and adapt to climate change in unique ways. Payment for environmental services, clean development mechanisms and REDD+ are among the approaches that were applied to combat climate change and improve livelihoods.

In an attempt to understand the link between forest condition and the institutional practice, a study was carried out to establish the relationship between political institutions, research institutions and local grassroots' institutions and their interests, perceptions and ideas in natural forest conservation. Both bio-physical and socio-economic data were collected from two natural forests (Arabuko Sokoke and Kakamega) in Kenya.

Studies were carried out using the International Forestry Resources and Institutions (IFRI) research protocol. The institutional analysis and development (IAD) framework was used for analysis of institutional infrastructure and perspective. The forest and product harvested were used as independent variables while activities carried out in the forest to conserve were the dependent variables. The results indicate that

the traditional participatory approach is the roadmap to combat climate change in Africa, as otherwise the community interests are at the clemency of the other player's perceptions and ideas.

The study recommends that overlapping interests, perception, ideas in common and resource pool management should follow set policies that allow for equitable and sound practices. This will not only provide clear jurisdiction of governance but also enhance transparency in decision-making and equitable benefits distribution, which will set a milestone in combating climate change.



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The policies and practices of adaption to climate vulnerability in Senegal

Aminata Ndiaye

Researchers are leaning towards climate variability and adaptation measures taken by the authorities of Senegal - a coastal Sahelian country located in West Africa. They are examining the primary measures taken at national level by political authorities to combat the threats linked to climate vulnerability characterised by rainfall variability, which has significant impacts such as environmental crisis, decomposition of traditional multi-sector production systems, impoverishment of the rural community, and rural exodus, amongst others.

Conducting an inventory of interventions from socio-economic, institutional, and governance perspectives allowed for an evaluation of the success and failure rates of adaptation measures initiated since the country achieved international sovereignty. Recommendations have also been given which could be implemented or adjusted according to national priorities in order to optimise the national-level strategies proposed.

In this context the researchers were interested in questions linked to climate impacts and adaptation

through national policies, namely management processes, knowledge and perspectives around climate vulnerability and socio-economic capital.



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Initial experiences in climate prediction with the PRECIS model in Central Africa

Wilfried Pokam

Developing strategies for adaptation to climate change requires a good understanding of the future climate. The report by the Intergovernmental Panel on Climate Change developed future scenarios, yet these scenarios were created with general circulation models with scales too large for regional and national studies. These studies require regional climate models on a very fine scale.

Compared to other regions of the African continent, few studies have been conducted on the climate of Central Africa.

This is a clear handicap given the importance of climate prediction for political actors who are interested in making appropriate decisions around climate change adaptation in the sub-region.

This paper presents the efforts of the Center for International Forestry Research, in collaboration with the Met Office of England, to better understand future climate scenarios in the short and long term. The work is still underway, but the paper presents the current status of climate prediction in Central Africa, the methodology

used, and the initial results. The latter has allowed us, based on factors that influence regional climate, to define the appropriate areas for work on regional modelling with PRECIS - in which the model was validated and the simulations for the future climate conducted. The paper ends by giving perspectives on climate modelling in Central Africa.

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“ AfricaAdapt Symposium has been really timely, and it is addressing key issues of how climate change is impacting different sectors in climate change. It is also engaging with the grassroots level, which is very important.”

Henry Mahoo –
Sokoine University
Tanzania

Climate change and adaptation of water resources in the Democratic Republic of Congo

Jean-Pierre Beya Dibue

This study covers 1990 – 2004, a period marked by armed conflict in the Democratic Republic of Congo (DRC), particularly in the east. Considerable environmental degradation has been recorded.

Climate change impacts are already noticeable in DRC, particularly the length of intense hot periods, violent rains, extended dry periods, and increased periods during the rainy season.

This study was conducted based on rainfall data from 17 posts in the following four climatic zones: a) Bas-Congo, b) Kinshasa, Bandundu, Equateur, Province Orientale, $\frac{1}{4}$ Kasai Occidental; c) Nord Kivu, Sud Kivu, Maniema, $\frac{3}{4}$ Kasai Oriental, and; d) Katanga, $\frac{3}{4}$ Kasai Occidental, $\frac{1}{4}$ Kasai Oriental.

The following climate parameters were studied across the country: temperature ($^{\circ}\text{C}$), precipitation (%) and atmospheric pressure (hPa). An overview of greenhouse gases was conducted over the same period.

From this study, an overview of water resources for 2005 was defined in each climatic zone and a projection of the water resource overview for 2100 was identified with the help of climate simulation programme MAGICC-SCENGEN 2.4.

The projections showed that overall

the country did not seem at risk from water resources vulnerability by 2100.

The perceptible rainfall data shows an abridged rainy season moving further towards the extreme south. Katanga for example will experience less than five months of rainy season in the 2020s, as opposed to seven months currently. The country will continue to face temperature increases.



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The socio-political dynamics of the adaptation of migratory herdsman to climate change in the North of Benin

Georges Djohy

Animal husbandry in a changing environment has become an issue of international concern. Climatic factors are added to anthropogenic factors to accentuate the last few decades-worth of degradation of pastoral routes. The protected areas of contiguous ecosystems which make up the areas coveted by herdsman and those practicing other means of livelihood are publicly regulated and are presented as conflicting areas of diverse inter-professional groups. In this respect, the study asks whether animal husbandry can continue to be efficient for nutrition and community well-being.

The study was conducted on a group of cattle from two Peulh communes (Kandi and Karimama) to the north and from Benin; having combined livelihoods and sustainable livelihood approaches and theories of social capital, allowed us to analyse the socio-political mechanisms to sustain these communities of herdsman. Even though they are exposed to the same degree, different herdsman experience climate risks in varying manners, depending on the coping resources to which they have access.

The study distinguishes large, medium and small scale herdsman who manage fairly well in a competitive context of access to agro-pastoral resources. Strategies based on

social networks show community mechanisms for managing risk are increasing: large scale herdsman find themselves with diversified forms of pastoralism (opportunistic, social, client, contractual and guardianship), and; medium-scale herdsman are engaged in agro-pastoralism for security even though the most vulnerable herdsman are reconverting to agriculture and other extra-pastoral activities. This study reveals that there is still hope for livestock breeding for development, which can resist shocks and adjust to new realities to safeguard the practice.

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Links between adaptation
mitigation and low carbon or
climate compatible development

Introduction: Links between adaptation, mitigation and low carbon, or 'climate compatible' development

Fatima Denton, IDRC

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The climate is a key resource and a key hazard, but it is only one exacerbating factor within a complex mix of current vulnerabilities. The ultimate priority for Africa is to reduce poverty. Although there are opportunities where we should engage in both adaptation and mitigation, adaptation is more likely to lift the majority of people out of poverty. At the same time, we must acknowledge that there is no 'optimal' mix of adaptation and mitigation strategies; we need to target where one or both make good 'development' sense. Resilience can more often be developed on an incremental basis, but given the current levels of chronic poverty a transformative process of change is needed. This will involve social actors and systems, institutions and people.

'Narrow the gap between vulnerability and resilience'

As we look to integrate these points into our policies and actions, we need to consider several transitions of particular relevance to tackling climate change in Africa. The first transition is to narrow the gap between vulnerability and resilience, particularly in relation to the agricultural sector. This is an important strategic sector yet it remains highly vulnerable. Key challenges include: enhancing the capacity of the smallholder farmer; improving soil fertility and productivity; enhancing the capacity of local institutions to help local communities; diversifying options and thinking in terms of surpluses; working with key stakeholders such as communities and decision-makers; and addressing

the dependence of the sub-Saharan economy on rainfall through improved water resource management.

'Move between adaptation and mitigation'

The second transition relates to moving between adaptation and mitigation, and can be focused on three key sectors – agriculture, energy and water. Potential strategies for combining adaptation with mitigation within the agriculture sector include: carbon sequestration through reforestation and increasing soil organic matter; improved soil management through reduced fertiliser use; and integrated crop rotation and diversification, and zero or reduced tillage. The energy sector can also make a significant contribution, through exploiting renewable energy sources such as biomass, hydro, solar and wind. It can also promote improved energy efficiency and low energy production systems. The water sector can also contribute through small scale irrigation facilities and the resulting increase in crop productivity and soil carbon.

'Move from a community-based, piecemeal approach to a transformative process'

The third transition focuses on moving from a community-based, piecemeal approach to a transformative process within the context of sustainable development. Pursuing a strategy of adaptive management can provide a viable option for climate resilient development. The strengthening of institutions must also be a critical

“ Resilience can more often be developed on an incremental basis, but given the current levels of chronic poverty a transformative process of change is needed.”

“ We should not pit one response strategy against another; but selectively choose strategies that will bring about the required process of social transformation.”

part of this strategy, as sustainable resource management is largely mediated by good governance and strong institutions that are able to make collective decisions on the environment. Building a climate resilient pathway will also require bridging the research to policy interface, and expanding the knowledge sharing that takes place across stakeholders. Finally, more innovative funding mechanisms and stronger institutions will be required to improve adaptation funding going forward.

In conclusion, there is no such thing as a single optimum development

pathway. The motivation for adaptation and/or mitigation will depend on the level of exposure to a given hazard, situation or context. It also depends on the perception of risks of key stakeholders and their assessment of their individual stakes, values and interests and degree of adaptive capacity. We should not pit one response strategy against another; but selectively choose strategies that will bring about the required process of social transformation. So, it should not be down to a reductionist view on atmospheric concentrations and low carbon development, but rather development that is premised on values, equity, welfare and growth.

‘The vision of climate and development must be harmonised’

A response by Emmanuel Seck, ENDA-TM

It is important to mobilise all levels of decision-making to ensure the success of this low-carbon resilient development approach. At the local level which is laboratory for innovation in terms of design and implementation, the various needs and demands at ground level must be identified, examples should be pulled from pilot projects, and low carbon, resilient development plans need to be implemented. At the national level, the vision of climate and development must be harmonised, and the implementation of local plans need to be facilitated. Finally, at the international level, safeguards for good governance need to be established and financial support scaled-up .

The ultimate success of low carbon, resilient development will rely on a number of factors, among the most important of which are: reconciling global climate change concerns to local development activities; contributing to the reduction of greenhouse gases on a voluntary basis, and thus protecting the global environment; and promoting the participation of vulnerable communities in the carbon markets within the context of renewable energy, agro-forestry and agriculture. This approach should adhere to the equity principle, ensuring the promotion of a more holistic approach to development planning and guaranteeing inclusive participation of all actors.

‘Tough choices about our absolute priorities, but base decisions on robust research’

A response by Natasha Grist

Fatima highlighted adaptation as the main priority for Africa, and whilst mitigation might not be such an immediate priority on the continent, it is important that we incorporate a low-carbon approach into our development practices. Investments being made now are locking us into future pathways for many years to come. We must also ensure that the best available science is involved in the decision-making processes, with the relevant information getting through to the right places and at the right time for decision makers.

How are we going to ensure climate compatible development, integrating both adaptation and mitigation within development? We need to support academic research, enhance research capacity and facilitate its dissemination. All this needs to happen in parallel to challenging current practices: not all adaptive strategies are necessarily positive or economically sustainable. We need to investigate whether poverty reduction in Africa could be best served by focusing on low-carbon growth rather than adaptation. We must foster strong and improved links between policy makers and academics, and build on existing networks and partnerships, as well as supporting innovative start-up ideas. Finally, and perhaps the most critical stage, is to support the climate compatible development policy process, bringing together a broad range of strategies and integrating them effectively.

What are the key challenges for the climate change and development community in Africa over the next two years? Those involved in planning projects need to ‘keep it real’. They need to incorporate the realities of politics, economics and social contexts within their projects and ensure they are designed with flexibility in mind so that they are resilient and adaptable. Funding will always be a challenge, and there won’t be enough funds to do all the projects people want to do: we must make tough choices about what the absolute priorities are, basing decisions on robust research and policy analysis. As priorities growth and equity may potentially clash, so we need to strengthen governments and governance in this area. This better enables them to recognise the key challenges and opportunities for low-carbon development. And finally, we must continue the focus on communication and learning, fostering the networks we have and enhancing dialogues between stakeholders.

Toward climate resilient development: Strengthening the science-policy-institutional-finance dialogue in Africa

Belynda Petrie and Imasiku Nayambe

“ At the AfricaAdapt Symposium I’ve learnt a lot about the initiatives going on around Africa, and how people can be encouraged to engage in climate change issues through the use of media.”

Edith Abilogo
– Center for
International
Forestry Research,
Cameroon

Climate change impacts on most aspects of Africa’s environment, economies and livelihoods. The need to integrate climate change into policy and practice through effective planning is critical in strengthening resilience and reducing vulnerability to climate change. Poverty alleviation and related planning and implementation processes, at all levels, require governing policy with parameters for action. For Africa, adaptation is the primary consideration and urgent action is imperative.

At the same time, international policy on climate change is evolving, through negotiation processes, which include representation of most African states. These international outputs need to be translated into policy and practice ‘at home’ in a process that is aligned to development planning.

This paper focuses on two specific case study examples of how international and national policy can be linked to practice to effect adaptation and climate resilient development. Zambia and Mozambique in southern Africa have recent experiences that are useful in demonstrating methods and approaches in considering links between climate change and sustainable development. Zambia’s Sixth National Development Plan integrates climate change to strengthen the country’s resilience in their poverty alleviation and development planning processes and Mozambique is effectively

incorporating climate change into their disaster risk reduction and prevention processes, with an emerging emphasis on implementing mechanisms to increase their climate financing capacity to enable implementation.

In addition, the paper presents the potentially important role of the Regional Economic Centres and other regional entities in effectively linking international and national policy with resilient development given both long term, more gradual and short term extreme event related climate impacts. The studies consider the practical implications of implementing frameworks and approaches discussed in available literature, as well as those adapted to specific situations.

The paper concludes on the fundamental importance of why climate resilient development planning and policy is important, how to effect this, and what the expected benefits will be, within a regional and national context.

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Climate compatible productive and decent work: A major way out of poverty and the climate trap in Ethiopia

Marek Harsdorff

Ethiopia is facing two major and mutually reinforcing challenges: Ending poverty while at the same time adapting to the negative consequences of environmental and climate change. Ethiopia ranks 157 on the Human Development Index. Life expectancy at birth is 56 years, mean years of schooling are 1.5 and youth unemployment stands at 25 per cent (ILO, 2008). Gross national income (GNI) per capita is US\$ 992 (UNDP, 2010). This development status combined with its highly fragile mountainous ecosystem makes the country one of the most vulnerable regions in the world (IPCC, 2007). Ethiopia's Government addresses these two challenges through its Plan for Accelerated and Sustainable Development to End Poverty (PASDEP, 2006) and its Climate Change National Adaptation Programme of Action (NAPA, 2007).

While a large number of policies, action plans and initiatives exist to address these challenges, this paper analyses the links between poverty and climate change. It focuses on 'green employment to adapt' as climate compatible productive and decent work (Climate and Development, 2010) is the major way out of poverty and the climate trap. It draws on ILO's programme on 'Poverty reduction through decent employment creation in Ethiopia' (ILO, 2010) and combines this with the adaptation priorities as identified in the NAPA.

It shows how to integrate climate change adaptation in development co-operation (OECD, 2009) and how climate change vulnerability and impact scenarios can be mapped (UNDP, 2010a) so as to design climate change adaptation initiatives (UNDP, 2010b). While crop insurance, food security and economic diversification and development ranks highest, this paper develops current work on 'Opportunities and challenges for micro-insurance in Ethiopia' (ILO, 2010) and 'The contribution of organic agriculture to climate change adaptation in Africa' (UNCTAD/UNEP, 2008; IFOAM, 2010) and explores the links between the environment, economy and employment (GHK/ILO, 2010).

