Community Champions: Adapting to Climate Challenges

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Community Champions: Adapting to Climate Challenges

Fourth International Conference on Community-Based Adaptation
Dar es Salaam, Tanzania, 2010

Hannah Reid, Saleemul Huq and Laurel Murray

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Preface

The fourth International Conference on Community-Based Adaptation to Climate Change was held on 21-27 February 2010 in Dar es Salaam, Tanzania. Since 2005, the Conference has grown and matured demonstrating that, irrespective of the politics surrounding climate change, real action is taking place on the ground. Roughly 200 participants were in attendance from 35 countries representing government, donors, non-government organisations, community-based organisations and research institutions. The proceedings were punctuated by field trips to community-based adaptation (CBA) projects and activities in Tanzania with a further five days of interactive plenary and technical sessions. The conference also saw the launch of the Global Initiative on Community-Based Adaptation (GICBA): a knowledge-sharing platform for supporting and promoting a stronger voice on CBA issues.

Community-based adaptation is targeted at those most vulnerable to climate change and represents a relatively new approach consisting of community-based development activities, practices, research and policies. It is community-driven and has flourished throughout many vulnerable communities in developing countries, and also some developed countries. That said, CBA is still in adolescence with challenges surrounding knowledge sharing, documentation and scaling up current CBA initiatives. It was in response to these challenges that the annual international conferences on CBA were initiated. Each conference has brought together stakeholders from donor agencies to local NGOs to share their projects and experiences, compare approaches and even challenge one another.

The Conference was structured around plenary and technical sessions on a variety of important subject areas such as agriculture, water resources and ecosystems to cross-cutting issues of policy, funding and strengthening institutions. Nearly a hundred projects were showcased and demonstrate the sheer variety and innovation of current community-based projects. The projects and activity summaries described here will hopefully act as a resource for information sharing and learning.

Laurel Murray - Kings College London
Editor

Introduction

Scientists are clear that climate change is happening, and that those likely to be worst affected are the world's poorest and most marginalised countries and communities. Ironically it is these people who have contributed least to the problem of climate change, because of their very low greenhouse gas emissions, who will suffer most from its consequences.

Poor countries and communities are more vulnerable to climate change because they tend to be located in geographically vulnerable areas, such as flood-prone Mozambique, drought-prone Sudan, or cyclone-prone Bangladesh, and in other vulnerable locations. The slums and informal settlements surrounding many developing country cities are usually sited on land prone to landslips or to flooding and riverbank erosion. Wealthy people, commerce and industry can afford to situate themselves on safer land.

Many poor communities are heavily dependent on natural resources for their livelihoods. Unpredictability in the timing of rainfall makes it more difficult for subsistence farmers to decide when to cultivate, sow and harvest, for example.

Vulnerability to climate change also has social, economic and political dimensions. Poor people rarely have insurance to cover loss of property due to storms or cyclones. They cannot pay for the healthcare required when climate change-induced outbreaks of malaria and other diseases occur. They have few alternative livelihood options when their only cow drowns in a flood or drought kills their maize crop for the year. And they do not have the political clout to ask why their country's early warning system did not prepare them for floods.

Under the United Nations Framework Convention on Climate Change (UNFCCC), industrialised countries have accepted that they have a responsibility to help poor and vulnerable countries to adapt. International climate change negotiations, multilateral and bilateral agencies, donors and international governance and financial institutions such as the World Bank are also paying increasing attention to how best to help people to adapt and making more funding available for this purpose. However, until recently, most efforts to help countries adapt focused on national planning and top-down approaches based on climate change modelling. Remarkably little attention has been paid to the knowledge and experience held by communities themselves on how to cope with a changing climate.

What is community-based adaptation?

Community-based adaptation (CBA) describes an approach to increasing the resilience of some of the world's poorest communities to the impacts of climate change. It should be a community-led process, based on local priorities, needs, knowledge and capacities, which can then empower people to cope with and plan for the impacts of climate change.

In practice, CBA projects look very like 'development as usual' projects and it is difficult to distinguish the additional 'adaptation components'. For example, in a drought year, one cannot divide water storage measures undertaken by local communities into those initiated as a response to 'normal' climate variability, and those initiated as a response to climate change. The difference, however, is that CBA work attempts to factor in the potential impact of climate change on livelihoods and vulnerability to disasters by using local and scientific knowledge of climate change and its likely effects.

Good CBA needs to integrate both scientific and local knowledge into its planning processes. Scientific information includes long-term predictions from climate change models, seasonal forecasts, remote sensing observations and satellite pictures. Local knowledge includes information about trends and changes experienced by communities themselves and strategies these communities have used in the past to cope with similar shocks or gradual climatic changes.

Community-based adaptation is participatory and draws on approaches and methods developed in both disaster risk reduction and community development work, as well as sector-specific approaches such as farmer-led participatory research. It often uses innovative participatory methods

such as community mapping, transect-walks, and participatory theatre or video to help communities analyse the causes and effects of climate change, and to integrate scientific and community knowledge in planning adaptation responses.

The use of genuine participatory processes is important if CBA is to fit with community priorities and build on existing practices or those used in the past. Participatory tools are sometimes used as a way of collecting local information about vulnerability and climate change to be used and analysed by outsiders and it is not uncommon for the priorities and interests of outsiders to override those of communities in any subsequent planning. There is still a lot of 'doing to' communities, rather than communities taking charge but if adaptation is to be effective and sustainable, it must involve and empower communities such that they themselves can make changes. Communities, scientists and development workers need to learn, analyse and plan action in partnership, but communities need to be in the driving seat.

This has wide-reaching implications for professional behaviour and attitudes, and for institutional cultures and structures. Genuine community-based approaches challenge the paradigm where outsiders are viewed as 'teachers' or 'experts' rather than facilitators and students. Participatory processes also need time to develop and flexible funding as they rarely fit with the pre-determined calendars, budgets and outputs demanded by governments and other donors.

Sharing learning on community-based adaptation

The theory and practice of CBA are still in their infancy. Both are growing very rapidly, however, as needs increase as a result of intensifying climate change impacts and as interest in and support for adaptation grows at national and international levels. Funding is increasingly available for adaptation activities, but simply providing poor country governments with more money does not mean that it will reach those who are most vulnerable to climate change, let alone increase their ability to adapt.

Large scale CBA initiatives are now being designed to try and answer some of the questions arising through 'action research'. For example, Global Environment Facility supported projects have been systematically piloted in ten countries since May 2008, and in 2009 the Small Grants Programme launched a Mekong and Asia-Pacific CBA Programme with AusAID support. The United Nations Environment Programme has further plans to scale up financial support for CBA including launching a Global Partnership on CBA involving United Nations agencies and civil society with support from the private sector and foundations. The Climate Change Adaptation in Africa Research and Capacity Development Programme funded by the International Development Research

Centre, Canada, and the Department for International Development, United Kingdom, also funds several CBA projects.

Whilst CBA initiatives are increasing in number, and information sharing on these activities is developing, translating these activities and documentation into improved policy responses and scaled up CBA initiatives worldwide remain a challenge. It was in response to these challenges that the regular international conferences on CBA were initiated. Each conference has brought together representatives from governments, non-government organisations, community-based organisations, United Nations agencies and major donors, and taken them on a two-day field trip to meet communities coping with climate vulnerability and other environmental issues before commencing the hotel-based components of each conference.

At the second CBA workshop, the task was to convince development practitioners working at the CBA level that vulnerability to climatic variability was the entry point for building adaptive capacity. The battle to convince them of the value of CBA is now largely won, and discussions at the third and fourth conferences focused more on topics such as distinguishing CBA from community-based development; how to demonstrate the value of CBA and develop indicators for monitoring and evaluation; scaling up CBA and making it policy-relevant; and, how to integrate climate science into CBA whilst maintaining a community-driven process.

Several CBA projects are now in operation in vulnerable communities in both developing and also some developed countries, and the Fourth International Conference on CBA, which took place in Dar es Salaam, Tanzania, in February 2010, shared experiences from many of these projects. Nearly 200 participants were present. The Global Initiative on Community-Based Adaptation (GICBA) was also formally launched as a knowledge-sharing platform for supporting and promoting a stronger voice on CBA issues.

Remaining challenges

Despite the rapid progress in the development and sharing of knowledge about CBA, many challenges remain. Whilst the number of CBA case studies is proliferating, it will be important to find practical ways to 'scale up' initiatives and to find better ways to draw out and communicate lessons from CBA more widely. Maintaining the balance between community-driven approaches, and more top-down global approaches to CBA, for example under UNFCCC funding streams, will be important, as will ensuring that the importance of local knowledge in emerging initiatives is not second to scientific knowledge. Ways to demonstrate the value of CBA to both development and climate change policy makers are needed, as are the development of effective monitoring and evaluation frameworks that respond to donors' demands whilst also being available to communities so that they can access resources for CBA quickly and efficiently. Lastly, it will be important to acknowledge that a project-based approach to CBA has limitations, particularly where future climate change impacts operate at a scale that cannot be addressed by isolated interventions.

Many initiatives, including the GICBA, the CBA-Exchange, and existing action research projects, are helping to address these challenges. It is hoped that by the time of the Fifth International CBA Conference in Dhaka, Bangladesh, in March 2011, we will see significant progress against these challenges. In anticipation of this, the theme of the fifth conference will be 'Scaling up'.

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Strengthening institutions

Governance of community-based adaptation
by Rachel Berger

When funds begin to flow for adaptation, they will flow to governments. Yet those most affected by climate change are often remote, poor rural communities. Governments do not have a good record of channelling money to their most remote or vulnerable citizens. In addition, it is evident that when most governments think about adaptation, they are considering the need to modify infrastructure, make changes to export agriculture, or provide for additional health risks, rather than supporting vulnerable communities.

There is a demand and a need for oversight of how international adaptation funds are disbursed and spent, to ensure that they achieve the objective of enabling adaptation. This paper draws on Practical Action's work on CBA and on governance in the countries where they are based to outline some key principles for governance of adaptation.

These include national strategies that enable local action as well as participatory planning, implementation and monitoring. These, in turn, included:

(a) community-based planning and implementation

(b) amalgamation of community plans at the district level and,

(c) civil society monitoring and resource disbursement and implementation.

The goal is to ensure that the voices of the most severely affected by climate change are heard and can influence how funds are allocated and spent.

In Nepal, Practical Action has provided training for Village Development Committees to undertake vulnerability and capacity assessments; facilitated census building between groups of villages; and, helped to establish village level needs into district government plans.

Projects in Zimbabwe saw workshops and awareness-raising at the provincial level in techniques of participatory planning. This led to the training and implementation of government staff at the district level to facilitate community-based planning.

Lastly, Practical Action established a capacity building programme in Kenya to cope with the drought in the Eastern Province in 1997-2002. Part of the exit strategy was to build a strong community-based organisation to link with local offices of the Ministries of Livestock and Agriculture. By the spring of 2010, the organisation had grown and is now integrated with a network of over 150 local CBOs on dryland farming livelihood improvement. The high organisational capacity and understanding of technologies and resources strengthen their ability to cope with future climate variability, and offer valuable lessons for community-based adaptation and governance.

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From NAPAs to LAPAs: institutionalising community-based adaptation

by Nanki Kaur, Jessica Ayers, Bimal Regmi & Simon Anderson

Effective adaptation has to be planned and delivered across a range of scales. Recognising this, the Copenhagen adaptation text has included the principle of "subsidiarity", or making decisions and implementing response measures at the most appropriate level. In theory, subsidiarity should be operationalised through decentralised institutional designs that are responsive to local level vulnerability contexts, but also accommodate wider adaptation planning scales.

However, existing institutional designs for adaptation generally focus either at the national level through National Adaptation Programmes of Action (NAPAs), or comprise of community-based adaptation initiatives that have tended to take a projectised approach and are detached from broader climate and development policy contexts. Adding to this, the starting point for planned adaptation tends to be concerned with protecting GDP/economic growth, which is then translated into sectoral adaptation plans; whereas, the starting point for local adaptation is often livelihood security. There is a significant lack of middle-range proposals for adaptation planning and delivery that can meet the requirements of subsidiarity in practice.

There exist a number of planning processes within budget-planning, policy and institutions that can link planned and local adaptation – processes that enable the local to reach up and draw down on planned adaptation. In terms of budgets, local saving schemes have empowered the local level to reach up to planned adaptation processes. For example, in Tanzania it has enabled them to be part of the urban planning process rolled out by the municipality. Within policy, decentralised governance and community-based natural resource management aim specifically at empowering local/subsidiarity. In terms of institutions, there are a number of examples of nested institutions which establish linkages between various scales of planning (programme-related investments (PRIs), federations, farmer's groups) to enable local involvement in planning and implementation.

One proposal for incorporating a CBA-type approach into NAPAs that is currently beingdeveloped in Nepal is the "Local Adaptation Plans of Action" (LAPAs). LAPAs are envisaged as a way of taking CBA a step further by using similar, detailed methods of local-level vulnerability assessments, but with a focus on the institutions at the local level that will play a role in the delivery of NAPAs, thus linking local level planning with national level delivery frameworks.

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Community institutions and advocacy for adaptation policy: a case study from Malawi
by William Chadza

The increasing frequency of climate change related events, such as droughts and floods, has resulted in the least developed countries like Malawi seeing significant growth in climate change adaptation programmes and projects; with most of them being implemented by externally funded environment and natural resources management non-governmental organisations. The development of NGO interest in climate change adaptation has come with an introduction of new institutional and management frameworks which have added responsibilities, and perhaps further confusion, at local community levels.

Amongst the many institutional arrangements introduced are "democratically elected" sectoral committees and NGO-based committees. However, these have often ignored existing informal institutions and traditional leadership. The proliferation and multiplicity of committees challenges the effective implementation of community-based climate change adaptation programmes and projects.

This work by the Centre for Environment Policy and Advocacy seeks to analyse the scope of and constraints upon local level institutional arrangements in general. The project considers how to harmonise existing informal institutions and traditional leadership on one hand, and introduce institutional arrangements for community-based climate change adaptation on the other. In addition, it highlights the experiences of community-based climate change adaptation governance in Malawi. The emphasis is on ensuring effective integration of newly introduced community-based climate change adaptation institutional arrangements, and how to make them accountable to local communities.

Local leaders and institutions still have a principal role in the management of climate change effects

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Networking amongst civil society organisations to enhance climate change adaptation
by Shepard Zvigadza

At times, civil society organisations have not been well organised to tackle climate change challenges; and yet in Southern Africa they act as constructive watchdogs, policy contributors and facilitators in ensuring national governments achieve their commitments, and voice climate impacts. One strong example is the Capacity Strengthening in the Least Developed Countries on Adaptation to Climate Change (CLACC) programme initiated by the International Institute for Environment and Development. CLACC fellows come from all across Africa, covering specifically Southern Africa, East Africa and West Africa; and undertook a range of activities to help organise civil society organisations in the run up to the Copenhagen Summit held in December 2009.

The work by CLACC fellows highlights the practical challenges that face adaptation to climate change. Such work includes the educating of trainers, improved dialogues and other capacity building efforts. They have collaborated with government and civil society organisations; including the agricultural research institutes, key ministries, meteorological services and parliamentarians. The fellows have further participated in the National Adaptation Plan of Actions in their respective countries, shared CBA frameworks for learning, created resource centres, and used climate scenarios and forecasts to better inform about adaptation. The work provides many lessons learned for enhancing civil society networks towards climate change adaptation.

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Lessons from Malawi: the strengths and weaknesses of using voluntary grassroots structures in disaster management

by Robertson Khataza

In the recent past, climate change has had a negative impact on the livelihoods of people, particularly in rural areas. Almost the entire country of Malawi experiences natural disasters, largely in the form of droughts and floods, albeit in different magnitudes. When such disasters strike, it is the poor households that become the most affected due to ill-health, reduced production potential or lack of bargaining power for their traded commodities. Recurrent droughts or floods easily erode development gains and impoverish the rural communities through environmental degradation, food insecurity, disease outbreaks, loss of assets including livestock and social infrastructures, and even the loss of life in the more extreme examples.

The main objective of this project was to assess the strengths and weaknesses in order to draw lessons on the use of grassroots structures in disaster management programmes. This approach scores highly on cost-effectiveness, accountability and sustainability. Community preference or affinity towards incentive-based and remunerative systems tends to diffuse the potential synergy which can be regarded as a necessary ingredient in community-based disaster management. This poses a great threat on the effectiveness and continuity of the programme. There is a need for community awareness and proper understanding of the volunteers if such a system is to continue.

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Management of water resources

Integrating community-based adaptation in water projects across East Africa

by Katharine Cross & Cynthia Awuor

The International Union for Conservation of Nature and CARE International conducted climate change vulnerability assessments for water-focused projects within the Global Water Initiative (GWI) using a combination of climate change adaptation tools, more specifically the Climate Vulnerability and Capacity Analysis (CVCA) Tool and CRiSTAL (Community-Based Risk Screening Tool-Adaptation & Livelihoods). One of the objectives of the Global Water Initiative is to ensure increased resilience to water-related shocks in vulnerable rural communities and their environments. Where they exist, there is the potential to link identified adaptation activities to deliver on the National Adaptation Programmes of Action.

Vulnerability assessments were carried out in Ethiopia, Uganda, Tanzania and Kenya. Community members participated in identifying climatic hazards and their impact, and then defining the appropriate coping strategies. They also brainstormed on alternative coping strategies and the resources needed to put these strategies into place. Facilitators were trained to assist with the collection of data. The trained facilitators then went on to analyse the information in order to assess whether a project is climate proof, and what feasible adaptation approaches could be implemented to reduce the vulnerability of the communities to climate change.

Activities that are outlined in the National Adaptation Programme of Action and then identified through vulnerability assessments can be demonstrated and operationalised at the local level. This can be achieved by piloting successful approaches of managing water resources to improve resilience and promoting learning opportunities to exchange information across scales – from the local to the national level.

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Experiences on climate change adaptation and sustainable development in Zimbabwe
by Felix Mutemachimwe

In developing countries, climate change places insurmountable challenges on small farmers. Without the requisite conservation and food production knowledge and skills, food insecurity will continue to rise, further threatening livelihoods and the socio-economic wellbeing of vulnerable communities.

Zimbabwe has been experiencing recurrent droughts and dry spells. Africare works with communities on technologies that enhance farmers' capacities to cope. Technologies employed include water harvesting techniques such as small water holding ponds, infiltration pits and dead level contours. Working with farmers in the Zvishavane district of Zimbabwe, dry land has been transformed into crop sustaining land. Africare showcases stories about how farmers transformed semi-arid arable land into a microenvironment that supports the production of fruit trees, a wide range of annual crops, vegetables, reeds, swampy area crops (yams), and fish and bird life.

With the increasing unpredictability of rainfall seasonality and variability, Africare promotes the use of drought tolerant varieties of crops such as sweet potatoes and cassava, helping to provide months of food security even during drought years, and adding value through the agro-processing of sunflower, soybean and groundnuts.

Some farmers in the districts of Zvishavane, Shurugwi and Mberengwa have successfully formed a Root and Tuber Association to promote the adoption of drought tolerant crops so as to enhance food security and sustain livelihoods.

Sweet potatoes are drought tolerant; as such the crop has been promoted with good results in ensuring food security.

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Vulnerability and adaptation of Lake Naivasha freshwater ecosystems
by John Nyangena

Lake Naivasha is the only freshwater lake within the Kenya Rift Valley. It supports a large horticultural and floricultural industry, provides geothermal power, and is the site of several hotels and fishing sites; as well as providing direct employment to over twenty thousand people. However, Lake Naivasha has recently witnessed dramatic and predicted threatening changes. Most studies have tended to attribute these to the burgeoning flower industry in the downstream and land use changes in the upstream, whilst ignoring the effects of climate change. This project, using Model for the Assessment of Greenhouse-gas Induced Climate Change A Regional Climate Scenario Generator (MAGICC/SCENGEN) scenarios, assesses the vulnerability of the ecosystem to climate change and adaptation options.

The results demonstrate an increase both in mean annual temperature, ranging between 2-3.5^{O}C; and in mean annual precipitation of 3 percent by 2050. Current vulnerability is manifested in droughts, flash floods and higher evapo-transpiration. These are responsible for shifts in environment and in local livelihoods. Although lake level has receded at an alarming rate, the role of climate change is not easily discernable.

Working in cohort with other anthropogenic environment degradation, it is likely that the lake's ecosystems will change from one dominated by equilibrium species to one dominated by low diversity opportunistic species that would thrive in a variable, unstable and unpredictable climatic regime.

Vulnerability of freshwater ecosystems to climate change is a wake up call to incorporate climate adaptation in the management and conservation of the lake. Key stratgies are: protection and restoration of ecosystem services, strengthening enforcement mechanisms on water allocation, diversification of livelihoods, reduction of non-climate pressures, improved levels of information and knowledge, and implementation of technology-based water-use technologies.

Invasive aquatic macrophyte floating on Lake Naivasha

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Mainstreaming climate change in integrated water resources management: the case of the Pangani River Basin, Tanzania

by Katharine Cross, Emmanuel Mwendera, Alfei Daniels, Excellent HaSylvand Kamugisha, Onesmo Zakaria, John Owino & Hamza Sadiki

The Pangani River Basin Management Project is building climate resilience in the Pangani River Basin in Tanzania by combining social and economic dimensions of development with environmental restoration and management. The interventions include determining sustainable water allocations based on future flow scenarios, establishing water management institutions, assessing the vulnerability of the communities to climate change, and identifying practical adaptation measures. The aim of the project is to enhance the adaptive capacity and improve the resilience of communities in the basin to climate change impacts.