The paper concludes with key recommendations and a pilot project document, but the working hypothesis is that climate change and poverty are mutually reinforcing development trends and can be tackled through climate compatible productive and decent work in Ethiopia.

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Climate smart disaster risk management: An approach for climate compatible development

Maurice Onyango and Katie Harris

This paper explores the synergy between climate change adaptation, disaster risk management and other development approaches. Climate change is affecting the frequency and severity of some natural hazards across East Africa, is compounding people's vulnerability and exposure; and is creating greater uncertainty. The disasters community across East Africa is more attuned to dealing with slow onset disasters such as drought. However, as flooding in parts of Sudan in July 2010 demonstrated, disaster trends appear to be changing, and with this, recognition that the impacts of climate change on disasters are more varied than was perhaps anticipated.

As the impact of natural disasters on people's livelihoods increases, 'business-as-usual' disaster risk management will become progressively ineffective if organisations, policies and practices do not take climate change into account.

A holistic Climate Smart Disaster Risk Management (CSDRM) approach is needed that tackles changing disaster risks and uncertainties, enhances adaptive capacity and addresses poverty and vulnerability and their structural causes. The CSDRM approach also presents considerable opportunities for attracting resources

from swelling adaptation funds, as it is a legitimate first step in adapting to climate change and climate variability. In this regard, CSDRM aims to offer a viable delivery mechanism for climate change adaptation resources at national and sub-national levels.

The paper focuses on the experience of developing the CSDRM approach and its relevance to the East African context, specifically Sudan, Kenya and Tanzania. The CSDRM approach has been developed through extensive consultation with more than 500 practitioners, policymakers, scientists and academics drawn from climate change, disasters and development communities. In addition, the paper will reflect on the case studies including the Inades Formation, Tanzania, as a way to demonstrate different components of the CSDRM approach.

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Reconciling participation and benefits-sharing: Policy implications for how Africa adapts to climate change

Leisa Perch

The International Policy Centre for Inclusive Growth (IPC-IG) defines inclusive growth as *'both an outcome and a process. ...Inclusive growth implies participation and benefit-sharing. Participation without benefit sharing makes growth unjust and sharing benefits without participation, makes it a welfare outcome.'* (IPC webpage, n.d)

To-date, achieving the balance between participation and benefit-sharing has not been well-defined in climate change policy frameworks. Poverty reduction, gender equality and climate change policies remain largely segregated, internationally and nationally, and NAPAs have been limited in efforts to reconcile these dimensions. Moreover, as the language of development is increasingly shaped by concepts of 'the green economy' and 'low-carbon development', the boundaries between mitigation and adaptation are becoming blurred.

While estimates predict economic losses as a result of climate change - up to 14 per cent of GDP - if adaptation measures fail to be implemented in Africa (Clements, 2009), it is also becoming clear that the costs of delayed action, ill-defined actions, as well as mal-adaptation, will also have significant social consequences. Women and girls, small-holder farmers and the poorest have been identified in recent research

efforts as needing enhanced attention within climate policy spaces. Thus, the need to secure both participation and real benefits becomes of critical importance, conceptually and in practice.

Through a critical review of the existing normative and operational frameworks as well as select policy instruments, the extent and reach of current efforts are broadly analysed. Furthermore, a number of potential risks arising from the lack of coherence between social and environmental policy, with implications for both efficiency and development effectiveness, are examined.

By emphasising a social risk management approach to climate change policy, opportunities for safeguarding human development progress in Africa while building the foundation for a more inclusive and climate-compatible model of development, are also explored.

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Agricultural land management: Capturing synergies between climate change adaptation, greenhouse gas mitigation and agricultural productivity

Barrack Okoba

Livelihoods of Kenyan farmers are closely interlinked with climate change. Fifty-two percent of the population is below the poverty line, mostly in rural areas. Given the small farm size prevalent among Kenyan smallholders, the lack of capital, including the lack of irrigation development, sustainable land management practices are likely to hold the key to farmer-driven adaptation in Kenya and elsewhere in East Africa.

At the same time, many of the sustainable land management practices that farmers in Kenya and elsewhere in sub-Saharan Africa, employ also directly contribute to reducing greenhouse gas (GHG) emissions.

However, there is little research to date on the synergies and tradeoffs between agricultural adaptation, mitigation, and productivity impacts. To address this issue, the study implemented a farm household survey from July 2009 to February 2010 for 710 households in seven districts and 13 divisions of Kenya spanning the arid, semi-arid, temperate and humid agro-ecological zones (AEZ) of the country.

This paper analyses the synergies

and tradeoffs among climate change adaptation, mitigation, and productivity/profitability, through the assessment of common land management practices implemented in the study sites, climate change adaptation options chosen by farmers, mitigation options for crops and livestock simulated by modeling tools, and productivity/profitability impacts calculated based on survey data.



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FAO-MOSAICC: The FAO modelling system to support decision-making for agricultural impact assessments and adaptation

François Delobel, Hideki Kanamaru and Michele Bernardi

The Food and Agriculture Organization of the United Nations (FAO) is currently developing an integrated toolbox to study climate change impacts on agriculture called FAO-MOSAICC (Modeling System for Agricultural Impacts of Climate Change). This toolbox comprises a number of models for climate data downscaling, spatial interpolation, hydrological modeling, and crop and economic simulations, to be used sequentially. While MOSAICC can be used for a wide range of analyses (climate change impacts on water resources, crop yields etc.), the ultimate objective is to assess the effect of changing crop yields on national economies and what would be the most robust adaptation strategies to adopt in order to reduce the potentially adverse effects of climate change on national food security.

The models were chosen for their robustness, their ability to work with minimal input data, and their portability, in order to facilitate applications in different countries and agro-climatic areas. The simulations are carried out at fine spatial resolutions and aggregated for impact assessments at national level.

The models are all connected to a common spatial database and have been made compatible in terms of

data input and output. This way, data produced with one model can be used by the next. The models and the database are hosted on a central server to which users have access through web interfaces. The system can be installed on both Linux and Windows servers.

Capacity building and technology transfer is a focus of the system as it will be distributed with documentation and training programmes for use by local researchers from relevant technical institutions. The primary intended use is country-wide studies, but the application can be at sub-national or regional levels. Currently under validation in Morocco, MOSAICC will be implemented in two African countries in 2011.

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Biotechnology as a tool for improved agricultural yield as a result of climate change and a solution to increased global warming due to agricultural activities

Maurice E. Oyoo

Climate change results in drought due to moisture stress because of higher temperature and lack of rainfall, thus threatening elements essential for life such as water, food, health, land and the environment. Among the worrying consequences of climate change are declining crop yields, ocean acidification, malnutrition and heat stress, population displacement and threatened ecosystems. This is more so in light of a growing global population, a declining area under agricultural production, as well as a rise in the sea level.

The changing meteorological conditions associated with climate change will have an impact on agricultural yields. Due to the emerging consequences of climate change, and the existing problems on food scarcity and food quality, biotechnology is relevant for developing countries. A number of African countries are already engaged in biotechnology research that is being shaped by food security issues, growing poverty, and a decline in agricultural research funds.

New technologies must be developed rapidly to caution farmers against declining food security as a result of climatic changes. Moisture stress, water-logging, heat and salt tolerant crops with similar or superior yields to ones currently adopted by the farmers must be developed to address climate change. Agriculture also contributes to global warming and its activities currently

accounts for about 25 per cent of greenhouse gas emissions.

It accounts for 14 per cent of CO₂ emissions and it is a major source of methane (CH₄) (48 per cent) and nitrous oxide (N₂O), (52 per cent). Implementing sustainable agricultural practices is therefore important. Biotechnological tools can be used to engineer crops that will enable farmers to adapt to the use of less fuel consumption during farm operations and to practice reduced or no tillage during their farm operations. GMOs can help decrease the necessity and frequency of spraying as well as tillage leading to more carbon in the soil becoming oxidised through exposure to the air and therefore less CO₂ is released into the atmosphere. From 1996 to 2005 the cumulative permanent reduction in fuel use was estimated at 4,613 million kg of CO₂ (arising from reduced fuel use of 1,679 million litres). The adoption of reduced tillage or no tillage systems in respect of fuel use resulted in reductions of CO₂ emissions of 89.44 kg/ha and 40.43 kg/ha respectively.

Therefore agricultural biotechnology techniques must play a role as one of the solutions available in the fight against climate change, especially in regard to greenhouse gas emission reduction, crop adaptation and crop protection, and increased yield from less available arable land. The benefits of growing GM crops are diverse and have already proven to be particularly relevant to developing

countries because the benefits already experienced allow for less labour intensive and a more simplified method of farming, whilst at the same time providing a higher crop yield in the climate changing environment.

Presently, the developing countries primarily benefiting from GM crops are situated in Asia and South America. There is need to create awareness on biotechnology foods in Africa and the setting up of relevant bio-safety policies to stimulate adoption among Africans.



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“ The symposium has been exciting, it is refreshing to hear people talk about community initiatives, and one thing is clear – that scientists are not there to teach communities to adapt, as they are already doing it.”

Lindiwe Sibanda –
FANRPAN

Incidence of indigenous and innovative climate change adaptation practices for smallholder farmers' livelihood security in chikhwawa district, southern Malawi

Tennyson Magombo

Prolonged dry spells or droughts and floods as a result of climate change are a serious problem for smallholder farmers in Malawi, because agriculture is their main livelihood strategy. Food shortages and low-income levels due to climate change impacts mean farmers are unable to actively participate in day-to-day economic activities. Low-income levels can also be translated into lack of access to basic needs that require purchasing with money. Farmers that have mainly been affected by this problem are those that have land allocations in the Shire River Valley in Chikhwawa and Nsanje Districts.

This paper assessed the incidence of innovative indigenous climate change adaptation strategies for smallholder farmers' livelihood security in Chikhwawa district. Factors that affect adoption of such strategies were also analysed with a multinomial logit model.

The study revealed that crop diversification, eating a wild tuber plant called nyika (*Nymphaea petersiana*), applying organic manure to agriculture fields, mixed crop and livestock farming, and small scale irrigation are the main indigenous climate change adaptation strategies being adopted by households in the study area.

The study also shows the major factors that significantly affect adoption of indigenous climate change adaptation strategies are: household size; landholding size; total annual household income level; access to input and output markets; number of months households had no maize or sorghum as a proxy to food insecurity level; and access to agricultural extension services.

In terms of policy implications, the identified indigenous climate change adaptation strategies should be promoted by the farming communities, responsible government departments, the donor community, civil society organisations as well as the private sector, if farm families in the study area and other areas in Malawi are to build resilience against climate change impacts and have sustainable livelihoods.

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Access to energy services as a tool for reinforcement of rural community resilience

Todéman Assan

Climate change is at work and its impacts are most noticeable in least developed countries such as Benin. According to the fourth IPCC evaluation, impacts will be visible in development systems and sectors. This situation further increases the degree of effort needed to achieve the MDGs and notably supplying the demand for energy for various uses.



The energy demand in rural areas is of most worrying in Africa. In Benin, the rate of electrification is 2 per cent and biomass energy is the most used form providing over 60 per cent of the nation's energy.

However deforestation increases

climate change impacts. Faced with the challenge of energy needs, it is advisable to rethink energy planning. Even though energy is at the heart of development, it should not be considered an end in and of itself. It should be seen as a means to accomplish specific tasks which contribute to the improvement of social and economic well-being.

Thus, it is important to understand to what exactly the energy is contributing, and the minimum amount of energy required to accomplish the given task. Proceeding in this manner puts an end to haphazard electrification which only increases the supply of energy.

Applying this method to the Benin energy sector's development strategy will prove its contribution both to the satisfaction of energy needs and to resource preservation.

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Climate change: Building a bridge between adaptation and mitigation with the Congo Basin forests

Anne Marie Tiani

The IPCC experts (2007) showed that the policies seeking the reduction of perverse climate change impacts on natural and human systems cannot be fully effective unless they are integrated both into adaptation and mitigation measures. This complementarity integration helps better respond to the needs and interest expressed at various levels by various stakeholders. Adaptation measures attempt to react to multi-form climate change impacts; mitigation measures aim for the causes, by reducing CO₂ emissions from deforestation and degradation or by stabilising emissions using appropriate mechanisms.



Furthermore, even if it is agreed that the forestry sector offers the best opportunities for synergy between adaptation and mitigation, there are currently very few substantive examples and little knowledge to

confirm this idea.

To close this gap, the International Centre for Forestry Research through the COBAM (Climate Change and Congo Basin Forests: Synergies between Adaptation and Mitigation) project, funded by the African Development Bank, is developing tools and methods which will help to analyse the synergies and conflicts between mitigation and adaptation in the forestry sector. The goal of the project is to contribute to the increased understanding and information-sharing required to formulate policies which effectively address the two approaches to fighting climate change. This paper presents a conceptual basis for the synergy between mitigation and adaptation, the needs of the Congo Basin countries in terms of knowledge and capacities related to climate change overall, and the means by which the COBAM project will seek to address them.

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Example of traditional conservation ecology of certain plant species in the savannah regions of Northern Cote d'Ivoire

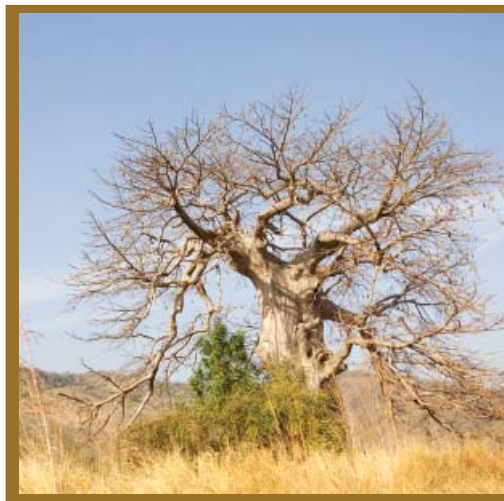
Mamadou Bamba

Traditional agricultural practices in northern Cote d'Ivoire, inherited from ancestors and perpetuated over time, require farmers of the savannah regions not to destroy certain species to clear a new field. This practice presents a risk for cultivation. These species given their size can offer a screen to crops near the ground from exposure to sunlight, an actor in the photosynthesis process.

There are approximately ten species, the primary being *néré* (*Parkia biglobosa*), shea (*Vitellaria paradoxa*), baobab (*Adansonia digitata*), *Ceiba pentandra* and *Tamarindus indica*. To justify the protection of these species, communities conjure up socio-economic reasons or spiritual reasons such as some of them are spirits that bring rain. Today the practice of crop-blocking with cash crops destroys all vegetation (e.g. felling and logging) and extend crops as far as the eye can see in defiance of the ecological conscience of communities who end up experiencing drought which may not have otherwise existed.

This study notes that the harnessed agriculture introduced and developed in the Ivoirian savannahs, even when facilitating cropping of large surface areas is done differently. The species to be protected are avoided during cultivation and ploughing which is done in a manner that protects

them. To facilitate the survival of the ecological conscience of environmental protection, the Korhogo Rural Committee (ARK) supports communities to identify and valorise local knowledge which allowed their predecessors to construct mechanisms which protected nature. The strategies identified have been recognised as a means of fighting climate change.