The project uses state-of-the-art climate change modelling combined with an integrated flows assessment, strengthening water governance institutions and community climate change vulnerability assessments to identify and implement adaptation strategies at the local and basin levels. The climate change modelling provides sound scientific evidence for predicting future scenarios in the basin. Both the modelling outputs and flows assessment offer guidance on allocating water within the limits of the river's flow, including allocation of water to sustain natural infrastructure such as wetlands and estuary habitats.

In addition, water governance institutions, such as furrow committees; along with water user associations and sub-basin forums are also being strengthened.

The Pangani River Basin

The outputs from the assessments and modelling are being used to raise awareness amongst water users and transfer knowledge so that water user associations can effectively manage their water resources. Finally, the vulnerability assessment integrates community approaches for adaptation and activities such as supporting the restoration of catchment areas; developing groundwater resources, maintaining and repairing water infrastructure. These approaches are integral components for management plans which integrate maintenance of ecosystem goods and services.

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Adapting to climate change in the water sector: assessing effectiveness of community-based adaptation interventions in eastern Ethiopia

by Nanki Kaur, Million Getnet, Beneberu Shimelis, Zegeye Tesfaye, Gebeyehu Syoum & Endale Atnafu

The RiPPLE programme (Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region) was charged with the goal of assessing the effectiveness of community-based adaptation interventions in reducing vulnerability to climate variability and change in water-based livelihoods.

When viewing household coping strategies, wealthier groups are those more able to rely on supply side strategies; while the poor tend to resort to demand side strategies. Amongst CBA projects, the work showed that small-scale irrigation, if equitable access is assured and if based on ground water sources, can create and enhance the asset base of communities, as well as build their capacity to cope with and reduce exposure to climate change. Improved rangeland management, introduction of improved fodder species and development of water points which are based on strong customary institution consultations are also found to be crucial.

In addition, the effective Productive Safety Net Programmes used social protection aimed to improve food security for the chronically poor, market stimulation, and environmental rehabilitation. Measures included: supply side interventions such as micro basin and community pond construction; demand side investments including afforestation and soil and moisture conservation; and the creation of local institutions like water management institutions. Lastly, the programme provided wage/food labour and access to credit schemes.

Drinking water shortage in one of the study sites.

The study also found that Multiple Water Use (MUS) requires basing such projects on ground water in combination with natural resource management works which enhance local recharge. The major challenges encountered were: maintaining water supply under extreme weather events, such as droughts; and also coordination amongst stakeholders. To ensure effective community-based adaptation, MUS requires inter-sectoral integration and buy-in from all stakeholders; a coordinated management system; and, the organisation and training of beneficiaries and stakeholders. Planning under MUS must focus on both the assessment of available water resources, and investment in water resource management in order to enhance the availability of water.

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Developing early warning ground water monitoring systems
by Bettina Koelle & Shannon Parring

In South Africa, small-scale farmers in Suid Bokkeveld are farming in harsh environments in which people's livelihoods depend upon livestock, rooibos tea and subsistence farming. With rainfall mainly in winter and frequent droughts experienced over consecutive years, farmers identified the local water sector as a priority area to respond to extreme weather conditions and to increase resilience to climate change. Water is a key resource for livestock and subsistence farming as well as for household use. This affects especially the most vulnerable in the community.

With support from Indigo Development & Change, the farmers established a monitoring system to record the levels of boreholes and water quality of fountains. Close collaboration with scientists on this matter was key to exploring local aquifers, to increase the understanding of groundwater resources and the processes that enhance ground water accumulation.

The project aims to set up an early warning system that will inform the farmers of dropping borehole levels, allowing them to develop appropriate strategies and then apply them before the water crisis becomes acute. Water monitors across the area are also monitoring water quality of fountains to detect any changes.

While the process of monitoring is an important one, the learning process has been key to increased adaptive capacity: not by developing a technical solution, but by strengthening networks and the problem solving capacity of the farmers themselves.

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Climate change and its impacts on water resources in Malawi
by Oswald K. Mwamsamali

Malawi is a signatory to the United Nations Convention on Climate Change, which was ratified in 1994. The UNFCCC recognises that "economic and social development and poverty eradication are overriding priorities of developing countries" in the fight against climate change and climate variability. The vulnerability of Malawi to climate change and climate variability stems from the global influence on its rainfall bearing and weather influencing systems. For instance, the inter-tropical convergence zone greatly influences the rainfall receipt in the country and hence the type of climate experienced.

Malawi is already experiencing climate change and climate variability as seen from frequent floods and droughts. The 1992 drought, for example, caused widespread water scarcity which forced the Government, with donor assistance, to embark on the construction of emergency boreholes. Water utility companies also embarked on water rationing and the Electricity Supply Corporation of Malawi (ESCOM) started load shedding as production capacity fell from roughly 240 MW to nearly 80MW. This was due to low lake levels causing a knock-on effect upon the Shire River levels, and hence leading to intermittent power supplies.

There are, therefore, strong calls for an expedited implementation of adaptation measures to mitigate the suffering of the communities from the effects of climate change and climate variability.

Strategies include:

- Borehole drilling, especially deeper boreholes to withstand the effects of climate change in drought prone areas.
- Gravity-fed water supply schemes, some of which are designed with large built in water storage facilities.
- Construction of small, medium and large dams.
- Flood Forecasting and Warning Systems (FFWS), as seen for the Lower Shire valley. The last of these needs urgent attention as existing flood and drought forecasting and warning systems are not equipped to issue real time warnings.

Strategies for future action:

- Emergency works for immediate restoration of water and environmental security for the most vulnerable areas.
- Water conservation programmes that develop water infrastructure and facilities to take care of medium to long-term adaptation needs.
- Improved water demand management strategies that develop management schemes and services to support planning, development, operation and maintenance of the water resources infrastructure in a bid to adapt to climate change and variation.

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Building adaptive capacity

LITETA: Community adaptation in the Chibombo district, Zambia
by Vincent Ziba

The LITETA (Local Initiative: Training for Enterprise, Transformation & Agriculture) Project was founded in the central province of Zambia, 61km north of Lusaka. The district has three constituencies: Kembe, Chisamba and Liteta. According to the head-count undertaken by the Ministry of Health, the population stands at 304,000 due to the movement of people from Lusaka and other areas. Zambia is witnessing a changing climate as the rainfall months are becoming shorter, with flash floods and droughts in some areas becoming more frequent. In the Chibombo District there are poor land management practices which result in land degradation with a high population growth that has led to negative trends; farmers in the area practice a subsistence single season mono-crop (maize) food production system which is affected by the unpredictable rainfall pattern.

This project incorporates various initiatives, the first the Traditional Leaders' Workshop that facilitated the formation of the natural resource management committees to work together with local authorities in order to curb the devastating charcoal burning practice in the area. An awareness campaign on environmental degradation was also launched, carried out by the project staff and the natural resources management committee. In addition, 750 farmers were trained in compost production, fertility trenches, and the use of animal manure, green maturing and soil fertility enriching crops to encourage more sustainable farming technologies. There has been a complete transition from shifting cultivation to permanent conservation farming practices through crop rotation. Small livestock were promoted in areas where chemical fertilisers were used, and tree planting was promoted in the community to replace the trees that have been cut due to charcoal burning and shifting cultivation. Tree nurseries were introduced in most of the zones to replace the ones that have been cut. Natural regeneration and tree replanting is done by the farmers club and the natural resource management committees that are in place.

Community Resource Planning

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Enabling climate adaptation: from information to network building and knowledge integration

by Anna Taylor, Sukaina Bharwani & Basra Ali

There is a wide variety of data, information and knowledge that is relevant to making adaptation decisions in a given context: the location, scale, set of actors, physical environment, policy environment etc. This might include data on climate observations, knowledge about local development priorities, information on the distribution of impacts caused by a certain climate hazard, knowledge of downscaled climate scenarios, data on existing coping and adaptation strategies, information on disaster risk management policy instruments, knowledge about how to access adaptation funding, and many others. The reality is that many individuals, organisations and communities of practice hold different 'subsets' of this existing data, information and knowledge, and have differential access to that which they do not hold. This is partly to do with the medium through which it can be, and is, disseminated or communicated; the motivation to engage with it; and, the skills and expertise needed to use it in order to address climate risks and vulnerabilities, whether this be by modifying livelihood strategies, developing new policy measures, designing projects, making funding decisions, raising public awareness, etc.

This is investigated within the context of Kenya, where knowledge network mapping exercises were conducted with various governmental, non-government organisations (NGOs), community-based organisations (CBOs), research, donor, private sector and media actors working on climate adaptation to identify the current scope of information access and sharing. The network analysis revealed that NGOs were considered an important bridging group, for example facilitating information flows between CBOs and research organisations. However, there are weaker links between CBOs and the two most 'influential' groups – donors and the media – leading to a perceived lack of knowledge regarding ongoing work 'on the ground', thought to be resulting in mismatched priorities and inappropriate funding decisions.

This work tests the potential use of Google Earth to enhance access to, and the communication of, information from various sources relevant to climate adaptation. It links perceptions of risk and adaptation strategies on the ground with the best available climate and impacts science in an 'adaptation story'; whilst also considering the impacts and potential solutions for those with limited internet access. Recognising the power of such a technology, this project builds the tools needed to streamline the process of inputting, finding and selecting the set of relevant information for the user; supporting the growth of the socio-institutional networks fundamental to generating and sharing information; and, generally integrating knowledge.

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Promoting adaptive capacity of pastoralists through inclusive and participatory planning approaches
by Abdirahman Ahmed

Changes in climate pose a dire threat to the lives and livelihoods of pastoralists around world. The frequency of drought, famine, resource-based conflict, animal and human disease, and dependency on food aid has dramatically increased in the last decades. Pastoralists are never passive recipients of what fate climate change may dictate, rather they survive and thrive in some of the harshest landscapes of the world. However, their inherent adaptive capacity to climate change has been insufficiently accounted for and addressed in development programming.

The Ogaden Welfare and Development Association (OWDA) was established in 1999 with the mandate to eradicate poverty amongst the most vulnerable pastoralists in the Somali region. The work supports the adaptive capacity of pastoralists to enable them to withstand the natural and man-made shocks affecting their lives, with an emphasis on livelihood support projects, health, education, women empowerment and community capacity building. The Adadle Community Development Project was established to address these needs and has since improved the technical skills and involvement capacity of Woreda Pastoral Development Committees and Kabale Pastoral Development Committees.

This work has sought to mainstream adaptive capacity through inclusive and participatory approaches, bringing together the grassroot pastoral community, Kabale and district authorities in order to co-plan and take responsibility for their local development initiatives. The technical skills of the local administration in planning and implementation capacity have been further enhanced. The provision of a community development fund for the action plans developed by the committees was created; and wider linkages and networks were established.

Mobility as a traditional coping mechanism

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Building local adaptive capacity in the Pacific
by Pelenise Alofa Maike Pilitati

Low-lying Pacific nations such as Tuvalu, Fiji, Tonga and Kiribati will be amongst the first to face the impact of climate change and rising sea levels. The urgency for action through mitigation and adaptation is a call from Kiribati and from the 1000+ most vulnerable Pacific low lying islands which are affected by climate change. Climate change is a threat to the culture, livelihoods, health, food, water, resources and security of the inhabitants. It is a threat to life itself.

Kiribati President, Anote Tong (Vanuatu meeting, 2010), stated that he does not accept migration (or relocation) as a first response for Kiribati. He did, however, recognise that he wanted to see his citizens skilled or trained if relocation were indeed a last resort. One of the goals of the non-government organisation, the Kiribati Global Warming and Climate Change Action Group (KGWCCAG), affiliated to the Pacific Calling Partnership based in Sydney, Australia, is to support labour mobility and to ensure orderly migration. The KGWCCAG began its adaptation programmes in 2008 for up-scaling and building capacities on Kiribati, with a focus on improving literacy and health/food education. Furthermore, it has started its research on village stays, water harvesting and land use (agriculture), recycling of wastes, raised portable communities, creating extended reef systems, and the restoration of Banaba – the highest island in Kiribati.

The challenge is to maintain the momentum of programmes in Kiribati with a commitment to improved human resources, funds, and a strong local and international network.

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Climate change and community adaptation strategies in semi-arid regions of Nyeri and Laikipia districts, Kenya

by P.N. Macharia, J.K. Lugadiru, S. Wakori & E.G. Thuranira

A recent study conducted in the semi-arid regions of Kieni and Lamuria Divisions in Nyeri and Laikipia Districts, respectively, revealed that 100 percent of the farmers were aware of climate change and its impacts. About 61 percent believe that the effects of climate change have become noticeable in the last 10 years. Climate change was attributed to tree cutting and general environmental destruction by the communities for short-term economic gains, which led to unsustainable utilization of resources. The main indicators of climate change were: increased failure of the rains leading to increased droughts, scarcity of water, changes in rainfall patterns, and temperature extremes. However, other manifestations were an increased volume of pests (centipedes, millipedes and birds), and the disappearance of biodiversity (wild animals and insects such as safari ants). The result has been food insecurity and hunger due to unsuccessful harvests, poverty, water conflicts, and lack of pastures for livestock.

Due to not only a scarcity of resources, but also the first-hand experiences of the impacts of climate change, the communities have now realised the need to adopt both community and individual adaptation strategies towards food security and conservation of the environment. The biggest efforts have been towards tree planting and husbandry, especially by the communities living far away from natural forests. Other activities have been to attend capacity building sessions, environmental rehabilitation, water harvesting (run-off and roof catchment), adoption of appropriate technologies and farming methods, and community mobilization.

The lack of pastures has led to a tendency to reduce cattle numbers in favour of sheep, goats, chickens and rabbits. This is due to them being simple to manage, as well as easy sources of meat, milk and revenue. There has also been an increased emphasis on youth involvement, thus preparing the next generation through training measures, as well as participation in community-based activities. However, in order to increase their resilience and effectively contribute to mitigation against climate change, the communities feel they need the support of government and non-government organisations through capacity building, appropriate technologies, enforcement of environmental laws and policies, and financial resources.

Youths involved in the community capacity building session grafting fruit trees

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The role of insurance and microfinance

Weather index insurance and community-based adaptation in Ethiopia

by Mengesha Gebremichael & Yohannes Gebremeskel

The Horn of Africa Risk Transfer for Adaptation (HARITA) pilot project brings together subsistence farmers, non-government organisations, academics, government and the private sector to explore an innovative approach to community-based climate change adaptation in Ethiopia. Over the last two years, the HARITA project partners have worked on designing a climate risk management package for smallholders in Ethiopia's northernmost state of Tigray. HARITA aims to foster holistic, community-based adaptation in a replicable and scalable approach.

The project has broken new ground in the field of climate change adaptation and micro-insurance by addressing the needs of poor farmers through an unusual mix of disaster risk reduction, micro-insurance and credit.

The Weather Index Insurance can:

- Provide a basic tool for risk management
- Reinforce the incentives for farmers to engage in production management decisions
- Prevent the erosion of productive assets
- Reduce the need for emergency food aid
- Help farmers to take more risks in order to increase their returns by investing in drought mitigation activities
- Provide more fertiliser and improved seeds
- Enhance the saving practice of farmers.

The project has established a growing awareness amongst farmers as to the benefits of insurance, to the extent that they are starting to request diversified insurance services, in some cases for livestock and fruit. The programme is suitable for participation of women as household heads. The project also facilitates the work of microfinance through reducing the credit default.

Awareness raising events to help farmers make free but informed decisions

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Weather risk insurance for agriculture
by Satya Priya

Development of weather risk insurance capabilities for agriculture is perhaps one of the most sustainable market-based adaptation approaches in the context of climate change.

This work covers weather risk insurance in four key steps:

1. Identify significant exposure of an agricultural grower/producer to weather
2. Quantify the impact of adverse weather on their revenues.
3. Structure a contract that pays out when adverse weather occurs.
4. Execution of contract.

An analysis was made of the regions at risk from weather and the weather stations that reflect the risks over a period of time. It also identifies the weather index providing the best proxy for exposure to weather.

The work continued by including the scale and resolution of actual data observation points on which insurance products are created; demonstrating how weather variables impact the robustness of an insurance product.

Finally, in order to illustrate the structure of the insurance contract, a weather index is developed using a combination of measurable weather variables including temperature and rainfall. Specific crop weather variables that influence crop yield and production will be illustrated. Other discussion points will reflect if weather is insurable, and if insurance is a viable method for adaptation.

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Community-based adaptation of farmers in the Philippines

by Maria Rebecca A. Campos

About five million small farmers in the Philippines now suffer the effects of climate change. This study describes their demographic and socio-economic characteristics, and compares them to the average Filipino citizen. The production and profitability of farming corn, rice, bananas, sugarcane and tomatoes has been affected by climate change; with losses resulting from typhoons, floods, droughts, El Niño-Southern Oscillation, pests and diseases. Although farmers have natural adaptation practices in place prior to, during, and after these natural calamities, they still need assistance from institutions in order to cope with the impacts of climate change.

The Bridge Financing Scheme can be an effective and efficient instrument to enable them to carry on their livelihood activities, support their families' basic needs, and slowly recover from their losses. At present, about half a million farmers are dependent on the Department of Agriculture for loans to fund their farming operations. Their repayment rate was at about 90 percent. But with the occurrence of natural calamities, farmers can neither pay nor renew their loans. The proposed Bridge Financing Scheme will enable them to continue their farming activities so that the welfare of the entire household is not jeopardised.

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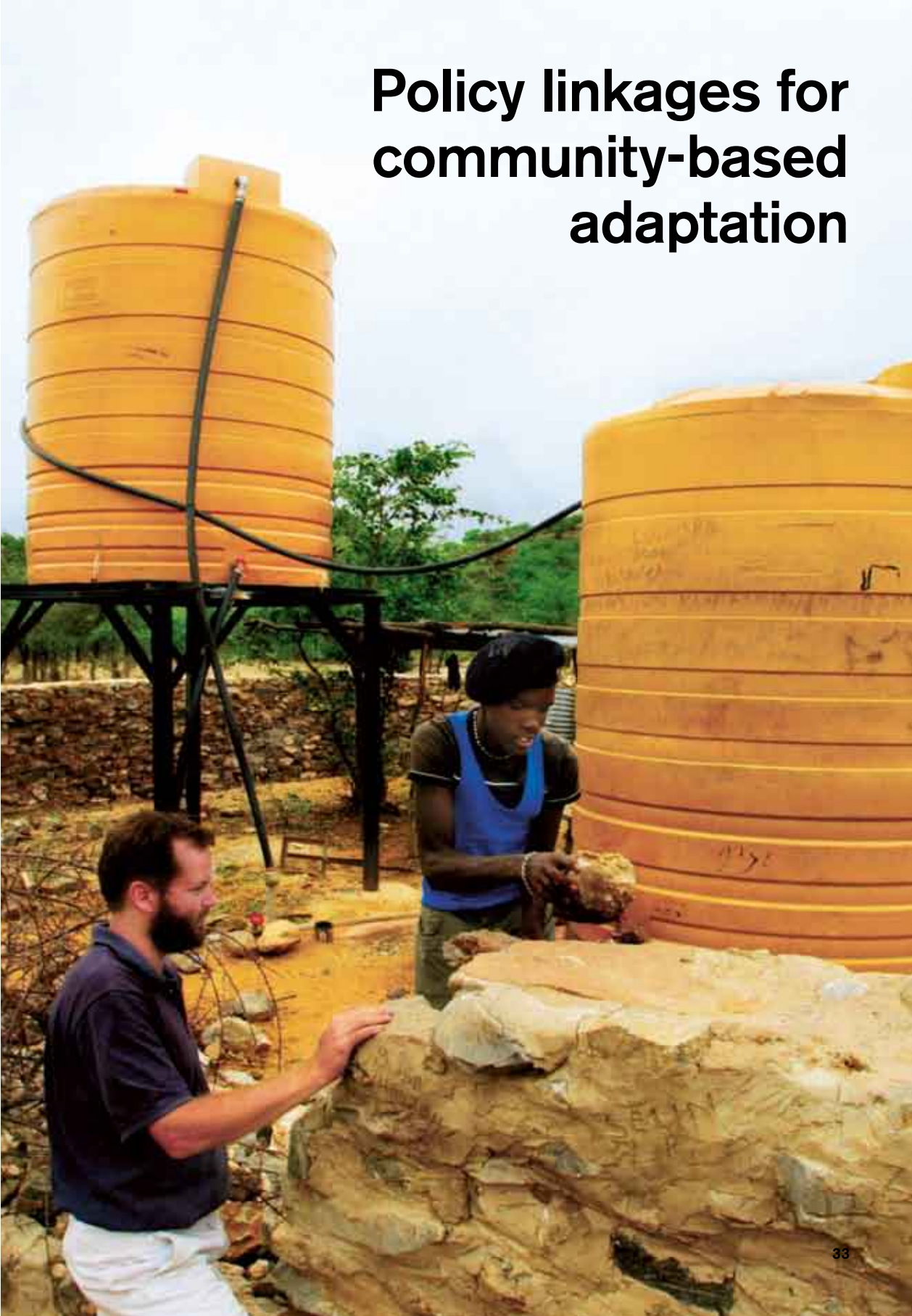
Policy linkages for community-based adaptation



Community governance in mainstreaming adaptation in local development: experiences from South Asia

by P.M.D. Ranga N. Pallawala

South Asia is recognised as a "disaster hot-spot" as a result of climate change. Severe impacts of climate change have made the lives and livelihoods of millions of poor and marginalised people in the region extremely vulnerable. However, the local governance structures existing in the region are not promoting active and meaningful participation of poor and marginalised communities in development decision-making processes.