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Initial efforts to promote climate change adaptation in the Congo Basin, an area with high mitigation potential

Denis Sonwa

Even though efforts to respond to climate changes include mitigation and adaptation measures, in central Africa this last category does not yet seem to get much attention. REDD+ (Reduced Emissions from Deforestation and Forest Degradation and conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries) has an important role considering its potential to maintain carbon stocks large forests, but also the ecological services (biodiversity) that can be associated with it.

Despite the high potential for vulnerability linked to communities' reliance on climate-dependent natural resources, adaptation is not yet a major concern. Initiating brainstorming, consultations (scientific-political discussions) and conducting pilot initiatives allow for progressive integration of actions to reduce the vulnerability of communities and natural resources in the sub-region.

This paper reviews the initiatives undertaken in the COFCCA project (Congo Basin Forests and Climate Change Adaptation). The ultimate goal of these initiatives seeks not only to reduce the vulnerability of carbon stocks, but also to reduce the fragility



of rural forest communities in the face of climate disturbances.

This paper presents: a) mitigation efforts in the Congo Basin; b) the initiative to promote forests and climate change adaptation in the COFCCA project; and c) the discussion to increase the integration of adaptation in natural resource management in forest areas based on lessons learned from this project.

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What role should intellectual property rights have in access to clean technologies?

Loumou Bikoun Alain Désiré

Adaptation of tools and production processes in African countries wanting to focus on clean development, in accordance with the fight against climate change, implies the use of less polluting technologies whose output is more efficient. However in a number of cases these technologies are protected by intellectual property rights, which subject their access to costs which countries are hard pressed to cover in their socially-oriented budgets.

This situation, under the work of the United Nations Framework Convention on Climate Change, gives rise to questions about the capacity of these countries to pursue efficiency while simultaneously adapting their tools of production and socio-economic development. In other words, can African countries utilise the system of intellectual property rights to more flexibly access the clean technologies necessary for their engagements to adaptation without condemning their socio-economic development?

Reactions to these questions and the advancements at the Cancun Summit in Mexico recommend the analysis of

the multilateral system of intellectual property rights and technology transfer, as well as the international framework for the environment, to appreciate the role of the instruments which may supply African countries with access to respond to these needs.

Similarly, there is the issue of funding this transfer, given that the costs incurred are an element of consideration for African countries, which are not the biggest beneficiaries of the Clean Development Mechanism (CDM).

This study is crucial measure the utility of the intellectual property rights system and the transfer of clean technologies for infrastructural adaptation and production processes for a cleaner development.

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Community Led Responses –
From local to global

Introduction: New Thinking on Community-led Responses: From Local to Global

by Lindiwe Sibanda, FANRPAN

View presentation

Social and economic aspirations of rural communities and the national developmental agenda remain detached as a result of top-down approaches. Community-led responses are a fundamental prerequisite for linking research, policy and practice. There is a frequent, but often unacknowledged disparity between research and policy agendas versus actual community needs. My organisation, FANRPAN, has used theatre for policy advocacy as an innovative tool for communicating community-led responses and connecting on complex global challenges such as climate change and food security.

To set the scene, we can identify three major challenges: the establishment and capacity enhancement of inter-sectoral research teams; the need to involve communities in vulnerability assessments; and the use of innovative tools to enhance communication and move the development agenda from local to global levels.

Community engagement in research and the use of culturally appropriate communication tools in policy dialogues are critical ingredients

for community development. The lesson learned is that community-led responses should be based on respect for local cultures, as this creates a conducive environment for the operation of science and policy development. At national, regional and global levels language is rarely a barrier; hence multi-stakeholder dialogues have proven effective in policy advocacy.

There is a need for an Africa-led climate resilient development agenda that demystifies climate change, promotes inter-sectoral and community participatory research and maps the household assets to better develop evidence-based policies aligned to community needs.

The take home message is that Africa needs validated evidence to help 'push' for a post-Kyoto policy framework that recognises the multiple benefits of agriculture and its potential contribution to climate mitigation. The clarion message for the upcoming UNFCCC COP 17 conference, to be hosted on the African soil, should be: "No Agriculture, No Deal".

“ There is a need for an Africa-led climate resilient development agenda that demystifies climate change... to better develop evidence-based policies aligned to community needs.”

Activist profile: Mualalem Birhane Lieh and Wubalem Mengist Sewagne

(main photo, with Lindiwe Sibanda, centre)

Mualalem and Wubalem lived in Ethiopia during the devastating droughts of the 1980s. Witnessing famine and death around them, the husband and wife dedicated their lives to environmental protection and social justice. Seeing climate change as a major reason they and other Ethiopians were suffering, they campaign in local communities and lobby their government and the UN.

To tackle the huge problem of deforestation in their country, Mualalem started a tree-planting project. Their hard work has led to the land transforming from eroded dust to a forest that provides berries, flowers and a natural spring that locals can drink from. Mualalem and Wubalem have also planted Vetiver grass. This wonder grass can offer communities multiple benefits: it captures water, it traps CO₂, it's good for the soil, it can be used for handicrafts, and the roots are edible.

The couple work with other development agents to share knowledge and learn about new technologies that are then combined with their own understanding of local solutions. Mualalem points out that he's proud to play a part in teaching the younger generations to deal with these issues, and coordinates with schools in the region to celebrate events like World Environment Day.

Wubalem is a social entrepreneur who engages with local communities to move from open traditional stoves to fuel-saving stoves. Cooking is now cleaner and less smoky: as a result boys (who previously refused to enter the smog-filled kitchens) are now being taught to make Injera as well as girls.

Both Wubalem and Mualalem campaign at international events, including COP15 in Copenhagen, to raise awareness of the environmental issues that they face. They have also worked with Nobel peace winners Al Gore and Wangari Mathaii, and are part of a campaign against pollution that has been supported by a petition signed by 5 million people.

Disentangling vulnerabilities: A participatory assessment of priorities for climate change adaptation among smallholders in Kenya

Carla Roncoli and Barrack Okoba

This paper reports on a participatory assessment of climate change perceptions and adaptation priorities conducted among rural producers in five study sites, representing different agro-ecological areas of Kenya. The outcome of participatory discussions was coded for salience and analysed across genders and agro-ecology. Awareness of climatic changes was found to be widespread, particularly in relation to changes in precipitation patterns. However, climate stresses are understood and experienced in the context of other vulnerabilities and uncertainties which often undermine efforts towards adaptation.

In elucidating impacts of climate change, respondents stressed the intersections of drivers and effects, across the multiple dimensions of agricultural production, livelihood diversification, environmental conservation, water availability and quality, health and nutritional status, and social stability and security. Findings point to the need for policy and programmatic responses which foster synergies between climate change adaptation and sustainable livelihoods.

Water infrastructure (for irrigation and domestic use) emerged as an overwhelming priority for all groups and zones, having direct linkages to livelihood and health goals. Other identified priorities included technical inputs (e.g.. planting materials) as well as institutional supports (e.g. affordable credit, fair markets, capacity building, and organisational

development). Participants also called for improved governance at multiple levels, particularly to ensure greater accountability and transparency in the management of common resources and public services, more stringent regulation of input supplies, market cartels, and lending schemes, and a safer environment for travel and trade. In sum, this assessment highlights the systemic nature of climate vulnerabilities and the need to go beyond technical fixes, to connect adaptation and mitigation policies to efforts to promote institutional capacity and empowerment at the local level.



“ The diverse group of participants at the AfricaAdapt Symposium from many regions will enrich the conference... it will also enrich my own work through finding out about the work of others.”

Sale Abou – Institut de Recherche Agricole pour le Développement , Cameroon

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Community-based adaptation for local empowerment and global influence: Methods and practice from the Adaptation Learning Programme for Africa

Fiona Percy and Cynthia Awuor

CARE's Community-based Adaptation (CBA) framework provides a holistic analytical approach for communities to plan adaptation actions which are informed by climate science and local observation of climate change. The framework recognises that effective adaptation requires a comprehensive set of interventions including identifying more resilient livelihood strategies, disaster risk reduction and building of adaptive capacity, which result in development and empowerment of vulnerable communities to manage climate change impacts.

Sustainable and replicable local responses to climate change also depend on addressing underlying vulnerabilities and ensuring favourable policy frameworks.

The presentation shares lessons from CARE's ALP programme in Ghana, Niger and Kenya. It focuses on community owned and gendered analysis for adaptation planning which reaches and empowers the most vulnerable within a community, linking communities to climate information and the role of civil society in influencing local



to global policy and planning for adaptation.

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“ We have a lot of information, and without sharing we will end up repeating this work or keep living in ignorance of it... I will connect through AfricaAdapt with many new contacts and networks who have attended the Symposium.”

Barrack Okoba –
Kenya Agriculture
Research Institute

Participatory climate change adaptation building on local innovation

Yohannes GebreMichael

The challenge of climate change calls for action to help affected people deal with the new conditions. For people directly suffering the impacts of climate change, macro-level policies are meaningful only when accompanied by micro-level initiatives that support local climate change adaptation (CCA).

Partners in Ethiopia, Nepal and Nigeria within the international multi-stakeholder PROLINNOVA (PROmoting Local INNOVATION) network recently explored the relevance of the PID (Participatory Innovation Development) approach to CCA at local level. PID involves multi-stakeholder experimentation that builds on local ideas and initiatives.

The study sought primarily to:

- Document local experimentation in response to a felt need to adapt to climate change
- Draw lessons on the potential influence of local innovation processes on climate change adaptation policies and programmes.

Though the initial focus was on local innovations, it soon became clear that responses to climate change involve not only new practices.

The communities studied in the three countries have long histories of dealing with considerable climate variability,

and have developed over time what are now considered 'traditional' practices to cope with extreme weather conditions. Even if climate change is not an isolated factor for these people, the study showed that their capacities to innovate to adapt to changing conditions is an important element in reducing vulnerability. There is currently a high risk that CCA is treated in a top-down way.

The study revealed the potential for a bottom-up approach, in which local innovations and practices serve as starting points for a more participatory approach to CCA, drawing on the strengths of each stakeholder group. Studies of how local people respond positively to challenges related to climate change are important to help inform policymakers and other stakeholders on the role of local creativity in CCA, and to trigger a process of recognition and reflection.

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Investigating how development interventions increase community-level adaptive capacity in Ethiopia

Kirsty Wilson & Million Getnet

In Ethiopia, climate change impacts are inextricably inter-twined with current vulnerabilities and development challenges. Climate change adaptation must therefore integrate measures for adapting to future changes with development work to reduce vulnerability to current impacts.



The Africa Climate Change Resilience Alliance (ACCRA) research hypothesises that building communities' adaptive capacity is a central part of this integrated approach. However, as yet understanding of the impact of current development practice on adaptive capacity remains limited. To respond to this ACCRA developed a Local Adaptive Capacity Framework (LACF), which lays out five distinct yet interrelated characteristics of adaptive capacity, with the underlying assumption that positive impacts on these characteristics should enhance a community's adaptive capacity. (Jones et al., 2010)

Haramaya University has used the LCAF in Ethiopia to understand the contribution being made by CARE, Oxfam GB and Save the Children UK, to communities' adaptive capacity. This paper explores the findings from Kaseja kebele, a lowland agricultural area in West Hararghe zone of Ethiopia, where CARE is implementing the HIBRET project. Unsurprisingly it highlights the interplay between climate impacts and other vulnerability factors such as deforestation, population pressure on land and poor road and market access.

The research shows how approaches that combine disaster risk reduction, natural resource management and sustainable livelihoods approaches can improve communities' ability to adapt. Using analysis of how local institutions control access to resources, how different kinds of information and knowledge is used, and how effective innovation can be fostered, the paper makes a number of recommendations for CARE and for policy makers and practitioners working in similar contexts.

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Cows to kilowatts: Methane emission from anaerobic digestion of abattoir waste turned into clean energy

Joseph Adelegan

Food processing wastes from abattoir, dairy products, brewery and other agro-industries are a major source of water pollution and greenhouse gas emissions, especially in the developing world. Specific regulations for industrial waste do often not exist or are poorly enforced. This represents an immediate environmental problem, affecting aquatic life and also portends serious human health risks.



Moreover, the anaerobic degradation of wastewater generates methane and carbon-dioxide and thus accelerates climate change. The way out of the dilemma was to find a way of capturing the gas emissions and turning them to productive usages. Relevant technology for achieving this was created by an African Environment Research Institution in association with Thai Technology Innovator.

Our pilot bioreactor dubbed “Cows to Kilowatts” is located at Ibadan, the largest indigenous city in Tropical

Africa. About 1000 heads of cows are slaughtered daily with the wastewater discharged directly into open drains and faecal matters dumped in heaps. The waste potentially reaching 4,000mg/l of biochemical oxygen demand in local rivers, surpassing the international threshold of 30mg/l. and 60% of the local population uses water from hand-dug wells vulnerable to contamination.

The Cows to Kilowatts model pioneered a new model of waste management that treats slaughterhouse effluent at the source and converts harmful greenhouse gases into clean energy through social enterprise. The innovation deploys a cutting-edge anaerobic fixed film bioreactor technology to treat abattoir waste and produce low-cost biofuel, generating biogas more efficiently than conventional biodigester technologies. This also reduces water pollution and greenhouse gas emissions and provides a sustainable and cheap source of energy and fertilizer in Nigeria. The model also leapfrogged the need for effective governmental regulation for waste treatment by offering a profitable solution

The captured methane is used to drive gas generators to provide electricity for power starved poor communities. The sludge from the reactor is upgraded and used as environmentally safe organic fertilizer for low income farmers. This result is more efficient fertilization of farm lands against chemical fertilizers and reduces non-point source water pollution.

This new waste-treatment model is revolutionizing traditional practice in slaughterhouses, contributing to safer living environments and boasting economic viability for the local economy. Operated as a social business, the profit is being invested into similar waste-treatment facilities in other locations, further increasing the beneficial impact.

The average size of the bioreactor is 5000m³ designed to capture about 1,800m³ of methane per day and generating about 0.5MW of electricity off-grid for power starved poor communities and with emission reduction of about 0.2MT of CO₂ per year. Operated as a social business with sound business model, the plant generates return on investment after 2 years. With an estimated lifespan of 15 years, the plant creates substantial economic returns and virtuous cycle of

sustainability.

The innovation adopt environmentally-benign technologies and sound business model to create lasting solution to the problem of organic wastes which also minimises carbon footprint and creates green power in an economically self-sustainable and profitable manner, generating a classical win-win situation. The model is being replicated across Africa.

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Participants' messages on gender

1. Equitable access to assets – this is necessary for women and men to play full and empowered role in production and reproduction in the context of climate change (technology, finance, natural capital, social transfers). Access for girls and women would be a priority in most cases.
2. Value women's knowledge within mainstream sectors - knowledge management, communication and the media would be engendered and women empowered by increased access to education and information.
3. Give women an equal voice in decision making in climate compatible development.
4. Start from the grassroots – mainstream the needs of men, women, boys and girls into policy from grassroots, through national to international levels.

Adaptation to climate change by a natural resource dependent rural community of Gogonyo, Pallisa, Uganda

Mercy Mwanikah Ojoyi

The values and benefits attributed to water resources, land and the environment in sub-Saharan Africa are great. However with varying climatic patterns, highly ranked sectors such as water and agriculture, along with changing land uses are facing major challenges that remain uncertain in the years to come. This study explores the potential benefit of integrating socio-economic and climate scenarios, in order to tap into the expertise and perspectives of locally important stakeholders in potentially sensitive sectors within the Wami/Ruvu River catchment in Tanzania.

Participatory scenario planning was used as a tool to think of the future with 84 selected small holder farmers and their leaders across six villages within the catchment. Triangulation of some of the information was captured with 199 household quantitative surveys.

The outcome is the participatory development of three thematic scenario categories featuring land use, water resource use and management, and agriculture. The results indicate that changes in climate will influence land use, agricultural productivity, and water resource use and management.

The use of participatory scenario planning has proved to be a useful

tool in development planning, while taking into consideration interacting risks and uncertainties. This tool may be adopted by local farmers, leaders and regional institutional frameworks, and policy makers, to improve the responsiveness to any unexpected changes and risks coupled with integrated collaborative management.

Rain-fed agriculture remains the backbone of rural livelihoods in the catchment. This means an expansion in crop farming and diversity, which contributes to soil loss and a decline in soil fertility, as well as a decrease in arable land leading to lower crop yields. This shows the need for suitable, yet at the same time sustainable, water use and management systems, and land use and farming practices, that will increase productivity through resilient to climate change impacts.

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Traditional knowledge of indigenous peoples in the face of climate change: Adaptation of nomadic pastoralists in Chad

Hindou Oumarou Ibrahim

Indigenous peoples are amongst the first to directly suffer the consequences of climate change given they are directly dependent on the environment and natural resources, and because they sustain a close relationship with the earth.

With climate change the structural vulnerability of indigenous people is exacerbated through political, social and economic marginalisation, the plundering of their lands and natural resources upon which they depend, and the violation of their rights. They are the primary victims to suffer the consequences, for example, changes in seasons, temperature increases and increased wind speed, have negative impacts on pastures and vegetation typically provoking floods in certain areas and dry spells or food insecurity in others.

Climate change brings significant changes to ecosystems. Users and holders of traditional indigenous knowledge are key actors in nature conservation and have direct responses to climate change.

The role they can play in the fight against climate change should thus be reconsidered since they actively contribute in a natural and traditional way to ecosystem regeneration. Unfortunately traditional knowledge is rarely considered in public debates and national, regional and international treaties. Leaders are more interested

in the financial opportunities surrounding climate change issues than talking about the people who suffer and their vulnerability. The absence of consideration in decision-making spheres is thus the primary challenge to be raised.

It remains to be seen how governments can learn from local responses and knowledge of indigenous peoples to define national policies which truly facilitate adaptation, rather than policies which destroy or infringe upon these responses.



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“ The symposium has opened my eyes to what is happening in other places in relation to climate change. I am a lecturer, and I will strengthen the understanding and awareness of my students to climate change, so that these issues are incorporated into their research and they can help develop solutions.”

Omobowale Mobolaji
– University of
Ibadan, Nigeria

National strategy for prevention and controlled management of forest fires in Benin to fight climate change

Mathias Affoukou

Forest fires are one of the major cases of natural resource degradation in the Republic of Benin. Destruction of plant-cover by fire is encouraged by a reduction of carbon sequestration capacities in the trees and the soil. Forest fires increase with climate change, but also contribute to releases greenhouse gases. Thus, managing forest fires is seen as one of the primary areas of intervention necessary to protect and sustainably manage forest resources to reduce the negative impacts of climate change. Research into the national strategy to prevent and control forest fires in Benin has allowed for the identification of new categories of forest fires depending on socio-cultural practices.

A study of the effects and impacts of forest fires led to the development of a national strategy for controlled management of forest fires which is based on six pillars: 1) improving oversight of forest fires' controlled management; 2) institutionalising the controlled management of forest fires; 3) development of capacities to manage information and monitoring and evaluation; 4) development of technical capacities to manage uncontrolled fires; 5) education and communication for controlled fire management; 6) research – development and capitalisation of alternative practices to inappropriate productive uses.

Analysis of the legal framework, of actors and of mechanisms for fire management helped to demonstrate several experiences and lessons to draw from these issues in term of management of forest fires in Benin.



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The role of capacity development in unleashing community responses to climate change adaptation

Matt Reeves, Paul Cowles, Graham Wood and Olga Yakimakho

Pact discusses its framework for strengthening the capacities most relevant to supporting adaptation to climate change in Africa. This paper provides real world examples from the Democratic Republic of Congo, Kenya, Ethiopia, and other countries. It also consolidates a concise set of recommendations for policymakers, NGOs and development agencies.

Climate change is introducing new challenges to communities, organisations and governments across Africa. Meeting these challenges will require individuals, organisations and institutions at local, national and international levels that are capable of strategising, mobilising and coordinating above and beyond their 'normal' day-to-day work. What are the key skills and abilities that will pay off for stakeholders in Africa as climate change intensifies?

Pact draws upon its Global Summit on Capacity Development (November, 2009), where participants from around the world underlined the importance of developing adaptive capacities in organisations, institutions and communities, rather than the traditional focus on technical and operational capacities. These include the ability to analyse, plan, and change activities and approaches based on the best available data and better networking with others. Pact proposes that these adaptive capacities form the key building blocks

needed by these actors as they face the uncertainties of climate change.

The paper shares lessons learned from many years of work successfully developing these kinds of adaptive capacities: in Ethiopia, building long-term partnerships with local organisations to increase their confidence in dealing with government officials; in South Africa, developing the monitoring and evaluation capacity of local organisations to collect, manage and learn from their experiences; and in Kenya, helping community-based organisations to manage nature-based businesses and the natural resources they depend upon.

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Climate migrants searching for adaptation. Mbororo herdsmen in northern DR Congo

Félicien Kabamba Mbambu

A large part of African agriculture is rain-fed. With the acceleration of climate change, large changes in agricultural seasons significantly impacts human and animal food security. If agricultural production needed for human nutrition is increasingly impacted, food stocks intended for animal consumption has become both rare and costly. This deficiency linked to climate change poses real adaptation problems for African herdsmen often travelling several kilometres from the Congolese border. Locally they are known as MBORORO.

The absence of national policy regarding adaptation in their respective countries leads these pastoralists to emigrate towards northern Democratic Republic of Congo where climate conditions offer good business opportunities.

The basic postulate which guides this reflection rests on the fact that pastoral activities are a basic determining socio-economic factor for these communities and thus their

vulnerability increases at the speed of climate change. Therefore, migration is as a primary means of expressing adaptation.



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Climate change, fisheries and community health: The need to share the knowledge as a way to improve local adaptation strategies with small-scale fishing communities in Ganvié, Benin

Bertrand Joël Foe Eloundou

As climate change continues to pass scientific predictions, local populations continue to suffer the impacts in various social sectors. In the lakeside community of Ganvié, Benin, climate changes are visible to communities who experience them daily. The evaluation of climate change impacts and local adaptation strategies amongst small-scale fishing communities in Ganvié, funded by IDRC offers the elements for analysis and specific intervention.

Based on discussions, interviews and daily community experiences, the changes observed and their impacts on fishing are already visible. Fishing production has reduced and household revenues, engendered by the sale of fishing by-products produced by women, have also decreased by over 50 per cent. Amongst the various immediate consequences are difficulties of access to primary health care, particularly for simple malaria, due to household revenues.

To face these challenges, fishermen adopt adaptation strategies such as the use of an enclosure for aquaculture on the lake. However against all expectation, the materials used to

construct the enclosure contribute not only to deforestation of neighbouring sites near the lake as well as other areas but also to pollution of the lake's water.

This last consequence clearly contributes to the disappearance of certain species. In addition, by wanting to adapt, the fishermen introduce new pressures to their environment, already fragile from climate change. The period of fish maturation remains a gap period and extreme vulnerability for fishing families. For all of its limits, the study concludes that the introduction of adequate information remains a sustainable issue to improve local adaptation strategies in order to avoid ambiguity in solutions to the problems.

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Securing agricultural production through climatic micro-insurance in Burkina Faso

Isabelle Dabire

Over the last decades West Africa has experienced significant changes in the rainy season, both in terms of the quantity of water but also in terms of timing and area (Maurizio, Lorenzo, Andrea, Idrissa, Birama, and Mamadou, 2008). Burkina Faso, like other counties confronted by this problem, researches improved adaptation strategies. Numerous studies have been conducted on integrated water resource management, drip irrigation systems, conservation techniques, and conserving and restoring degraded soils such as the zaï (OUEDRAOGO, 2008). Producers often find it difficult to adopt innovative strategies, which are often too costly and require financial support. However, microfinance always refrains from giving producers credit because the agricultural sector remains a complex industry with a daily rhythm of uncertainty given climate hazards. Producers tend to use seasonal provisions as a means of supporting production decisions in terms of the choice of seeds, crop rotation, etc.

However, the impact of an error on seasonal provision is significant for agricultural production and thus on household revenues.

This study allows for an evaluation of the needs for securing agricultural production through the micro-insurance concept. This involves the establishment of a process for implementing insurance based on climate indexes that indicate the most exposed climate risks and the highest risk in the given activity. In addition, the study presents the willingness of producers to pay an insurance premium.

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The roles of media and
intermediaries in translating,
sharing and advocating

Introduction: The roles of the media and intermediaries in translating, sharing and advocating

by Patrick Luganda, NECJOGHA

View presentation

In recent years the climate change debate has moved to the top of the global political agenda. Africa and the developing world are most threatened and affected by the impacts of climate change. There is a growing urgency to ensure that the public is informed about climate change issues. The public also needs to be given opportunities to participate in the debates and take informed action. As the world grapples with how to effectively deal with climate change, communicating to the public is becoming recognised as an effective intervention to build resilience among communities and across nations.

Communicating climate change presents us with a fundamental challenge. Telling the climate change story, its causes and effects, and the ways in which we can contribute in the fight against it, remains a difficult task for any party involved. For the scientific community, governments, the media and nongovernmental organisations, communicating it in a simple, clear and persuasive manner has not been totally successful.

Increased interest or ‘environmental’ fatigue?

Moreover, competing positions still exist regarding the severity of the phenomenon and the appropriate collective response. While some recent polls have revealed increased public

interest in a number of issues relating to climate change effects, others point to a certain fatigue regarding the whole subject of the environment. Public support is essential to adopt the necessary national and international policies to mitigate and adapt to climate change. The growing trend in public opinion should concern us all as it threatens adaptation efforts among the public.

Climate change communication requires skills in interviewing, investigating, interrogating, communication research, reviewing, reporting, listening and learning. It is a combination of all these skills that leads to an understanding of the issues at hand. We need to understand climate, weather, climate change, climate variability and climate vulnerability.

Identifying and understanding the audience

At the same time, understanding these issues has to go hand in hand with identifying and understanding the audience and building the credibility of our sources. The information we gather, sieve and disseminate must be relevant and should stimulate action and help to solve everyday challenges faced by humanity. These include food security, poverty reduction, personal, community and national security. It includes wealth creation and collective

responsibility leading to community action.

Suffice to note that the media are not experts, but rather jacks of all trades. The media itself needs to adapt to climate change by building capacity to communicate climate change effectively. Traditionally the media is thirsty for news, whether this may be on conflict, controversy, scandal, alarmism or gossip - these make headlines and sell the news. A word of caution is needed to avoid negative

publicity, and to avoid getting in the news for the wrong reasons. Scientists, if you have nothing to say, keep quiet; and for the media, if you have nothing to report, do not report.

As a way forward we conclude by noting that the media was previously dormant in communicating climate change, but it has now moved from a passive stage through to reactive, and now to the proactive stage. We need to become pre-emptive by moving towards in an advocacy role.

Advocacy on a shoestring: getting your voice heard (in under 160 characters)

by Jacqueline Nnam, AfricaAdapt Knowledge Sharing Officer

The interactive session on the final day of the symposium focused on creating advocacy messages based on issues identified as important by the participants. These messages were to be short and attention-grabbing, something that participants could take away from the symposium and use for their own advocacy strategies especially for COP17.

Participants identified issues related to the symposium themes and wrote them on cards. The cards were then pinned on what we called an “ideas

board” strategically placed by the coffee area.

Each group crafted a short catchy message by responding to the following questions that could be shared via SMS and Twitter:

1. What is the most important issue related to the theme?
2. How can the issue be addressed?
3. Who can make it happen?
4. What do you need to say?

The advocacy messages they created are on the opposite page.

Participants co-create SMS and Twitter messages

What people currently think and do must inform policy formulation and implementation.

Bring the missing voices to the climate change decision-making table.

The climate change challenge is an opportunity for development. Help the vulnerable to adapt to change, mitigate impacts and reduce poverty.

Invest in media for climate and development, innovative capacities, and enhanced access to information for all.

Without indigenous knowledge systems, adaptation to climate change will fail.

Integrating indigenous knowledge systems with modern science widens options for climate change adaptation.

Youth, don't give up. We have a solution to adapt: you have knowledge and potential. We'll give you the resources.

Building and retaining community trust: The role of media and intermediaries in translating, sharing and advocating

Sarah Murabula Achola

The principal objective of this paper is to demonstrate the crucial role that the mass media plays in information dissemination, translation and advocacy. The media creates a platform for discussion of an issue and establishes what the boundaries of that discussion will be. The media acts as a link between policy makers and the people affected by the instituted policies, thereby giving the community at the grassroots a voice. Community voices can be conveniently ignored in the din of policy debate. The mass media, especially the news media can amplify voices so that policy makers cannot ignore them.

The desired product in media advocacy is the ability of community members to be heard and to exercise influence over the policy environment. By gaining access to the news media and framing problems from a public policy perspective, community groups can apply pressure strategically to key decision makers to change environments.

Media advocacy helps create a trained group of media advocates and builds the capacity of the community for further change thus empowering them to stop practices that worsen the impacts of climate change, and through community organisation and coalition building educate them on the correct methods of disaster prevention and preparedness.

The media and other intermediaries such as community-based organisations are responsible for sharing information. This is particularly important with disseminating information on early warning systems in disaster prone areas.

Africa, being the worst affected continent by the prevailing climate change needs a reliable source of information that the community can use to get timely news on impending disasters and the correct procedures to follow to avert the disaster or move away from the disaster area. The reliability and the accuracy of the information is key to establish a level of

trust with the associated community.

The media is also responsible for presenting information to the community in a way that is easily understood and interpreted by them, hence the need for translation. In most rural communities, the language of communication is the related community's mother tongue. Therefore, the media is charged with the responsibility of getting the information, understanding it and finally translating it to the community in a language that is easily understood by them.

The media should therefore integrate these three components in a manner that is beneficial to the community in order to foster education, understanding and trust, in order to ensure it is effective in its function as the voice of the community.

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Community radio, action research and advocacy for climate justice: Lessons learned from Ghana

Blane Harvey

Community radio is well-recognised as a powerful vehicle for advocacy and social change in Africa, but its use in the field of climate change has remained very limited, and largely for top-down transmission of information to communities (Myers, 2008; BBC World Service Trust, 2009). This paper discusses lessons learned to date from the 'Climate Airwaves' action research initiative, which is aimed at developing new approaches for supporting community radio broadcasters to investigate, communicate, and engage in broader debates on the impacts of climate change on vulnerable communities in Ghana.

It outlines the forms of partnership and support that have been developed between two African networks on climate change and community radio and a UK research institute; the participatory evaluation approaches being used to capture the learning from and impacts of this partnership; and the lessons learned for future collaborations of this nature. It also

discusses in depth the central role that action research aimed at effecting social change plays in this particular initiative and in climate justice initiatives more broadly.

Lessons learned to date have highlighted the challenges of addressing complexity and uncertainty appropriately, the importance of framing climate change in the context of rights and duties, the role of sustainable partnership models, and how this work can contribute to a longer-term vision of capacity for broadcasters.