Community governance is the process in which the community is the main stakeholder in planning and decision-making processes, and has been tested over the last ten years throughout 86 poverty-stricken villages in Sri Lanka and 326 villages in the State of Orissa in India. Even though the pilot programmes have not considered climate change either as a main or a cross cutting issue, as the evaluations of the programmes reveal, the community governance system has contributed towards climate change adaptation. The post-programme analysis of community change adaptive capacity indicators show that all the activities have directly contributed towards building adaptive capacities of communities.

The experience shows that the potential to adopt a community governance concept for local level development in South Asia is very high. Community-led governance mechanisms can be used as a tool to mainstream climate change adaptation in local development that could ultimately lead to poverty reduction. Furthermore, the community governance process can confront the challenges of a rapidly changing climate and its increasing unpredictability.

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A call for robust policy environments to reduce disaster risks and ensure sustainable adaptation in the Hindu Kush, Himalayan region

by Mats Eriksson, Julie Dekens, Lisa Schipper & Tighe Geoghegan

The Hindu Kush in the Himalayan region is marked by a profound variation in access to water between wet and dry seasons. This seasonal fluctuation not only creates a hazardous environment of either flooding or droughts; but it also complicates the issue of water availability and distribution within societies. This situation is not new. The region has always faced either an excess or a deficiency of water, and people have adapted out of necessity. It could therefore be assumed that adaptation practices in this environment, as developed over generations, will be beneficial in the process of adaptation to increasing climate related stress.

However, five case studies in the region show that this is not always the case. Although the studies illustrate many creative responses to water stress and hazards, they also highlight the need to be aligned with other drivers of change if they are to reduce the risk of disasters and become sustainable. The effectiveness of these responses is influenced by the development context in which people live, which therefore needs to be better understood. For example, changes in population density, infrastructure, market access, national policies and institutions all have an influence on people's adaptation capacity, for better or worse. Simultaneously, climate change increases uncertainty in terms of when, where, and to what degree and force water will become available next time.

This uncertainty calls for increasing action by government and other policy forming agencies to ensure robust policy environments in which local spontanous adaptation efforts to water-induced disasters are supported, thereby leading to increased community resilience.

Jikhu Khola, Koshi Basin, Nepal

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Looking forward: implementing a national strategy for ecosystem-based climate change adaptation in the Marshall Islands

by Albon Ishoda & James Hardcastle

Ecosystem-based adaptation activities by community land-owners in the Namdrik atoll chain include shoreline vegetation restoration for erosion control and water-lens protection, pest control, changes in agricultural practice, and protection for key ecosystems. These activities provide a demonstration for a national strategy on community engagement for ecosystem-based adaptation, called 'Reimaanlok' (Way Forward). Designed to provide guidance for a range of government and civil society partners to engage outer island communities, the Reimaanlok adds a 'climate lens' to a series of steps in participatory community development planning, to identify adaptation strategies at the local level, in the Marshallese context.

The Reimaanlok strategy places remote island communities and ecosystems at the heart of national climate change strategies. It builds on the 'Micronesia Challenge' commitment made in 2006, which provides strong political will for effective management of ecosystem services.

The work on Namdrik highlights the ability of government and civil society to begin to respond to climate change on outer atolls. However, expectations are high. There is a significant investment cost in community engagement, and there is limited capacity to respond to all community requests for assistance. That said, the endogenous capacity of many atoll communities to engage in adaptation activities is remarkably robust.

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Agricultural practice and management

Agricultural Services Support Programme and Agricultural Sector Development Programme in Zanzibar

by Seif A. Seif & Khalfan M. Saleh

It is now widely accepted that climate change will affect agriculture in a range of ways; for example, as a result of reduced frequency and intensity of rains, increased hot and dry seasons, changes in the distribution of vector-borne diseases, and effects on the risks of disasters and malnutrition. The overall balance of effects in agriculture is likely to be negative, and farming communities in low-income countries like Tanzania are particularly vulnerable.

Adaptation to climate change requires special strategies by the farmers and government as a whole. The Agricultural Services Support Programme and the Agricultural Sector Development Programme-Livestock (ASSP/ASDP-L) Zanzibar, Tanzania, was implemented in nine rural districts in Zanzibar to confront issues of sustainable natural resource management and adaptation at the community level. The programmes were based on empowerment; improved skills and technologies through a Farmer Field School approach; the support of research institutions and associated activities; and, facilitating a policy dialogue to progress the legal and regulatory framework.

Focusing on the communities, the programme sought to enhance technology transfer with improved crop and livestock diversification; the use of organic fertilisers; soil and water conservation; disease and pest control; and, irrigation. The Participatory Action Research conducted by Farmer Field Schools specialised on cassava and has assisted farmers to adopt changes in their cultivation by selecting high yielding, heat tolerant and quick maturity varieties of Mwari and Sepideh, which are now considered to be the most successful cassava varieties.

Measuring weight per stem

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Climate change and food security in Maradi District, Niger

by Moussa Na Abou Mamouda

In the Maradi District, farmers practicing rainfed agriculture make up 75 percent of the population. However, because of climate variability and changes, either rainfall has become uncertain, or the seasons are becoming shorter and annual temperatures more extreme. This has resulted in food production decreasing every year despite best efforts. After a rainy season, the harvested food is only sufficient to cover all households' food needs for about three months. Irrigation has become less productive because of water scarcity and higher minimum annual temperatures. The only river (Goulbi) flowing across Maradi City used to flow for at least six months after the raining season, but now only flows for one to two months because of a dam set upstream in Nigeria. The combination of all these factors makes Maradi District frequently exposed to food insecurity.

In case of bad food production led, inter alia, by scarce rainfall as a result of climatic variability and changes, communities tend to implement several coping mechanisms to ensure their food security. These mechanisms include the sale of animals and crafts at the household level; the search for and purchase of food, particularly from inter-community or State cerealbanks; temporary migration to neighboring countries to conduct income-generating activities, and make remittances in advance of the following rainy season; or even permanent migration over longer distances to places in which work opportunities are available, either on a legitimate or clandestine basis.

The Environment and Development Action in the Third World (ENDA) is committed to fighting food insecurity in Maradi, building a sustainable partnership and working closely with local communities in a participatory manner. Our basic principle is that communities who have been living there for centuries have experienced many climate related hazards and changes, and have more or less survived thus far. Partnering with these communities and building upon local knowledge and best practices to reduce food insecurity in Maradi is vital to ensure the total involvement and empowerment of local actors, as well as fostering their trust and ownership. In Maradi District, irrigation can still be a possible adaptation strategy to complement rainfed agriculture. However, due to the fact that the water is coming from another country, Nigeria, there is a need to encourage decision makers from both Niger and Nigeria to talk to each other and work out shared transboundary efficient water use. Support should be given to sustainable coping mechanisms already in place in communities such as food banks, diversification of income-generating activities, and mobilisation of social capital (solidarity, networking, etc.).

This study has uncovered many lessons. Firstly, the root cause of migration is grounded in the unreliable conditions of local livelihoods, as recent surveys have shown that people may not have migrated if there were locally available opportunities. People migrate temporarily from the Maradi District towards neighbouring West African countries.

Partnering with these communities and building on local knowledge and best practices to reduce food insecurity in Maradi is a key to ensure total involvement, empowerment, and fostering trust and ownership from local actors

Owing to permanent climatic changes, they tend to move and settle permanently in countries like Nigeria, Ivory Coast or Libya. Those who migrate to Libya tend to reach European countries, legally or not.

There were also lessons learned about action over research. Local communities are now implementing new approaches and ways of doing action research by either NGOs or other development agencies.

ENDA also saw that implementation of adaptation and other coping strategies by communities are often of very low cost. Overall, the study demonstrates that adaptation to climate change should no longer be considered only as a local but as a multi-level, multi-scale process. For example, the construction of a dam at Jibya, upstream on the Goulbi River which flows from Nigeria to Maradi District in Niger, means that irrigation using the Goulbi River water as an adaptation system in Maradi requires cooperation and dialogue between decision makers both in Niger and Nigeria.

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Sharing lessons from the use of different types of organic manure in Malawi
by Mahara Nyirenda

Malawi has experienced the effects of climate change in a dramatic sense, with droughts and floods becoming increasingly common. These have had a remarkable effect on the landlocked and agriculturally-based nation.

The effects of climate change have been exacerbated by agricultural practices that promote the use of inorganic farm inputs since the country's independence in 1964, and are due to several factors including the uncontrolled felling of trees. These have left the land bare and soils completely degraded for substantial agricultural production without external use of farm inputs.

The government has already started looking at alternatives for ensuring access to farm inputs by targeting smallholder farmers (85 percent of country's farmers with a weak resource base) by introducing the Subsidised Farm Input Programme. This is not only sustainable and reliable, as governments change, but it also targets specific crops.

FAIR has been working in Malawi since 2001 to implement sustainable environmental technologies, such as the use of organic manure. The use of manure has been promoted through trials and on-farm demonstrations.

The results have been positive and have in turn led to increased adoption by many farmers from within and outside the work areas. Among the advantages are that materials for making manure are readily available and affordable but also crops applied with manure withstand moisture stress better than those applied with inorganic farm inputs. FAIR will share both lessons and success stories from the use of different types of organic manures.

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Vulnerability assessment of rainfed agriculture to climate change and variability: biophysical and socio-economic analysis in semi-arid regions of Tanzania

by H. J. Mongi, A. E. Majule & J. G. Lyimo

A vulnerability assessment of rainfed agriculture to climate change and variability in semi-arid parts of Tabora Region in Tanzania was conducted. Four village clusters were selected, three forming the Millennium Villages Project (MVP) in Uyui District; and the fourth in the Tabora urban district. The villages selected were Mbola, Mpenge and Isila from Uyui District; and Tumbi from Tabora urban. Both secondary and primary data on temperature, rainfall and dry spells were collected using structured interviews, focus group discussions, documentary reviews and field observations. Structured interviews were administered to a randomly selected seven percent of all farmers and to 30 research and extension officers obtained through accidental purposeful sampling. Simple regression and t-test analyses of numeric data for rainfall and temperature collected over the last 35 growing seasons were performed. Non-numeric data was coded, summarised and analysed.

While distribution of rainfall declined both in time and space, inter-seasonal dry spells between January and February appeared to increase both in duration and frequency. Increase in temperature was highly significant; however, the minimum temperature was seen to increase much faster than the maximum. Farmers and research and extension officers also perceived these changes with the help of a series of indicators. Nevertheless, perception on the climate change indicators varied depending on the type of livelihood activity most affected.

Major implications on rainfed agriculture include possible shrinking of the growing season, increasing moisture and heat stress for common food and cash crops, increased insects and disease pests and eventually low income and food security.

This research concludes that there is strong evidence demonstrating the vulnerability of rainfed agriculture to negative impacts of climate change and variation in the study area. Recommendations include a need for multi-level interventions on adaptation to climate change and variability taking into account a wide range of stakeholders' involvement.

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Climate change adaptation: empowering local communities in Ayuom, Ghana

by E. Yeboah, P. Ofori, J.W. Six & B. Vanlauwe

Climate change is already occurring and future changes are inevitable. West Africa is one of the most vulnerable regions to climate change. In some countries, yield from rainfed agriculture is likely to decrease to 50 percent by 2020, thereby threatening food security along with other aspects of the Millennium Development Goals. Ayuom is a farming community in the semi-deciduous forest zone of Ghana with a population of about 1000 people. Continuous cropping with little external inputs in the form of inorganic fertilisers has resulted in soil fertility decline, and thus decline in crop yields. Increasingly unreliable rainfall coupled with a loss of soil fertility has resulted in food insecurity of the farming community.

Poverty is high in the community. There is an urgent need to empower local communties to debate on climate change as they are the most vulnerable. Through farmer participatory on-farm studies on Integrated Soil Fertility Management (ISFM) initiated in 2002, the community is already adapting to the impact of climate change. Such local approaches, however, are fragmented and mechanisms for communicating successful practices remain limited.

Awareness of climate change is now being promoted through stakeholder involvement in workshops, learning forums, farmer field schools and farmer participatory research. The study also involves greater participation of both the print and the electronic media to create awareness of climate change adaptation options available to the community.

Farmers are adapting to the precarious situation through the use of indigenous knowledge, varying cropping systems, the use of drought tolerant maize varieties, changing of food habits, and the use of agro-chemicals. Many indigenous and traditional farming practices have immense potential for wider use to increase adaptation to climate change. National environmental policies need to be focused on those areas where they will be most effective.

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Programme de promotion de revenus ruraux, Madagascar

by Aimé Randriambola & Niaina Rakotondrastima

Madagascar a connu plusieurs bouleversement dus à la variabilité climatique actuelle et à celle des dernières décennies. Parmi les plus importants de ceux-ci on compte les cyclones, les inondations et les sécheresses. Ces perturbations deviennent de plus en plus fréquentes et intenses et génèrent des impacts importants que l'on compte notamment en termes de pertes de vies humaines, de diminution des productions agricoles et animales, de destruction des infrastructures, de dégradation des ressources naturelles (eaux, sols et forêts) et d'érosion côtière, rendant ainsi précaires la sécurité alimentaire, l'alimentation en eau potable et l'irrigation, la santé publique et la gestion de l'environnement et du mode de vie. Ces impacts mettent la population malgache et ses activités de développement en situation de vulnérabilité répétitive et croissante.

Le projet FIDA PHBM (Projet du Haut Bassin de Mandrare) situé au sud-est de l'île (zone sèche) s'est achevé en 2009 et a conduit plusieurs activités de reboisement, en étroite collaboration avec le Service malgache de l'environnement et des Eaux-et-Forêts de Tsivory. Le projet PPRR (Programme de Promotion de Revenus Ruraux) vient d'être mis en place dans la côte est du pays (régions cycloniques). Le projet a conduit plusieurs activités en vue de la construction d'infrastructures anticycloniques. Les deux projets ont touché près de 50,000 ménages à ce jour.

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Promotion of rural income programmes in Madagascar

by Aimé Randriambola & Niaina Rakotondrastima

Over the past decades, Madagascar has experienced several turmoils due to the current climatic variability. Amongst the most notable are hurricanes, floods and droughts. These perturbations are growing in frequency and intensity, and have a significant impact on the loss of human life, the reduction of agricultural and animal production, the destruction of facilities, damage to natural resources (water, earth and forests) and coastal erosion. Consequently, this is threatening food security and access to drinkable water supplies, irrigation, public health, and environmental and life management. These impacts are putting the Madagascan population and their development activity in a position of repeated and growing vulnerability.

The FIDA MHBP project (Mandrare Higher Basin Project), set in the South-East region of the island (its dry area) was completed in 2009 and led to several afforestation activities, in close collaboration with the Madagascan Service for Environment and Waters-and-Forests of Tsivory. The RIPP project (Rural Income Promotion Programme) has just started in the country's West coast area (its cyclonic area). The project has led several activities with the objective of building anticyclonic facilities. Both projects have had a significant effect on the lives of about 50,000 households to this day.

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La régénération naturelle assistée comme moyen de combattre le changement climatique en milieu rural

by Par Awaiss Yahaya

L'environnement naturel du Niger est aride. La pluviométrie est faible et variable et les températures sont élevées. Malgré les contraintes naturelles et la variabilité du climat, le secteur rural constitue une partie très importante de l'économie nationale. L'agriculture et l'élevage représentent les principales activités de la majorité des populations rurales. Ainsi, pour lutter contre la désertification et la dégradation des ressources naturelles, qui ont pour conséquence une augmentation de la pauvreté et de la vulnérabilité des populations rurales, la Régénération Naturelle Assistée (RNA) est une pratique largement adoptée des ruraux de la région de Maradi.

La RNA consiste à laisser aux champs un certain nombre de jeunes pousses, de souches ou de rejets sur souches selon une certaine densité à l'hectare afin de régénérer la végétation dans les champs. Parmi les impacts socio-économiques de la RNA on compte la réduction de la pauvreté grâce à l'augmentation de la production agricole, la production de fourrage pour les animaux, de bois pour les besoins du ménage et pour la vente, et une diversification de l'alimentation entraînant des conséquences positives sur la nutrition et la santé. Bien qu'étant intégrée dans le système d'exploitation des paysans, cette pratique connait quelques difficultés notamment en ce qui concerne le droit d'exploitation des arbres entretenus, les coupes frauduleuses, le surpâturage. C'est pour améliorer cette pratique sur le plan communautaire et permettre aux populations de développer des stratégies résilientes au climat que Care Niger va développer des programmes dans la région de Maradi.

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Assisted natural regeneration as a way to combat climate change in rural areas
by Par Awaiss Yahaya

The natural environment in Niger is arid. Recorded rainfalls are very low and variable, and temperatures are high. Despite natural constraints and climate variability, the rural sector stands for a high percentage of the country's economy. Agriculture and animal breeding are the rural populations' main activities. Thus, in order to fight against desertification and natural resources damage, both increasing rural poverty and vulnerability, the Assisted Natural Regeneration (ANR) is a largely adopted practice by the rural population of the Maradi area.

The ANR consists of leaving a certain number of young shoots, stumps or stump shoots within the fields, according to a certain density per hectare, in order to regenerate field vegetation. The ANR is giving way to many socio-economic improvements: the reduction of poverty by an increase in agricultural production; the production of animal fodder; the production of wood for household needs and sale; and growing food diversification, which has a positive impact on nutrition and health. Although such activities are integrated within the farmers' business, these practices face a number of difficulties: such as the right to exploit "kept" trees, fraudulent cuttings or an overgrazing tendency. In order to improve this practice on a community level and to allow populations to develop climate resilient strategies, Care Niger is going to develop such programmes in the Maradi region.

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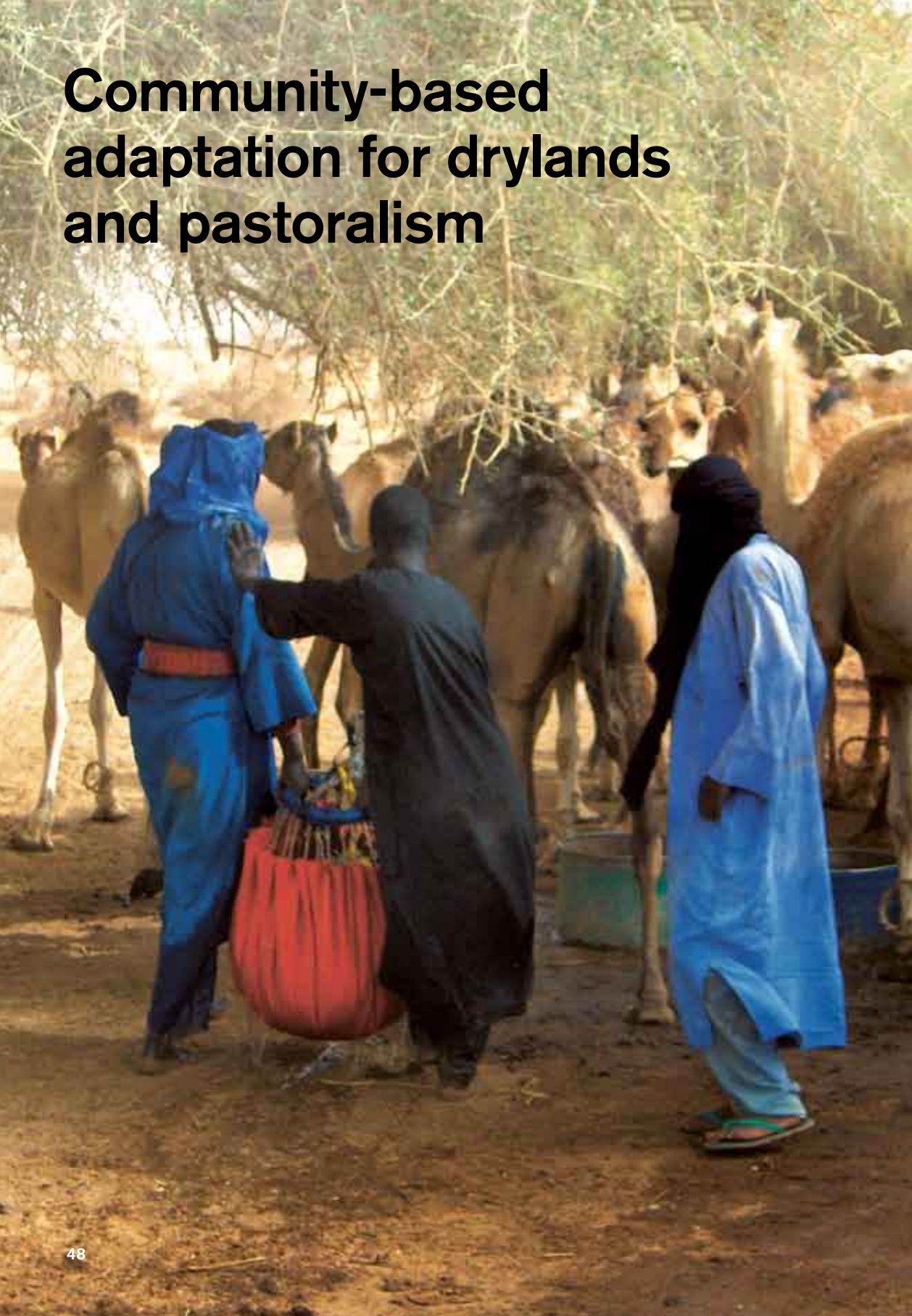
Community-based adaptation for drylands and pastoralism



Adapting pastoral and agricultural practices to the realities of climate change in Niger
by Adeline Aubry

The Community-Based Adaptation Programme is a five-year United Nations Development Programme global initiative funded by the Global Environmental Facility (GEF). The project's implementing partner is the GEF Small Grants Programme (SGP). Co-financing partners include the Government of Japan, AusAID, UN volunteers, and local NGOs. The CBA's goal is to strengthen the resiliency of communities to adverse climate change impacts.