“ The exchanges at the symposium were dynamic both during the procession of presentations as well as during lunches. The smiles and kindness erased the language barriers... It was a great pleasure for me to discover AfricaAdapt, which I didn't know before, and to continue to collaborate on climate change.”

Dieudonné Kete –
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Communication of coping and adaptation strategies for climate change in tropical regions in East Africa

Juanita Schlaepfer-Miller and Eugenio Tisselli

Digital communications technologies have become an important and pervasive medium in our daily lives. Internet usage is still low in Africa, reaching about 10.9 per cent of the population; yet it has grown 2,357.3 per cent over the last ten years, almost five times more than the rest of the world. More than a third of the population in Africa are cellphone owners, and this rate is growing fast.

Beyond their standard modes of operation, such technologies can be used to empower overlooked communities, by giving them an unfiltered medium through which their voices can be heard. Projects in which cellphones and web pages are appropriated by marginalized communities and used to their own benefit, such as megafone.net, are a proof of what can be done to achieve community empowerment.

In this project technologies are used to empower communities of rural farmers, by enabling them to speak for themselves and raise their issues publicly in an increasingly connected world. A project was initiated with a group of farmers in the Bagamoyo District, Tanzania, in which they use

shared multimedia cellphones to report their observations of the effects of climate change on their farms. By using a special cellphone application, the farmers can send tagged images and audio recordings directly from the fields to a web page. These multimedia contents can be immediately published and visible on the Internet, creating a body of evidence that is collected in a participative way.

To begin the process of thinking in a visual way about the climate change issues affecting their farming practice, a rich pictures workshop was carried out with the farmers. This enabled them to map out in a pictorial way some of the systems and structures they work within. In order to augment the informational richness of the materials collected by the farmers in Bagamoyo, we use folksonomies and geographical mapping.

Folksonomies are aggregations of keywords, also called tags, applied to digital contents by individual users in order to describe them. Yet, even though using tags to describe content can be considered mainly an individual activity, the aggregation of

tags produced by an online community evolves into a common, coherent vocabulary which is created in a bottom-up fashion.

The mobile phones used by the farmers in Bagamoyo have integrated GPS modules, through which geographical coordinates can be obtained. The cellphone application, which was specifically developed for this project, takes advantage of this possibility by attaching geographical information to images and sounds, making it possible to locate them on a map.

In addition to presenting our project we proposed to the Africa-Adapt community the idea of using a system of tagging for videos and other media projects loaded on the network website.

This would enable a searchable folksonomy so that the content of videos could be easily found.



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Bridging the gap: Experiences of communicating climate information between producers and end-users in southern Africa

Clare Davis and Katherine Vincent

Climate change information is difficult to communicate beyond the scientific community, due to its inherent uncertainty and complexity, yet at the same time end users need access to the information in a format that is appropriate to them, in order to bring about sustainable responses. This requires a concerted two-way communication process between information producers and information users, and is often best facilitated by a 'boundary organisation' or professional science communicator. This paper outlines several attempts made at bridging the gap in the southern African context.

As a forum working to coordinate their preparedness and response activities among humanitarian organisations (UN agencies and NGOs), RIACSO is actively trying to incorporate climate risk information. A boundary organisation has been facilitating dialogue between information users and providers, which has involved several stages: raising awareness among RIACSO members on the availability of existing information; feeding back to scientists an evaluation of this and associated 'wishlist' of information and its packaging that would be useful to their programming activities; and then organising for the scientists to comment on scientific

progress in terms of what would be possible, or is currently impossible, in the light of existing climate science. As a result, a dialogue has now begun, brokered by the boundary organisation with the ultimate aim that salient climate information is made available to end users in a format that is appropriate to their needs. At the same time, scientists know that their information is being actively embraced in decision-making and programming.

South Africa's Department of Science and Technology recently published a Risk and Vulnerability Atlas that presents selected findings regarding global environmental change impacts in sectors such as agriculture, health, biodiversity, water and South Africa's coastal/marine zone. Case study projects, such as within the Kruger to Canyons Biosphere Region, involved stakeholder dialogues to determine how information on environmental change can be successfully utilised to guide and inform adaptation strategies.

Given the intended audience of local government and individual professionals without specific climate change training, production of the atlas was done by a professional science communicator, who

designed it for use by a non-specialist audience, whilst retaining integrity of the scientific findings. The Atlas is currently being extended into Southern African Development Community (SADC) countries in order to build capacity amongst the SADC member states in understanding information on climate risk. As with the South Africa example, active consultation with end-users will inform the exact content, format and packaging of the final product to ensure maximum utility.

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“ At the AfricaAdapt Symposium I gained a lot on the use of indigenous knowledge and the modern and scientific knowledge, and that it is better we work within the two pools of knowledge.”

Ngenwi Annabella
Abongwa – Institute
Of Agricultural
Research For
Development,
Cameroon

Scaling up local knowledge using innovative online knowledge management tools

Jillian Dyszynski and Sukaina Bharwani

This paper documents lessons that have been learnt in facilitating knowledge exchange and the processes that help scale local knowledge to regional application. There are many hurdles to overcome in creating such a space such as how to break down the barriers that prevent people from sharing information. This can be resolved by increasing trust in the platform and its objectives, which in turn can only be achieved by addressing the very particular concerns of different contributing communities. Making the benefits clear – the ability to learn from different knowledge networks, the increase of knowledge sharing capacity, improving potential collaborations, building on existing research and avoiding replication – must be balanced by creating a sense of collective ownership of the resource with full attribution of content.

An example is weADAPT.org which is an online ‘open space’ that allows users to access credible, high quality information on adaptation issues and to share experiences and lessons learnt with the climate adaptation community. It is designed to facilitate learning, exchange, collaboration, synthesis and knowledge integration, to build a professional community of

practice on adaptation issues, while developing guidance for adaptation planning and decision-making.

Further ways to improve trust, knowledge sharing, dissemination and integration are explored, including ways to make information even more accessible, the opportunities to share more inclusively and broadening the types of information that are available, e.g. from indigenous knowledge to down-scaled climate data. In addition, such knowledge management tools do not fully serve their purpose if they do not support the institutional change that is essential to improving adaptation decision-making processes. Different approaches that are being developed to achieve this with such online ‘shared spaces’ are also discussed.

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Climate change, mediation and mediatisation in Southern Africa: Towards climate change journalism

Admire Mare

Climate change has become an issue of concern for media in recent years. Given the primacy of mediation and mediatisation in modern societies, this paper argues that development journalism, which treats audiences as citizens while prioritising public listening and deliberative citizenry on climate change discourses, is the missing link in current advocacy strategies.

This paper demonstrates that representations and news discourses on climate change in selected South African and Zimbabwean newspapers have largely been framed within the strictures of the global scientific hegemony which gives primacy to alarmism, technocratic jargon, and officialdom. Such reportage has so far been instrumental in the creation, reproduction and circulation of top-down approaches to climate change adaptation, which obfuscates the role of indigenous knowledge systems and constricts voices of the poor in local debates.

It also argues that the advocacy and translation role of media in Africa is being constrained by the dearth of science journalism, media commercialisation, and urban bias of newsrooms. In a context where climate change is threatening to wipe out livelihoods of billions of people, the media is crucial for the dissemination of truthful information on weather forecasts and disaster warning to the public in the climate information cycle. It argues that both the traditional and citizen

centric media are important cogs in the climate information cycle as information disseminators, mobilisers, translators, environmental scanners, platforms for debate, and fora for intercultural learning. In short, the media has a role to restore the 'voice' to those threatened by climatic changes. It makes a case for citizen journalism as an antidote to the publisher-centric agenda of climate change debates. It also calls for the introduction of climate change journalism courses as part of curricula in order to create a critical mass of well-trained science journalists instrumental in mobilising and sensitizing their communities.



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The role of community radio in climate adaptation

Charles Chikapa

Radio continues to be the most accessible medium of communication in Malawi. While new technologies, from wireless devices to blue-tooth to high-speed Internet seem to be everywhere, radio is highly regarded as one of the best communication tools for reaching the rural poor. Radio is popular, reaches a wide audience and is affordable and accessible. Farmers listen to local news, stories, and music in their own language without needing to be able to read English or French. In the last decade new techniques such as phone-in shows, live community forums, and radio diaries are making radio an interactive forum.

Community radio is effective in poverty reduction. Access to voice, information, and knowledge are vital factors in facilitating the achievement of poverty reduction and sustainable human development as 'voicelessness' is a key dimension of poverty and exclusion. The Malawi Broadcasting Corporation (MBC) and other selected community radios partnered with Farm Radio International by working in some areas of the country using radio as a mobilisation tool. Through this arrangement smallholder farmers are assisted to solve farming problems, using 'participatory radio campaigns'. Broadcasters work with farmers to identify concerns and broadcast good practices, using weekly programmes in local languages. Farmers are involved through field visits, interviews, competitions, phone-ins and texts.

The Project was launched in April, 2007. It is a 42-month action research

project supported by the Bill and Melinda Gates Foundation. Its aim is to assess the effectiveness of farm radio on meeting the food security objectives of rural farming households in Africa. The paper aims to share with participants the mid-term review evaluation results of the project. Based on the lessons learnt from the pilot project, the paper demonstrates that community radio is an effective mobilisation tool for Community-based development initiatives, including adaptation to climate change.



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Emphasis on shaping media discourse on forests and adaptation to climate change in the Congo Basin

Edith Abilogo

Media can play an important role in shaping the debate on climate change. In Central Africa where efforts to address climate change are oriented on attenuation initiatives and solutions, adaptation to climate change remains in an early stage. The Congo Basin Forest and Climate Change Adaptation Project (CoFCCA) funded by IDRC and hosted by CIFOR was developed to support the policy dialogue around forest and climate change adaptation in the Congo Basin. Media within the region appear to be among major actors who can make this possible, although they show certain limitations in their intervention in this arena.

This paper reviews the situation of media communication in the forest and adaptation to climate change sector. It shows the dynamics and initiatives conducted by CoFCCA in the sub-region in order to develop and enforce media discourse.

These include: 1) a media science-policy dialogue workshop; 2) scholarship support to master students from communication schools and; (3) partnership with journalists networks. For each activity, the paper presents: a) why it was an important activity to develop and what the objectives were; 2) what was implemented already and; 3) what was achieved, the lessons learned and the way forward.

The paper ends by highlighting key points of discussion around the need to continue science-media interaction within the Congo Basin and how to capitalize on this experience.

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The media, art and cultural centres are the main climate change messengers

Komlan Mawuena Adjoyi

The media is a transmission channel that is more efficient when it is associated with other intermediary means, which impassion the target audience. The NGO AFHON-Togo experienced this through the ASCA project.

The project's main objective is to accelerate information sharing on climate change by mobilising and engaging art, sport and culture professional. It targets groups in agriculture, sports, private sector, media and arts (music, visual arts, comedy, poetry, cinema and fashion, etc.).

The project working with the media and other intermediaries has accelerated information sharing on climate change through translating messages, producing and sharing information, as well as advocacy work.

For example, comedians and singers were brought together a workshop where they brainstormed on how to translate the messages in their production. This resulted in a musical composition on climate change in French and in the Ewe national language by the artist Charl' OZZO. Hundreds of CDs of the song were distributed to participants of local and foreign media.

In addition, the national television channel (TVT), radio stations (Nana FM) and newspapers dedicated several special editions to climate change. For example, the show ECO-MODE held a fashion show using recycled



(corn and rice sacks, and leftover material) and natural materials. It was held at the Goethe German Cultural Centre and attracted a large crowd.

Indirect advocacy through media coverage helped influence wider public opinion on climate change, as well as to deliver advocacy messages to prepare for a discussion with decision-makers who pay great attention to the media. The use of the media increases the project's credibility in the eyes of decision-makers and increases the chances of gaining access to them. Copies of the CDs were also sent to decision-makers, representatives of international organisations, and the media, for use within their activities.

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Media and climate change in Senegal: The Impossible agenda?

Minielle Tall

Despite the training offered to journalists of local press in Senegal to encourage more frequent coverage of issues linked to climate change in the media, the majority of the Senegalese population still finds it difficult to grasp the tangible dimension of climate change and its economic, human and social consequences.

very few elements of response and understanding to its audience facing the observed changes.

This fact undeniably harms the advocacy efforts from stakeholders through various programmes funded by the primary partners.

The goal of this presentation is to present the typology of the primary obstacles which challenge journalists in their coverage of information linked to climate change, to pose an approach which suggests that all concerned actors (journalists, technicians and researchers, and communicators) should engage in a systematic approach which goes beyond capacity building of the press to also promote the continuous availability of constructed knowledge (vs. learned knowledge).



“ It was a great opportunity to learn and network and to really think through issues for Africa.”

Leisa Perch –
International Policy
Centre for Inclusive
Growth, Brazil

In print, radio and television the articles and broadcasts that address climate change are rare and mainly not well followed. They often coincide with an international press conference (rebroadcast of international news) or a national one (superficial coverage of a press briefing) and often bring

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Means of disseminating information on climate change in Congo-Brazzaville

Noé Emmanuel Mbemba

The African population is 80 per cent rural. The Republic of Congo is 65 per cent covered by forest and 35 per cent by savannah, which makes it a predominantly forested country. These geographic zones are made up of forest and represent 10% of the dense humid forests in Africa. The rural population is 45 per cent of the total population. Given their agro-pastoral activities (slash and burn agriculture, fabrication of charcoal, sale of firewood, sale of non-timber forest resources), these communities greatly influence environmental degradation and thus the climate. It is important to note that the majority of these communities, which are strongly attached to forest resources, are predominately illiterate.

In Africa, the greatest challenge is access to information. The institutions in charge of addressing and disseminating knowledge are under-equipped and don't have qualified staff. In the media it is hard to find specialists on environmental and agricultural issues. In all of the national programmes developed, there is no communication or awareness planning. There is thus a gap between the public, decision-makers and researchers.

However, there is agreement that the role of information is critical and that for development to take place access to information is required. In the Congo, efforts have been taken to validate research activities through the media and information dissemination organisations such as libraries.

Thanks to support from FAO, CTA and FARA, synergies are being developed to reach populations immediately concerned by climate change, through innovative approaches such as dissemination of documents translated into local languages, establishment of centres for response similar to SQR, and by using mobile telephones (SMS module).

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The role of cinema in information dissemination on climate change: Cinécom Laroche-BG in the Central African Republic

Dieudonné Kete

Cinecom Laroche Production-BG is a company created in early 2010 in Bangui, Central African Republic, to fill the country's void of film production companies. However even before 2010, the company was creating small films and documentaries.

This presentation seeks to demonstrate the importance of media in the dissemination of information on climate change. Cinecom Laroche Production-BG has made environmental documentaries such as *'Les collines du Bas Oubangui se remittent au vert'* ('The Hills of Bas Oubangui are becoming green again', 26min), *'l'OCDN, une ONG au service de l'environnement et du développement durable'* ('OCDN, a NGO for the environment and Sustainable Development', 1hr), and *'Les pygmées Aka de la Lobaye, victimes de la deforestation'* ('The Aka de la Lobaye Pygmies, Victims of Deforestation', 13min).

The first copies of these films were shown on national television and received diverse reactions; many appreciated them, others with constructive criticisms on technical aspects of their production. Currently, corrections are being made to the files, while other films have

been sent to international film festivals in Africa and Europe.

The public's positive reaction to the various films demonstrates the importance of the media in awareness raising around environmental protection.

Unfortunately due to lack of resources, the aesthetic aspect is sacrificed and many communities in the back country have not yet seen these films. It should also be noted that Cinecom Laroche Production-BG has not received any grants since its creation and functions on its own limited funds.

Although there is still much to be done the study shows the power of the media, even if limited, on the literate as well as illiterate population with respect to raising awareness and protecting nature.

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Roles of local and indigenous
knowledge in addressing
climate change

Introduction: The roles of local and indigenous knowledge in addressing climate change

by Henry Mahoo, Sokoine University, Tanzania

View presentation

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 where 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 variability by using IK in weather and climate prediction. Prediction of impending disasters has been an integral part of their adaptation strategies.

'Lack of research into accuracy of IK forecasting'

In spite of all these benefits, IK is faced with several challenges. One is a 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 cannot 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 only type provided by national meteorological departments of most countries. At 'field' level the information is not applicable and most stakeholders including farmers cannot use the information to assist in decision making.

Combine indigenous knowledge and scientific forecasting

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, input 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.

“ Local communities in different parts of southern Tanzania have been coping and adapting to increased climate variability by using IK in weather and climate prediction.”

Activist profile: Mohammed Alyi Ahmed and Abdela Alyi Mohammed

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.

‘We must first understand the decision-making structures of the farmers’

A response by Evans Kituyi, IDRC

A significant number of communities across Africa rely on local and indigenous knowledge to inform their decisions, and will 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 missing. 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 in Kenya and Tanzania have reported great success.

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.

Policy issues in integrating indigenous knowledge in climate risk management to support community based adaptation

Maria Onyango

Many African communities have used indigenous knowledge (IK) as a critical knowledge base and survival tool for adapting to extreme climate events and other natural hazards. IK may be defined as an ancient, communal, holistic and spiritual knowledge that encompasses every aspect of human existence. Local communities through accumulated IK have gained from generation to generation: known patterns of weather; how and when local natural disasters occurred; and how to plan to cope with their impacts on the natural environment, livelihoods, and lives. According to research, many African communities have developed techniques and strategies for forecasting and managing climate variability, including coping mechanisms to respond to both the normal and harsh conditions of their local environments. They base their forecasting on observation of the natural environment including flora, fauna and stars.



This paper discusses the close linkage between sustainability of community

livelihoods and lives. Extreme climate variability such as floods and droughts often have far reaching environmental, health and socio-economic impacts in many developing countries. To counter this trend, there is the need to have in place efficient and realistic climate risk reduction strategies, including availability of effective integrated early warning systems to enhance the planning efforts.

This would reduce the negative impacts, take full advantage of positive impacts, and encourage adaptation to climate change. Reducing this vulnerability calls for community-based adaptation through empowering local communities to take action on their vulnerability to climate variability and change. From a development point of view, wider access to knowledge and information will help reduce climate risks and inequalities within a community by opening up opportunities for vulnerable members (women and youth) to benefit from integrated climate knowledge and strategies. In addition, management and conservation of biodiversity will enhance the integration of scientific and IK and therefore the resilience of the communities.

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Agro-ecological knowledge and climate change adaptation in North Central Namibia

Andrew Newsham

Ovambo farmers in north-central Namibia possess and deploy agro-ecological knowledge which has given them, over hundreds of years of settlements, no small measure of resilience in the face of considerable climate variability – especially inter-annual rainfall variation and its associated impacts. Recent research from Omusati, one of the four regions of north-central Namibia, documents the potential role of knowledge co-production between agro-ecological knowledge and agricultural science in strengthening adaptive capacity to future climate change (and not just to current forms of climate variability).

However, scope remains for developing a deeper understanding of the conditions under this kind of co-production, which is by no means automatic. This paper explains how agro-ecological knowledge constitutes adaptive capacity, and considers how we might better understand the kind of knowledge co-production likely to



lead to positive adaptation outcomes.

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“ I made contact with community media, policy makers, development organisations, researchers and practitioners.”

**Philip Otieno –
Young Greens,
Kenya**

Climate change adaptive capacities in the traditional livestock system of southern Africa based on indigenous knowledge

Elder Moonga

A study conducted through community participatory approaches from selected areas of a rural district in Zambia, determined how the traditional livestock farmers interpret the increased prevalence of livestock diseases to climatic changes, their vulnerabilities with respect to conventional diseases control methods and their optimism for survival dependent on indigenous knowledge systems (IKS). The general low livestock productivity trends in southern Africa can be directly linked to the presence of a wide range of diseases.

The traditional farming communities have lagged behind modern scientific advancements due to inadequate government extension services; few disease diagnostic and service provision centres; inadequate marketing infrastructures; changes in disease control strategies caused by economic liberalisation; and the prohibitive costs of imported chemo-therapeutic and chemo-prophylactic materials. The study established the farmer's ability to correlate the increased disease episodes in recent years to increased vector populations (ticks and tsetse flies) that are dependent on climatic factors.

For the southern African region, climatic change predictions favour speedy vector developments and probably their spread to new areas, rendering traditional farmers more

vulnerable to livestock disease outbreaks. Presently, the conventional methods of diseases control are not sustainable by the rural resource poor farmers. Alternatively, the farmers are beginning to adaptively utilise their IKS. *In vitro* studies validated the efficacy of *Tephrosia vogelli* to major tick vectors.

Based on this validation, the Southern Africa Network of Biosciences (SANBio), through its Livestock Development Node, is undertaking a regional developmental research programme aimed at biodiversity utilisation by promoting *T. vogelli* in the traditional farming communities. So far, the farmers readily appreciate the cost effectiveness and sustainability of the plant materials.

The values being realised from the utilisation of *T. vogelli*, is expected to generate additional interests into more applications of IKS for various livestock management practices in relation to climate change vulnerabilities.

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The use of agro-biodiversity by indigenous and traditional agricultural communities in adapting to climate change

Paul Bordoni

Over the past two years the Platform for Agrobiodiversity Research has been collecting information on the ways in which indigenous peoples and rural communities have been using agrobiodiversity to help cope with climate change.

The information comes from over 200 different stories, reports and articles from many different sources that were analysed to identify the most important adaptation strategies adopted. The review led to some recommendations on how agro-biodiversity can be used to help improve the adaptability and resilience of the farming systems managed by rural communities and indigenous peoples around the world.

Three general conclusions can be drawn from this analysis of the different ways in which indigenous and traditional agricultural communities are coping with climate change. Firstly, adapting to climate change has usually involved a range of different actions at all three levels: ecosystem or landscape; farm or agricultural system; and involving both inter- and intra-specific diversity. Secondly, innovation based on both traditional knowledge and new information has been important, and social (e.g. community) cultural and political dimensions have played a key role.

Thirdly, use of traditional crop and livestock species and varieties, with new materials where necessary, has been a common feature. From these follow a number of specific conclusions that can provide a basis for action to

support adaptation by indigenous and traditional agricultural communities. These include:

- The continuous process of innovation required to cope with climate change involves the use of traditional knowledge combined with access to new knowledge.
- Local agro-biodiversity-based solutions create opportunities for the integration of adaptation and protection of indigenous peoples' rights.
- The need to adapt to climate change has often led to the revival of traditional practices and agricultural systems.

The Platform for Agrobiodiversity Research (PAR) has been active in promoting agro-biodiversity research relevant to communities since 2006. It identifies gaps in knowledge, gathers and disseminates innovative local practices, and builds partnerships between farmers, indigenous peoples, communities and research.

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The role of indigenous knowledge in responding to climate change: Local-global perspectives

Kenneth Odero

A review of the role of indigenous knowledge (IK) in understanding the shifting of risks between mitigation and adaptation in the face of climate change in Kenya suggests that incorporation of IK can improve adaptation planning, particularly through the provision of local information, improving the understanding of climate change impacts at local levels, incorporation of community-level goals, creation of appropriate (e.g. gender sensitive)

stakeholder processes, inclusion of community-based adaptation approaches, and integration of human and ecosystem concerns.

Evidence was drawn from a range of management-based systems in Kibwezi, including: tree fodder for livestock system and conservation based agro-forestry system in Embu; high value tree crops system in the coastal humid zones; and soil fertility based agro-forestry system in Maseno. The evidence demonstrates the new thinking on community-led responses recognises IK as the resource most readily available to smallholder farmers, pastoralists, fishing communities and forest dwellers, including indigenous people, to deal with the impacts of climate change.



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Integrating local and indigenous knowledge into river basin management for effective climate change adaptation

Bonty Botumile and Stephanie Midgley

Indigenous and local knowledge (ILK) should play an integral role in building climate resilience. Existing adaptive local practices can be harnessed and tailored to ensure communities are able to reduce their vulnerability to climate change. Across southern Africa, local communities and institutions understand and experience climate variability and climate change differentially, informed by specific social and institutional contexts and histories of engagement with, and reliance on, their environment. ILK must not only be sought and recognised, but also integrated into local and regional knowledge systems and management plans if communities are to engage in effective adaptation and climate resilient development.

This paper focuses on specific case examples from across the Okavango River Basin in southern Africa. Three villages in Botswana were utilised for the primary research; Tubu located on the pan handle, and Toateng and Shorobe, both close to Maun at the bottom end of the Okavango Delta. The use of key informant interviews, focus groups, household surveys and village theatre groups provided a robust basis to illustrate the intrinsic adaptive capacity and resilience that exists and is embedded in indigenous knowledge systems in this part of the Basin.

In addition, the paper presents the potentially important role of

ILK and its custodians in trans-boundary river basin management, in view of identified climate change vulnerabilities. The role of community structures in both informing, and taking guidance from Basin institutions tasked with managing the Basin, is presented. A meeting of the Basin Wide Forum was convened in Namibia in November 2010, and attended by 15 elected community leaders (of 60 members) from the three riparian states sharing the Okavango River.

An apparent partial disconnect regarding the key climate related issues was identified by the three sovereign communities, in relation to the issues commonly discussed in the literature and amongst local and national governments. The paper concludes on the fundamental importance of the understanding and integration of ILK into local, national and regional initiatives to adapt to climate change, within the context of the shared river basin.

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Climate change and adaptation strategies: Lessons from women's indigenous knowledge practices

Annabella Abongwa Ngenwi

Women account for almost 80 per cent of the agricultural sector in Africa. Seventy per cent of the 1.3 billion people in the developing world living below the threshold of poverty are women. Although over the years women have developed various adaptation strategies to cushion the effects of climate change, they are still caught up in the vicious cycle of poverty and increased vulnerability. Future development plans should ensure that the consequences of climate change do not lead women into further deprivation. Indigenous or traditional knowledge has over the years played significant roles in solving problems, including climate change.

This article argues that if climate change policy is about ensuring a sustainable future by combining agricultural development and environment issues, it must learn from and build on the experiences of women. The objective of this study was to identify how the indigenous knowledge of women can be strengthened to better adapt to climate variability and change.

This study reviewed the indigenous knowledge practices of women in agriculture, and synthesised lessons on adaptation strategies and constraints

to adaptation that would guide policy on gender and sustainable agricultural development. Because women are desperately trying to escape poverty they are motivated to be economically active. Lessons can be drawn from specific attributes of indigenous practices which include good social networking and sharing of new ideas, community participation, use of low-cost locally available materials in crop production and storage facilities, crop diversification and biodiversity conservation, caring abilities and the high level of risk awareness. Constraints to effective adaptation are limited financial support, limited involvement in decision-making and religious/cultural barriers.

For effective adaptation to climate change, women need to be supported so as to enable them to become active participants in developing and designing adaptation strategies which will benefit both men and women.

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Preparatory tools for a better understanding of the links between migration and climate

Ahmadou Kanté

African countries south of the Sahara are known for being areas extremely vulnerable with regards to their human and natural systems. The effects of drought on livelihood systems of local communities, coastal erosion and extreme events, such as urban and rural flooding linked to rainfall deregulations, provoke population displacements which are important to understand in order to develop preventative strategies for efficient management. However environmental migration is little, if at all, taken into consideration in national and local planning documents for climate change response.

This presentation discusses the stakes of environmental integration through national and local strategies to reduce vulnerability and strengthen community adaptation capacities. A better understanding of these stakes shows increased interest around the expected impacts of climate change in sub-Saharan Africa, given the important movements of population - particularly immediate internal and/or trans-boundary movement (IPCC).

It is important to put in place mechanisms and tools for local

and scientific knowledge to better understand the complex links between vulnerability, degradation of livelihoods and environmental migration.

The appropriation of these participatory mechanisms and tools by the national and territorial institutions, as well as community-based organisation and NGOs, will increase the chances for success of urgent responses to the challenges presented by climate change in Africa in terms of human security. Another advantage of using participatory tools is that the data collected will serve any development project in terms of incontestable integration of climate change risks in the area of intervention.

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Climate change adaptation practices in sectors of traditional medicine, nutrition and forest exploitation in villages neighbouring Hippopotamus Pond in Western Burkina Faso

Josephine Yameogo

This work was conducted as part of the activities of the UNESCO MAB and the Biosphere Reserve of Hippopotamus Pond in Western Burkina Faso. This reserve is found in the climate of the western Sudan and is vulnerable to climate change. As a result practices of adaptation to the negative impacts are adopted by communities. This study seeks to identify the events linked to climate change; their repercussions on health, nutrition and forests in these villages and the adaptation practices stemming from local and indigenous knowledge of the populations concerned.

Group interviews according to the PAPOLD (Participatory Analysis for Poverty and Livelihoods Dynamics) and individual interviews were conducted with communities from the neighbouring villages Bala, Bossora, Sokorani and Tiérako.

This work revealed that the villages experienced climate phenomenon with significant negative consequences in 1994, 1995 and 1999. Since then, adaptation practices based on local knowledge has been promoted. Traditional medicine is much more solicited in the treatment of 29

diseases, four of which are linked to winds and low temperatures, five of which are linked to winds and high temperatures, eight of which occur during all seasons and 12 childhood diseases. Treatments are based on the use of plants. In order to contribute to food security 26 plant species are used in food preparation. Agro-forestry practices also seek to alleviate problems of wood for energy, embankment, closing of water ways and the disappearance of fruit species.

This local knowledge, confirmed by the physic-chemical properties of plant species contributes to the improvement of rural and urban populations' health, food security and forest resource management.

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Farmer innovations for adaptation to climate vulnerability in the lower Ouémé Valley, Benin

Rivaldo Kpadonou

Climate change has become a major threat to sustainable development. However, even when recognised that poor communities - particularly in sub-Saharan Africa - are more vulnerable, the degree of vulnerability and the responses of local communities depends on the ecological and socio-economic characteristics of each community. This paper also presents some indigenous innovations developed by farmers in the lower valley of Ouémé, faced with a particularly vulnerable climatic context.

Naturally the lower valley is a lakefront which despite its fertility, is almost fully flooded in the rainy season and thus not appropriate for rain-fed agriculture. Despite these hydro-climatic constraints, farmers were able to develop remarkable adaptive capacities over time by practicing a system of agro-fisheries production in the flood plains based on traditional aquaculture practices in the 'whedo' or 'fishing hole' and off-season agriculture.

However, without fully understanding the water resources, agricultural yields were extremely affected by the climatic constraints characterised by early flooding and rapid dry seasons in the plains. Even if these constraints were naturally linked to the hydro-climatic characteristics of the Ouémé lower valley, their frequency and intensity have increased over the past few years, threatening the survival of neighbouring communities.