The CBA project, Adapting Pastoral and Agricultural Practices to the Realities of Climate Change, focuses on the village of Rombou in the Maradi region of central Niger. The Sahara desert and bordering semi-arid Sahel zone cover approximately 80 percent of the country's land. A majority of Niger's water resources are concentrated in a small green belt in the south. The Tarka Valley is one of the nation's few remaining fertile areas. Although it borders the Tarka Valley, the village of Rombou is at risk of desertification as the semi-arid Sahel zone expands.

The project area has a strong tradition of pastoralism dating back to its original inhabitants, the nomadic Touareg and Peulh tribes. Farmers from the Haoussa tribe moved into the area during the 1960s in search of fertile land. Both pastoralists and farmers now depend on increasingly scarce natural resources for their livelihoods. Plagued by high levels of poverty and structural food insecurity, the area suffers from unsustainable agropastoral practices and increasing risks of conflicts over natural resources. Working with three communities consisting of about 6,000 people, the CBA project will involve 2,000 participants in activities that promote more sustainable agricultural and pastoral practices; and will help the population deal with predicted climate changes.

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Establishing community-based sustainable rangeland resource management systems in the Gash Barka Zone, Eritrea

by Amanuel Negasi, Mesghena Ghilay Hagos & Tsegai Araya

The livestock in the western lowlands of Eritrea rely almost entirely on grazing and browsing on the rangelands and riverine vegetation following the grazing routes. Recurrent droughts caused by climate change have resulted in a shortage of grazing resources, hindrance of cattle movement and environmental degradation.

The objective was to tackle the critical drought season by extending the grazing period and minimising the livestock migration season. Since 2004, the general regeneration of natural resources, particularly of herbaceous and tree layer biomass, has been observed thanks to the introduction of a community-based rangeland management system aided by International Fund for Agricultural Development (IFAD) funded projects. The main activities were: the establishing of Voluntary Livestock Exclusion Areas; the treatment of denuded rangelands using various soil and water conservation measures; the construction and distribution of livestock watering points; and, over-sowing adaptive native grass seeds.

According to the impact assessment report, the project resulted in a tremendous increase of total area closures; rising from an initial 15,696ha to a total area of 105,450ha. Hence, the production of biomass has increased significantly with 527,250 tons, as opposed to only 47,088 tons before the project.

Urea straw treatment training for agro-pastoralists

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The survival of pastoralism in a changing climate in Northern Kenya
by Eric Kisiangani

The links between development and climate change adaptation, and reducing social and environmental vulnerability are now more urgent than ever in pastoral areas of northern Kenya. Supportive government policies are essential.

Enhancing Adaptive Capacity of Pastoralists to Climate Change in Northern Kenya was a two-year project undertaken on adaptation of pastoralists based on data generated from Turkana and Mandera research sites.

The objectives of the project were to:

- Identify ecological and structural factors underlying vulnerability of pastoralist communities to climate change
- Identify and evaluate gender dimensions of vulnerability amongst social groups in Turkana and Mandera
- Undertake participatory analysis of traditional and emerging climate change adaptation options and strategies, at both household and community levels, against future scenarios
- Identify factors constraining pastoralists' access to, and use of, climate change adaptation options and strategies in pastoral ecosystems of Turkana and Mandera districts
- Identify and analyse the institutional barriers to, and opportunities for, incorporating climate change adaptation measures into national development policies

The research showed three main strategies for household survival: physical, capital and pastoral strategies. These range from herd accumulation, animal diversity and a more varied diet; to herd mobility beyond the normal dry season grazing areas, herd dispersal, selective breeding, intensification of land for animal feed, and conquering "enemy" grazing land or acquiring permission to use it.

The two-year project revealed four policies where action and resources are needed. Firstly, peaceful coexistence and security amongst local communities in northern Kenya must be strengthened for effective adaptation of pastoralists through improved access to pasture and water. Mobility must also be ensured for livestock herds because access to pasture and water is the best adaptation strategy for pastoralists. This must be recognised and supported by the government agencies responsible for protecting pastoralists' land and resource rights. Moreover, increased access to additional adaptive skills in planning and managing rangeland resources is needed, as well as access to sources of information such as seasonal forecasts and market intelligence. Lastly, the removal of constraints to efficient livestock markets: improved market infrastructure, vet services, flood-proof roads, and communication links.

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Pastoralism and climate change: enabling adaptive capacity
by Brian Otiende

The effects of climate change on the drylands of the Horn and East Africa pose particular and difficult policy challenges in the region. The drylands are characterised by an arid climate that makes them highly vulnerable to the impacts of climate change. Climate science already projects increasing temperatures, rainfall variability and increasing frequency and severity of extreme weather events including droughts. In addition to the chronic poverty levels amongst pastoral communities, underexploited development potential and poor policies that conflict with the unique needs of the drylands, climate change will result in the loss of pastoral livelihoods and will exacerbate poverty levels amongst dryland communities.

This study argues that climate change presents both a challenge and an opportunity for development within drylands. Of all the natural resource-based land uses in the drylands, the dominant land use system – pastoralism – has unique adaptive characteristics. However, this must be supported by the appropriate enabling policies and investments. Pastoralism functions at a stronger level within the prevalent context of wide rainfall variability and unpredictability.

Pastoralism thus presents a logical adaptation route in areas of increased climatic variability, and has an important role to play where other livelihoods are threatened.

Pastoralists need the 'freedom to' take action, whether they choose to remain in pastoralism, or to diversify their livelihoods in a way which would ensure economic well-being

As opposed to providing adaptation strategies for them, pastoralists' resilience to drought can be improved by strengthening their inherent adaptive capacity, (autonomous adaptation); improved drought preparedness; disaster management structures and risk reduction efforts, (anticipatory adaptation); and, using climate information or foresight in development planning (planned adaptation).

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Community-based climate change adaptation strategies amongst pastoralists in Shinile Woreda of Somali Regional State, Ethiopia

by Nur Abdi Mohammed

Pastoralists perceive climate change as increased temperature, expanded desertification, droughts and reduction of grazing lands. Moreover, they experience climate change as reduced livestock productivity (milk, ghee and meat), change in livestock feed availability, reduced quality of natural pasture, and increased human and livestock diseases. In this regard, the Pastoralist Welfare Organization (PWO) has recently conducted a rapid assessment on community-based climate change adaptation strategies in Shinile Woreda of Somali Regional State, Ethiopia. The assessment focused on the major climate change hazards; their impact on livelihoods and traditional adaptation strategies; and, to some extent, development interventions.

The results of the assessment demonstrated evidence of climate variability and climate change, as seen through drought, extreme temperature, increased human and animal diseases, and rangeland degradation. Climate variability and change have led to pasture and water shortages, increased loss of livestock, and heightened vulnerabilities to climate change hazards amongst pastoralists. The assessment results have also indicated that communities are doing their level best to cope with climate change hazards through spatial mobility, digging of water wells in the riverbeds, and birka construction amongst other strategies. These traditional adaptation strategies are currently less effective due to prolonged droughts,

heavy floods, deepening of underground water, inadequate skills and inter/intra-clan conflicts. The development/non-traditional interventions are also challenged by climate change impacts such as the drying up of many water sources like shallow/hand dug wells, ponds and reservoirs. As per the projected climate change scenarios in the lowland parts of Ethiopia, climate change hazards may continue to harm traditional adaptation strategies as well as modern development interventions. In order to reduce the impact of these climate change hazards, there is a need to diversify pastoral livelihood activities. In addition to modifying livestock diversity, composition and numbers, there is a need to engage in saving and credit, education and skill development amongst other strategies.

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Local climate change adaptation strategies amongst pastoral communities in Awash Fentale Woreda, Afar National Regional State, Ethiopia

by Wendessen Gulelat Wolde

Studies show that pastoral communities are the first to be affected by the adverse effect of current and future climate change in Africa. Pastoral communities in Ethiopia have been adapting their livelihoods to changing environmental conditions for centuries. Pastoralist Forum Ethiopia (PFE) in partnership with Promoting Local Innovation in Ecologically-Orientated Agricultural and Natural Management (PROLINOVA) Ethiopia, have conducted an in-depth study on climate change variables and local adaptation strategies of Afar pastoral communities in Fentale Woreda, Afar National Regional State.

The result of this project reveals that there is evidence of variability in rainfall and temperature across the years, as well as an increasing trend in wind speed. The research also demonstrates that pastoralists have innovatively adapted to the harsh climate situations. Mobility with its own specific pattern was found to be one of the key local innovations in adapting to climate change. In the study area, social safety nets; development of the local level conflict management system; herd splitting; species diversification; livestock selling and bank deposits; animal disease management; and livelihood diversification such as petty trade and daily labour were also found to be important local adaptation strategies. However, the communities' adaptive capacity was also significantly threatened by certain non-climatic factors such as: the establishment of national parks and large scale commercial farms, resulting in the loss of community-owned small farm land, the loss of pastureland, and the blockage of water access; as well as other factors like bush encroachment (*Prosopis*).