In this context, the whedo improves, or 'whedo' agro-fisheries and other indigenous water management techniques such as small dikes, constitute major innovations developed by farmers in order to mitigate their climate vulnerability and secure their livelihoods. Faced with increasingly intense climatic events the whedos which were previously dug in the flood plains to trap migratory fish during the flooding, have become areas sought after for off-season farming.

Thus given the success of agriculture in the whedo dikes and the low yields of fish in an increasingly vulnerable agro-climatic context, farmers are beginning to develop small dykes in the flood plains primarily for agricultural production. These various innovations allow them to save crops from water shortages and lower the risk of crop flooding. Promoting these innovations is necessary to strengthen the adaptive capacities of farmers in the context of increasingly intense climate vulnerability given the threat of climate change.

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Information sharing on climate change in the community setting: The LEAD Francophone Africa method

Aliou Sane

This presentation offers concrete examples from our experience in the Adaptation Capacity Building Project for communities and local institutions faced with the impacts of Climate Change (CSCF), initiated by the LEAD Francophone Africa programme in the Bakel region of eastern Senegal.

Targeted communication in the community setting was beyond doubt the most appropriate form of communication, as it allows for contact with the community in all of its diversity. Whether it be by community radio or traditional means of communication, it is necessary to take into account specific socio-cultural realities in order to reach the target group. Urban centres are generally well-covered by mass media, however, rural radio experience shows that there is an enormous rural audience that has been left behind by typical radio productions even though the radio is present in the majority of households. Community radio was found to offer true communication support towards local communities.

The experience cultivated with the Jida FM community radio in Bakel, which covers the entire climate change project area of intervention, supports this principle. The partnership with local media favoured the production of a weekly broadcast entitled '*A Gube y axa a ma joxii*' (in the dominant local language, Soninke), and contributed to posing climate change issues in a collect way within households Bakel. Adaptation through information exchange and awareness groups is

the most essential aspect of the CSCF project's communication strategy. The information and awareness sessions, which are sometimes held using film projections in the rural areas, followed by a debate, are important moments of exchange and sharing between the communities and the project's experts.

Products available to share from this project are: the film 'Where we used to fish, now we grow food', an ecological memoire in images, and a publication from the 'Leading the Way' series.



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Scientific seasonal prediction: What Is the value of traditional knowledge?

Hubert N'Djafa Ouaga

Africa remains one of the continents most vulnerable to climate change (IPCC, 2007). Collective memory still recalls serious droughts in the 70s and 80s in sub-Saharan Africa.

Adaptation represents the only alternative to fight the adverse impacts of climate change. In addition, the scientific community has been developing tools for years, which are able to help in decision-making for the management of agro-pastoral campaigns. Amongst these tools is Seasonal Prediction in West Africa (PREvision Saisonnière en Afrique de l'Ouest – PRESAO).

Farmers themselves have traditional ancestral practices for the seasonal prediction of rainfall handed down from generation to generation. In sub-Saharan Africa, local knowledge guides practices and decision-making for small-scale farmers who represent 70 per cent of agricultural producers and over 60 per cent of the population (Nakashima and Roué, 2002).

Careful to take into consideration local knowledge in the PRESAO process, the AGRHYMET Regional Centre has undertaken a pilot study in the region of Liptako-Ngourma (Burkina Faso, Mali and Niger) to collect and put together a method of interpreting

traditional indicators to predict rains along with climatic and meteorological parameters using statistical-dynamic models.

A database of 97 traditional indicators was created and coded according to type (astral, plant, animal and physical indicators) from which the 16 most relevant and most used indicators were extracted. Observing their behaviour allowed farmers to determine the beginning, quality and end of the rainy season.

This research will be continued in the AfriClimServ project funded by the African Development Bank (AfDB) to validate and integrate the indicators in the PRESAO process

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Special panel on gender and youth

Child rights and climate change adaptation

Frances Seballos and Emily Polack

“ The new ideas that we learnt at the AfricaAdapt Symposium will be used in our research and will be shared in my country.”

Felicien Kabamba Mbambu

Research by Plan Sweden and the Institute of Development Studies highlights the potential for national adaptation planning to be made in the best interests of the child, and how a rights-based perspective on climate change adaptation must transform national adaptation planning.

The children who took part in the research are involved in a programme implemented by Plan International to reduce risk of disasters. At the time of the research, children in Kenya were experiencing their third consecutive year of failed rains. They clearly articulated the links between worsening drought and water resource management and violations of their rights as established under the Convention on the Rights of the Child (CRC).

Children who participated in this study have clear priorities highlighting threats to many of their rights including to development, survival, education, non-discrimination, protection and participation:

- Lack of access to water and irrigation infrastructure threatening their agriculture-based livelihoods, causing a decline in food availability and income.

- Insecure livelihoods requiring them to spend more time farming or generating income and thereby constraining their access to education alongside increased hunger and illness. Physical access to school in times of flood is a further priority concern.
- Insecurity associated with risks of abuse they are exposed to when in search of increasingly scarce food and/or migrating because there is not work where they live and they need to support their families.
- Lack of voice or power to stop further environmental degradation.

Children see how poor natural resource management contributes to violations of their rights by increasing hazards and limiting agricultural productivity, and therefore increasing their vulnerability to climate change.

This research suggests that fulfilling child rights in a changing climate requires a two-track approach: 1) integrating child rights into national climate change responses and; 2) integrating climate change into national child rights agendas.

Primary responsibility for adaptation planning and delivery and for implementation of the Convention

on the Rights of the Child rests with national governments. As the primary duty-bearers, governments have a responsibility to ensure child rights are realised, especially in a changing climate. Civil society organisations and donors have a role in facilitating these processes through engaging in strategic research and awareness-raising and processes aimed at holding governments, donors and private actors to account.

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Participants' messages on young people

1. **Formal and informal education** would ensure that the teaching/training/networking that was offered to young people was useful, attractive and indicated the relevance of climate change across all subjects.
2. **Create an enabling environment for learning** – young people would have their education subsidised, be provided with maintenance grants, be taught in local languages, rewarded for their advocacy and offered apprenticeships/micro finance for low carbon jobs.
3. **Larger decision making roles** for young people in government and development. This would address their marginalisation/abuse in political processes, improve the accountability and transparency of climate change policies and give them a longer term vision of development. Rural youth should benefit especially.
4. **Start from the grassroots** – mainstream the needs of men, women, boys and girls into policy from grassroots, through national to international levels.

Africa Adaptation Programme experiences - gender and climate change : Vulnerabilities and resilience in the face of climate change

Ryan Laddey

The Africa Adaptation Programme (AAP) is a strategic climate change adaptation initiative designed to help create more informed climate change adaptation decision-making and more effective implementation of those decisions in each of the 20 participating countries. An integral dimension of the AAP within the 20 participating countries is mainstreaming gender into climate change adaptation planning and decision-making. On the one hand, women's responsibilities within the household and community (agricultural production, water collection, caring for the sick) make them especially vulnerable to climate change.

This is exacerbated by their lack of decision-making power; access to information and education; and economic and financial opportunities. Women, on the other hand, could play a key role in reducing vulnerabilities and increasing resiliency of natural and human systems because of their knowledge of natural environment and role in the society.

In this paper, these factors increasing women's vulnerability to climate change and the gender dimensions of climate change are discussed further. To promote equitable and gender-sensitive adaptation to climate change, the AAP is actively supporting

countries to integrate gender perspectives into both the design and implementation of their programme activities.

The AAP countries are adopting a broad range of measures to integrate gender within their local context to reduce women's vulnerability to climate change. In this paper, these measures are discussed with examples of gender-sensitive adaptation approaches from many of the AAP countries.



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Gender, food insecurity and climate change amongst pastoral communities: Case studies of Mandera and Turkana in Northern Kenya

Nancy A. Omolo

Climate change impacts will vary among different regions, age, income groups, occupation and gender. People living in poverty are more vulnerable to environmental changes because of lack of entitlements to the elements of adaptive capacity and which are socially differentiated along the lines of age, ethnicity, class, gender and religion.

It is often argued that climate change is gender neutral implying that it affects women and men in the same ways. Yet, in many cases, communities interact with their physical environment in a gender-differentiated way. The livelihood strategies in Mandera and Turkana include: pastoralism (main livestock kept – cattle, sheep, goats, donkeys), crop farming, fishing (mainly in Turkana), weaving (of baskets and mats) and wage employment.

The objectives of this study are: to identify women perceptions and concerns in relation to climate variability and change; to evaluate women's vulnerability to climate variability and change in comparison to men; to identify women's adaptation strategies in comparison to men; and to ascertain constraints and challenges women face in adapting to climate variability and change in northern Kenya.

This study involved undertaking a literature review of secondary data, collecting household quantitative data, focus group discussions (FGD), key informant interviews (KIIs) and compiling and analysing meteorological data on temperature and rainfall.

The quantitative data was coded and entered in the Statistical Package for the Social Science (SPSS) for analysis while the qualitative data was examined thematically in relation to the objectives that frame this research endeavour. The research revealed that the communities have developed coping strategies to deal with climate variability and change.

There is variation in women and men coping strategies. However, the communities are food insecure and the majority of them consider relying on food relief from the government and non government organisations (NGOs) as a major coping strategy.

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Documenting the linkages between population growth, reproductive health, gender and climate change

Philip Otieno

This project is timely since the effects of climate change are getting more catastrophic day-by-day in Kenya and across the world . Floods in western Kenya, on the coast and in parts of the Kenya's north rift, as well as lands slides, prolonged drought, and unpredictable weather patterns, leaves a trail of disaster calling for humanitarian response, making families unable to cope and live a decent life.

These crises are compounded in cases where families are large, particularly when the majority are young children. This is due to evacuation difficulties, the search for assistance and survival means travelling long distances, learning disruptions, trauma, disease outbreak and for women there is also the danger of sexual harassment during these events for example, in temporary settlements such as tents.

The aim of this project was to document the linkages between population growth, reproductive health, gender and climate change adaptation in Kenya and lobby for inclusion of outcomes in policy documents. This was done by a literature review and secondary data analysis focusing on demographic

parameters, climate impacts, adaptation and vulnerability in Kenya. It entails using key word searches on google scholar, the normal google search and library visits.

The documentation of the project aims to show how climate change affects the population, as well as the gender dimensions of the problem and makes recommendations on strategies to secure a healthy population capable of adapting to the effects of climate change.

The results will be used to influence policy by promoting the application of climate change adaptation strategies among humanitarian and public health organisations; convincing them to integrate climate change into their work and lobby for inclusion of the outcomes in policy documents on adaptation.

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Special panel on case studies
from Ethiopia

Adapting to climate change in the water sector: Assessing the effectiveness

Leulseged Yirgu

This sub-LARS (Long-term Action Research Study) has assessed the role of planned adaptation interventions in reducing vulnerability to climate change amongst water-based livelihoods.

The study team carried out an impact and adaptation assessment. The impact assessment documented local perceptions of climate change and collated secondary data on weather patterns and the impact of climate change on the economic and domestic use of water. The adaptation assessment documented local coping strategies to deal with the impact of climate change and assessed the effectiveness of planned adaptation interventions in strengthening local coping strategies.

The study was carried out in four study sites in the Oromia region. Each study site was purposively selected to represent a proxy adaptation intervention, livelihood zone and different wealth groups.

The proxy adaptation interventions studied include:

- Small scale irrigation schemes;
- Rangeland Management;
- Multiple Use Services (MUS);
- The Productive Safety Net Programme (PSNP).

The first two have been prioritised as adaptation interventions in the National Adaptation Programme of Action (NAPA), MUS has been identified as a climate change adaptation (CCA) intervention for the water sector and PSNP, an example of social protection, is also seen as an effective way to enhance the coping capacity of vulnerable communities under the broader adaptation literature.



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Participatory natural resource management with Somali pastoral and agro-pastoral communities: A lasting community led response to climate change

Holly Radice

Pastoral communities have been coping with changing environmental conditions for centuries. However, in recent years changes to their environments – increasing frequency of drought, land fragmentation, and natural resource degradation – have amplified their vulnerability.

Save the Children UK has been working with pastoral communities of the Somali region of Ethiopia to protect their assets and improved community preparedness for nearly twenty years. Natural resource management has surfaced as a main challenge to their livelihoods and capacity to adapt to climate change variability. Since 2009, Save the Children UK has guided communities to examine local natural resource issues and take positive steps to confront them. Using participatory tools, men, women and children mapped, identified and prioritised their local natural resources concerns and needs. Major issues included land degradation from soil erosion and invasive species, deforestation and water access. Through a cash-for-work scheme, communities were able to renovate local environments, reclaim unused and under-utilised land.

The experience has shown that these communities are ready to take immediate action on improving the management of their local natural resources. This can be a powerful tool to address short-term livelihood improvements as well as assist them to adapt to long-term climate change. However, enhancing the innate adaptive capacity of pastoralists will now require more than community-based and community-led interventions; it will also require tailored support from NGOs and donors and essentially, governments that are also responsive to pastoral community needs and concerns while building their capacity to adapt. Communities will also need support to adapt in ways that creates long lasting positive changes.

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“ This symposium has inspired me to further explore definitions of adaptive capacity and how to measure change, including living with risk and uncertainty.”

Fiona Percy –
CARE International,
Kenya

The contribution of urban agriculture to climate change

Fana Abay and Bisrat Alayu

Climate change is affecting livelihoods across the world. Adverse environmental conditions are affecting food production despite the increased demand for food and lower productivity.

Carbon emission from fossil fuel takes the lion's share among the various causes for climate change. Higher population pressure coupled with fast urbanisation is becoming a concern of Africa.

Local food production in urban areas is one of the adaptive mechanisms to mitigate climate change, through minimising green house gases from fossil fuel emission in transporting food and other livelihood items from rural to urban areas. It is also a means for promoting composting from the ever-increasing urban waste and minimises the green house gases emission.

ENDA-Ethiopia has promoted urban agriculture for 10 years in Addis Ababa, the capital of Ethiopia. Its experience and excellence contribute to the development of different techniques and mechanisms that promote local food production to various sections of the urban community. Solid waste management and compost making has been promoted to support urban agriculture in particular and urban livelihood in general.

ENDA-Ethiopia has recognised the potential of urban dwellers in local food production, as well as the local-global community-led responses in mitigating climate change by reducing green house gas emission during the rural-urban food transportation. Local food production can be considered a very participatory mitigating mechanism whereby every urban dweller can practice food production from backyards and/or any existing patch of land, or from wasted materials like plastic containers, tires, ceramic containers etc.

Cutting the distance between dwellers and livelihoods (e.g. food and related items) by closer proximity of the urban dwellers to these items, in order to reduce the green gases emitted during the transportation between the two extremities is a recommended approach for further research and duplication.

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Poverty alleviation and environmental restoration using the clean development mechanism – A case study from Humbo, Ethiopia

Douglas Brown, Paul Dettmann, Tony Rinaudo, Hailu Tefera and Assefa Tofu

Poverty, hunger and demand for agricultural land have driven local communities to overexploit forest resources throughout Ethiopia. Forests surrounding the township of Humbo were largely destroyed by the late 1960s.

In 2004, World Vision Australia and World Vision Ethiopia identified forestry-based carbon sequestration as a potential means to stimulate community development while engaging in environmental restoration. After two years of consultation, planning and negotiations, the Humbo Community-based Natural Regeneration Project began implementation – the Ethiopian organisation's first carbon sequestration initiative.

The Humbo Project assists communities affected by environmental degradation including loss of biodiversity, soil erosion and flooding with an opportunity to benefit from carbon markets while reducing poverty and restoring the local agro-ecosystem. Involving the regeneration of 2,728 ha of degraded native forests, it brings social, economic and ecological benefits – facilitating adaptation to a changing climate and generating temporary certified emissions reductions (tCERs) under the Clean Development Mechanism.

A key feature of the project is facilitating communities to embrace new techniques and take responsibility for large-scale environmental change,

most importantly involving Farmer Managed Natural Regeneration (FMNR). This technique is low-cost, replicable, and provides direct benefits within a short time. Communities were able to harvest fodder and firewood within a year of project initiation and wild fruits and other non-timber forest products within three years.

Farmers are using agro-forestry for both environmental restoration and income generation. Establishment of user rights and local cooperatives has generated community ownership and enthusiasm for this project; empowering the community to more sustainably manage their communal lands.

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Role of gene bank in adaptation to climate change in three sites of Showa region in Ethiopia

Tesema Alganesh

“ After the symposium I will organise meetings with my collaborators to share the information. I will also go on TV and radio and give the information. In addition, I will use what I learnt in my future films.”

Dieudonné Kete –
Cinecom Laroche,
Central African
Republic

Climate change represents a critical threat to food security, especially in Ethiopia where climate variability and instability has been observed. High temperature and low precipitation is severely impacting crop production, even when high yielding improved cultivars are used.

This study aimed to select locally adapted land races from the National Genebank of Ethiopia with the participation of indigenous women farmers, in order to protect the lives and livelihoods of vulnerable women farmers from the adverse effect of climate change.

The study was conducted at three sites of Showa (Ejerie, Cheffie donssa and Koka) with different agro-ecological zones. A total of 200 accessions of (durum wheat and barley) landrace populations and 22 improved varieties were selected using an innovative geographical information system for climate change evaluation at each site. The germplasm were collected from different agro-ecological zones by the Institute of Biodiversity Conservation.

The women farmers' landrace characteristics recorded were: cold tolerant, heat tolerant, plant performance, leaf size, spike length, grain filling, seed plumpness, stem appearance, leaf color, plant height,

spike color and tillering capacity. In addition, the economic importance and market attractiveness of the variants were examined. Preliminary results shows that 95 per cent wheat and 90 per cent barley of the total land race populations selected were favoured, while only a few accessions of the improved variety were selected.

At the lower altitude site in Koka, the women farmers selected 60 per cent wheat and 65 per cent barley out of the total landrace populations. In all sites the purple seeded wheat and the four and six raw barley were preferred. In Koka the early type variants were selected.

The study shows the potential for genebanks, coupled with the indigenous knowledge of farm communities, in providing locally adapted varieties to help women farmers cope with climate change.

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Special panel on innovations in
agriculture and food security

Collaborative change: A communication framework for climate change adaptation and food security

Federica Matteoli

Compelling issues such as climate change and food security require multidisciplinary approaches and multi-stakeholder action in the process of social learning for adaptive livelihoods. This entails an increasing demand for information, knowledge, and participation that places the need for planned communication activities at the centre of development initiatives.

This presentation provides a conceptual framework to participatory communication applied to climate change adaptation and food security. It demonstrates the need to fully integrate communication for development (ComDev) into community-based adaptation approaches. Integration of ComDev will provide the most vulnerable groups with a chance to generate their own coping strategies, thanks to equitable access to knowledge and information, and enhanced local decision-making. ComDev methods and tools are also instrumental to



enhance rural institutions' capacities to support climate change adaptation at the community level.

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Participants' messages on agriculture

1. **Build capacity** - innovation would draw on indigenous knowledge and science with a focus on empowering and addressing the needs of vulnerable producers and consumers in agriculture.
2. **Low carbon agriculture** using renewable energy, lowering emissions from production and benefitting from carbon sequestration payments.
3. **Grow specific agricultural sub-sectors** including drought or flood resistant crops, organics, agroforestry and controlled environments.
4. **Positive equity and poverty reduction outcomes** by putting issues like food security, social protection and risk management ahead of exports and growth.

Climate change adaptation strategies for sustainable food security and development in Africa: Controlled environment agriculture as a viable option

Mobolaji Oluyimika Omobowale



There is little doubt that the consequences of climate change and global warming are already impacting the environment. Unfortunately, the impact of climate change is more pronounced in Africa than in any other continent due to lack of both short and long-term adaptation policies and strategies. If Africa is not able to respond to the changing climate agricultural productivity, which provides a means of livelihood for about 70 per percent of the African population, would suffer devastating effects.

Among these are: reduction in crop yields and agricultural productivity; increased incidences of pest attacks due to an increase in temperature which favours insect growth; reduction in the amount of water available in most parts of Africa; longer drought periods; reduced soil fertility and;

poor livestock productivity. A viable adaptation strategy for enhancing agricultural productivity and preparing farmers for the effects of climate change in Africa is Controlled Environment Agriculture (CEA)/ Greenhouse Engineering, which is a low carbon and climate compatible method of agricultural production. Unlike most other continents Africa lags behind in developing research capabilities, as well as good policy formulation and implementation, for commercial production through CEA.

This is because much agricultural production is based on rain-fed agriculture, while some other African nations depend largely on food aid from developed countries. CEA offers the possibility of multiple harvests of crops in successive cycles as there is no need to wait for certain seasons before cultivation can be done. If the African continent embraced en-mass, the simple technology behind CEA, the population would stand a good chance of being food secure, as well as mitigating the negative effects of climate change on agriculture.

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“ The AfricaAdapt Symposium has been of very high standard. My suggestion would be ‘keep it up!’”

Omobowale Mobolaji
– University of Ibadan, Nigeria

Role of plant health clinics in enhancing adaptive capacity to climate induced plant health problems: Experiences from Kenya

Negussie Efa

Climate change and pests and diseases are among the major challenges threatening the livelihoods of millions of farmers in Africa. Resource poor farmers are the most vulnerable group to the effects of the rapidly changing climate due to their low adaptive capacity.

Climate change influences distribution and trends of pests/diseases, creating new challenges and increased risks to smallholders. The response to these emerging challenges, both by public extension providers and other agencies is often weak and ineffective. Initiatives often tend to focus on a few crops and/or enterprises, and fail to reach the majority of poor farmers. It is difficult to predict what the changes will be, so adaptive capacity is needed to (a) detect new problems quickly and (b) respond effectively.

Currently, most African countries lack effective pest surveillance, early detection and rapid response systems for new or changing pest problems. Plant health clinics, an initiative pioneered by the Global Plant Clinic (GPC) alliance led by CABI, emerged as a response to these gaps. Plant clinics have been run in several countries of Africa, Asia and Latin America to assist farmers with the wide range of problems they face on multiple crops. Plant clinics are run by agronomists or extensionists from local organisations, who receive basic training on field diagnosis to identify common plant health problems.

They operate in public places, accept

any crop problem and are open to all farmers. Promising results led to the initiation of the current scheme in Kenya. As a result, over 20 plant health clinics were established in Kenya in 2010. The aim is to establish an effective plant health system to provide farmers with regular and locally relevant advice on management of plant health problems caused by climate change and other drivers. It also improves vigilance of current and emerging threats of pests and diseases.

Though plant clinics were primarily initiated to provide advisory services, they can also provide an early warning system of the effects of climate change on plant health. Clinic records generate useful information on changing status of insect pests and diseases. The initiative builds capacity at community and national levels – in individuals, in organisations, and in the plant health system as a whole.

This paper presents experiences from Kenya and highlights key processes and preliminary lessons in promoting the plant health system to enhance productivity and reduce farmers' vulnerability to effects of climate change.

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“ The symposium has shown me the importance of understanding indigenous knowledge and existing best practices, not only in climate change adaptation, but also in other aspects of development.”

David Oliver
– Conference participant

Exploring opportunities for enhancing capacities of individuals, institutions and political domains to adapt to climate change in agricultural sector: A case of Tanzania and Malawi

Amos Majule

Smallholder agriculture underpins most rural livelihoods and national economy in Tanzania and Malawi. Agricultural production is frustrated by several factors including climate change and variability (CC&V) which also negatively affect community livelihoods and ecosystems. Tanzania and Malawi NAPAs puts agricultural as the most vulnerable sector to climate change and hence more efforts is required to strengthen adaptation.

A four year research project funded by DFID through IDRC and implemented in Tanzania and Malawi explored and tested different agricultural innovations through an innovation system in combination with other approaches such as sustainable livelihood systems and learning platforms.

In general, CC&V is reported to affect different boundary partners within an agricultural innovation system including farming communities, institutions and organisations. Based on current existing innovation systems, the flow of information and products to the communities could be improved through the project and thus be used as a model.

There is evidence that using the outcome mapping approach, the behaviour of different boundary partners (particularly farmers, extension workers and NGOs, covering political domains of both local and national levels involved in agricultural production in the study area) could be positively changed in terms of

their attitudes through actions to implement and support different adaptation options to CC&V thus reducing vulnerability. For example, demand for appropriate soil and water management practices, such as the use of deep tillage implements, proper fertilizer types and rates, crop processing techniques and other related practices, is evidenced by increasing crop productivities.

Furthermore, policy influence at local government level in most study sites includes supporting adaptation initiatives or farmer research groups by offering appropriate tillage implements, supporting training on production of quality declared seeds, facilitating an irrigation initiative and training non-farmer stakeholders.

For this innovation model to work better in this context it requires collective mobilisation of resources and collaboration of different boundary partners. The AfricaAdapt program should focus more in supporting action-oriented research whereby the information on approaches to strengthen adaptations are shared.

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Special panel on lessons from the
African Climate Change
Fellowship Programme

Climate variability and change or multiple stressors? Farmer perceptions regarding threats to livelihoods in Zimbabwe and Zambia

Chipo Plaxedes Mubaya

Climate variability is set to increase, characterised by extreme conditions in Africa. Southern Africa will likely get drier and experience more extreme weather conditions, particularly droughts and floods.

However, while climate risks are acknowledged to be a serious threat to smallholder farmers' livelihoods, these risks have been considered to be a risk multiplier. It was important for this study to understand farmer perceptions regarding the role of climate risks within a complex and multifarious set of risks to farmers' livelihoods.

This study used both qualitative and quantitative methods to investigate farmers' perceptions regarding threats to livelihoods in southern Zambia and south-western Zimbabwe. The study finds that farmers' perceptions relate more to climate variability than to climate change. While farmers report changes in local climatic conditions consistent with climate variability, there is a problem in assigning contribution of climate change

and variability and other factors to observed negative impacts on the agricultural and socioeconomic system.

Furthermore, while there is a multiplicity of stressors that confront farmers, climate variability and change remain the most critical and exacerbate livelihood insecurity for those farmers with higher levels of vulnerability to these stressors. Essentially, there is need to make a transition from designing policies that target climate change issues as a distinct entity to policies that address climate change issues as an integral component of multiple stressors that confront farmers.

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Flood risk management in diverse contexts: Examples from Nigeria and South Africa

Felix Olorunfemi

There is a growing need to address vulnerabilities to climate change through adaptation efforts. At present, this development has taken place largely in parallel to the increasing shift from disaster management to disaster risk management. Disasters are associated with extreme weather events.

Climate change directly interacts with the exposure to climatic extremes. The challenge in the context of adaptation is to move from the understanding that climate change is occurring, to concrete measures that reduce existing vulnerabilities of human and natural systems.

This study focused on impacts and responses to flood risk among the urban poor living in the highly vulnerable informal settlements in the Cape Flats of the City of Cape Town, South Africa and those living along the Asa River channel in the city of Ilorin, Nigeria. It explores the underlying vulnerabilities of the two areas and the challenging problem of how to effectively shape human institutional responses to the risk of natural disasters with a special focus on floods.

The social risk management (SRM) and asset-based approaches on which the

study is based provide a conceptual framework for understanding the sequential links between risks; human exposure and sensitivity; the impacts of risky events; and risk management (or adaptation) strategies.

The study utilised primary and secondary data. The outcome of the study shows marked differences in the vulnerability factors and the management of flood related disasters in the two study areas. Furthermore, it was revealed that the indigenous coping mechanisms employed by the poor may become less effective as increasingly fragile livelihood systems struggle to withstand disaster shocks.

Strategies to reduce vulnerability should be rooted in vulnerability analysis and greater understanding of both household-level and macro-response options that are available to decrease the poor's exposure to climate risk.

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Comparison of communities' adaptation strategies in Kenya and Central African Republic catchments to droughts and floods

Cyriaque-Rufin Nguimalet

Droughts and floods are hydro-climatic extremes which traditionally agitate the life of the local communities in Africa, particularly in Lake Naivasha (Kenya) and Central African (Tomi, Gribingui and Fafa) catchments. They cover a characteristic today where the threat of the effects of climate change deserves to be reconsidered for controlling these phenomena.

This paper presents and analyses the adaptation strategies to these phenomena taking into account socioeconomic capacity in the studied basin-slopes. Data on adaptation strategies were gathered by questionnaire and interview. The concern was to identify the extreme events most current affecting communities and their activities in both sites and to encircle the respective adaptation mechanisms.

Most surveyed perceived droughts like the major extreme event in Lake Naivasha basin and floods and droughts in Central African basins. The strategies against floods are removal, dams, and searching for relief in Lake Naivasha basin. In the Central African basins they are also removal, as well as using water from drilling for drinking, digging gutters for evacuating/ absorbing water and requesting NGO support. Against droughts, a change

of activity, traditional sinking near the rivers, water purchase, use of water of drilling or going elsewhere, are the collected strategies in the Central African basins.

On the other hand, boreholes construction, food purchase, and the search of relief or water from traditional wells are the suggested strategies of communities in the Lake Naivasha basin. All these strategies, and their close relations from/ to each other, establish a renewal of the traditional strategies and correspond to the socio-cultural and socioeconomic level of local communities, but their average annual incomes varying from USD \$66 to USD \$222 are weak to raise their adaptation capacities.

An improvement will be necessary to harden communities facing the rare phenomena per basin, and would guide a national or transnational adaptation policy

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“ The symposium had a good balance between scientific studies and development projects.”

Denis Sonwa –
CGIAR, Cameroon

The Role of various information sources in climate change adaptation of herdsman and identification of public policies: Case study of the arid region of Kibwezi, Kenya

Sale Abou

Kibwézi county in south-western Kenya is part of the arid regions of Africa where communities are seriously affected by the impacts of climate change. Agro-herdsmen in particular are more impacted given the fragile nature of the resources they utilise. However these communities have developed diverse adaptation strategies from various sources of information.

A study was conducted from May to September 2009, in order to evaluate the contribution of various sources of information to improve community adaptation to climate change.

The methodology criss-crossed all of the primary roads linking the various villages and a questionnaire was submitted to 186 heads of household, with whom we met in their houses each 300 m to 500 m on our path. The statistical programme SPSS, particularly descriptive statistics, and the multi-variate probit model were also used.

The study found that the primary adaptation techniques remain as: the terraces for crops and soil, vaccination and the use of harvest residues for livestock, and the purchase of

pump water. The primary sources of information remain public and private technical services, radio, salespeople for agro-pastoral inputs, NGOs, churches, community associations, family, neighbours, experience and school. Similarly education, technical services, salespeople for inputs and radio has significant influence on adaptation.

The study recommends the Kenyan government strengthen the provision of credit to heads of households to increase their revenues and educate their offspring, increase the technical services, organise the agro-pastoral salespeople and set up rural radio stations, construct dams on the Athi River, and subsidise the purchase of tanks and greenhouses to allow communities to produce in the off-season.

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