Afar community

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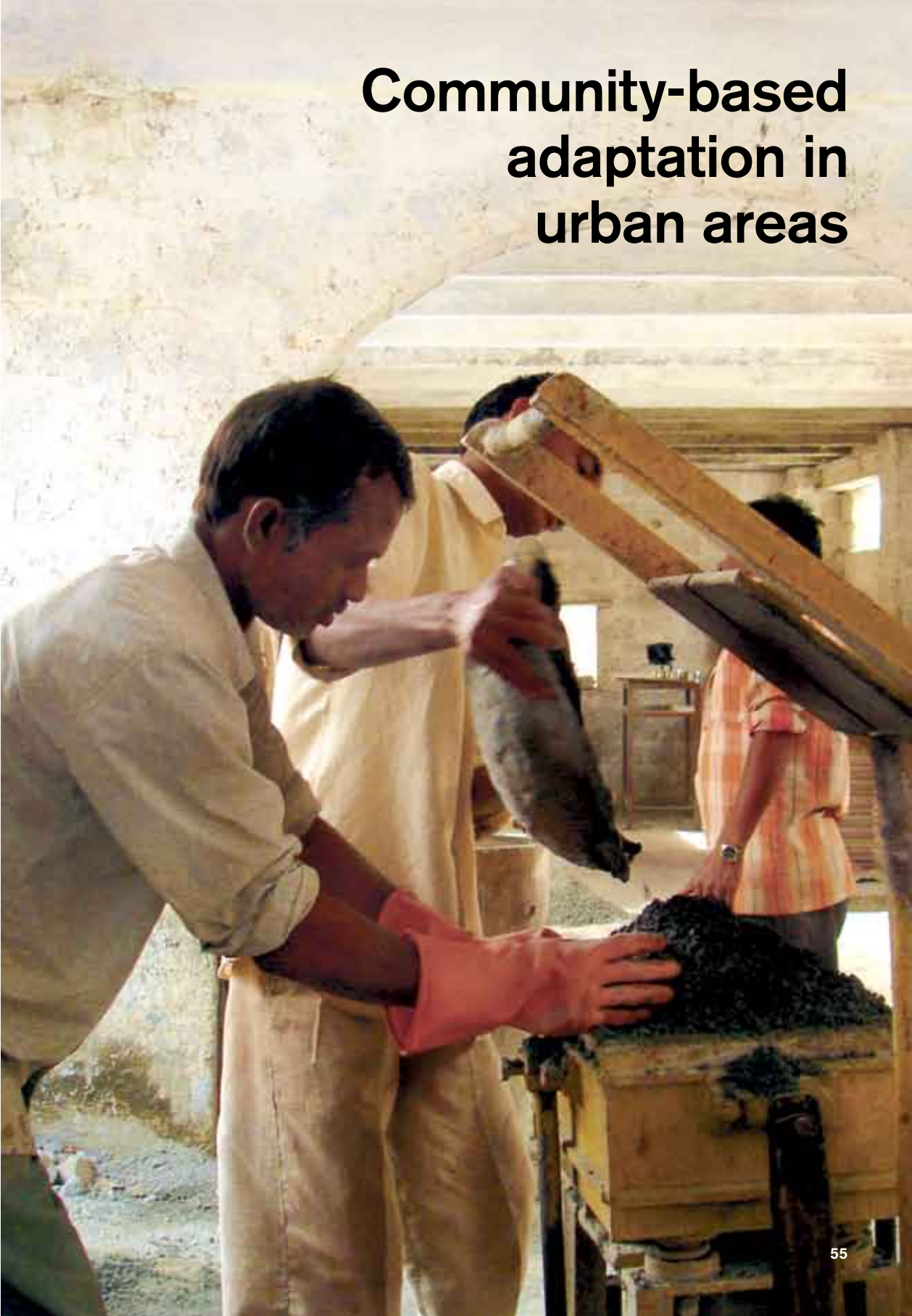
Community-based adaptation in urban areas



Old notion - new relevance: exploring the concept of social capital in the context of climate change adaptation in East-African coastal cities

by Justus Kithiia

Most studies using the concept of social capital focus on its role in facilitating development outcomes in rural as opposed to urban areas. Indeed, few studies have shown how this old sociological notion can attain new relevance by motivating the initiation and accomplishment of measures to overcome urban climate change risks, more so in Africa. However, not only are millions of city dwellers in Africa at risk from the impacts of climate change, but communication and linkages that bring critical resources to bear are easier in the cities than in rural areas. Addressing adaptation to the uncertain climate using social capital discourses will be of necessity and will involve removing the informal-formal barriers and allowing social cohesion through engagement in mutually beneficial, vulnerability-reducing collective actions.

This work builds on the existing conceptualisation of social capital and associated concepts in climate change theory and policy. The application of the concepts, and their use in framing the debate and thinking of the role of social capital in facilitating adaptation to climate change in the East African cities of Mombasa and Dar es Salaam is explored.

Mombasa and Dar es Salaam are port cities which represent important national and regional engines of economic development. In addition to their ports, they contain important infrastructure such as airports and refineries; as well as a substantial workforce. Furthermore, they are important centres of coastal tourism.

This project found that in relation to climate change, local capacities mediated through social capital can:

- Provide a foundation for effective climate change adaptation
- Ensure acceptability and effectiveness
- Build adaptive capacity at a range of urban scales

The use of social capital in the context of climate change will succeed if viewed as an element in the wider theme of sustainable development; as well as choosing adaptation strategies in the context of poverty driven economic survival urbanisation. It is also vital that policies are aimed at linking climatic conditions with urban development, housing, land use management and information dissemination. Lastly, there exists the larger need to transcend social divisions and build horizontal and vertical social cohesion to confront the uncertain changes in climate.

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The climate change adaptation deficit of Lusaka City in Zambia
by George B. Kasali

Sensitivity to drought

This paper examines the exposure of Lusaka, the capital city of Zambia, to the climate extremes of droughts and floods, and makes recommendations for planned adaptation. The sensitivity of the city to these extremes is investigated in terms of the impacts on water supply, sanitation, health, infrastructure and food prices. The adaptation deficit is assessed by evaluating the adaptive capacity of the city in terms of institutional and community responses to climate-induced disasters that have occurred over the years.

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Reducing the vulnerability of urban poor in Indian cities through adaptive strategies

by Yenneti Komalirani & Joshi Gauravkumar

Climate-related disasters have brought widespread misery and huge economic losses to India, adversely affecting public health, food security, agriculture, water resources and biodiversity. In the case of Indian cities, the size and vulnerability of informal settlements, generally built in fragile areas such as coastal zones, flood-prone planes and ravines, and geologically unstable slopes, greatly increases their vulnerability which thus forces them to follow a path of adaptation for sustainable development.

The rapid pace of urbanisation with the concentration of an ever increasing share of the population has also significantly increased the overall vulnerability of urban areas to such dangers. With regard to this, the paper deals with the assessment of impacts, vulnerability and adaptation to climate change in Indian cities. While dealing with the relationship between climate change and Indian cities, the research assessed the impacts of climate change and vulnerability of the urban poor in Indian cities. This paper will also identify some adaptation measures that can be undertaken by the urban poor and the Government, especially through analysing the case studies in an Indian context.

The success and failure of implementing adaptation measures depends largely on policymakers. There is a need to strengthen the institutional and financial capacity of the city's decision-makers and administrators, who ultimately control the built environment and the power to implement change. This sensitisation would prove to be an effective tool to protect the microenvironment as well as create awareness about the poor.

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Strengthening urban governments in planning adaptation
by Lucinda Fairhurst

Climate change is expected to have severe physical, social, environmental and economic impacts on cities in Africa. It is predicted that certain areas will be affected by sea-level rise, increased precipitation, increased wind speeds and incidences of cyclones, a higher frequency of droughts, and a rise in temperatures. This project aims to address the knowledge, resource, capacity and networking gaps of five Southern African cities by strengthening their ability to plan for, and adapt to, the impacts associated with climate change. There are five urban centres chosen for this project, one of which is Windhoek in Namibia.

The project will test the theory that the most vulnerable people living and working in these different geographical, climatic and ecosystem zones will be impacted by climate change in very distinctive ways. Therefore, unique sets of actions will be required to be undertaken by the respective local governments in order to address their vulnerability to climate change. Through this project, tailor-made Local Climate Adaptation Frameworks will be developed for each local government.

These frameworks will provide the necessary steps to enable the future extension of a participatory approach, with multiple stakeholders, for the implementation of climate change adaptation strategies and policies. Furthermore, it will review the important economic, social and environmental costs of climate change; with particular reference to gender impacts and issues, and placing an emphasis on the importance of early action. The frameworks will highlight areas of concern within the five project cities and encourage the development of early warning systems that will reduce the risks of climate change. Lastly, the frameworks will provide the necessary steps for increasing adaptive capacity and lay the groundwork for a Local Climate Adaptation Strategy and Action Plan for each of the project cities.

Through a participatory process, this project will build on, and/or establish long-term, multi-disciplinary and multi-sectoral stakeholder platforms in the five Southern African cities. These platforms will comprise of academics, communities and the local government, and will facilitate knowledge-sharing as well as promoting proactive climate adaptation and resource opportunities in the cities. Networks of stakeholders within each urban centre will be established, in turn feeding into a larger regional network of local authorities and partners in Sub-Saharan Africa; and then globally through the existing International Council for Local Environmental Initiatives (ICLEI) global network, ensuring global best practice, roll-out and long-term sustainability.

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Managing and communicating knowledge about good community-based adaptation

How online tools can be effective in learning and sharing about climate change adaptation: experiences from the Oxfam and weADAPT collaboration

by Anna Taylor & Charlotte Sterrett

Oxfam Great Britain (GB) has been working in collaboration with weADAPT since mid-2009 to design a suitable online knowledge base and web platform for learning and sharing on climate adaptation that can be easily accessed and used by Oxfam practitioners. The overall aim of the collaboration is to 'Create and sustain a global online learning and sharing resource for Oxfam GB programme practitioners working on climate change adaptation'.

weADAPT offers both the technology and an expanding network of leading organisations across a range of sectors to grow, manage and deliver critical information and knowledge in order to make better informed adaptation decisions, plans and strategies from local to national and regional scales. weADAPT transforms information into knowledge by creating meaningful links between resources using state-of-the-art semantic search technologies, and thereby supports users in their learning process.

During the development of weADAPT, many lessons were learned including the need for more 'translation', less technical language, and the need for more context specific examples of adaptation. We observed a mismatch between the information that practitioners want, and the answers that science can provide (e.g. detailed information on impacts). There also exists a preference for audio-visual mediums as well as a need to navigate and find content more easily. Lastly, there is the larger need to move beyond information sharing to knowledge co-production.

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Climate through culture: British Council climate change work in Sub-Saharan Africa and how we support future policy

by Hannah Cowin

The British Council (BC) has been engaged in climate change activities since the 1992 Rio summit. In recent years this work has been focused on developing informed and connected young leaders who have the ability to influence decision-makers to take positive action in order to prevent or reduce climate change on local, national and international levels.

The British Council sent a group of "International Climate Champions" from across the globe to the UNFCCC Kyoto Protocol (COP 3) in 1997. This was so successful that a further group attended the recent summit in Copenhagen. In Sub-Saharan Africa there are now groups of BC International Climate Champions in ten countries: Kenya, Nigeria, Tanzania, Ghana, Uganda, Sudan, South Africa, Botswana, Malawi and Zimbabwe. Champions are young people with a passionate interest in climate change who want to make a difference. They spend a year working with their local communities carrying out projects that raise awareness of climate change and encourage people to change their behaviour. The BC supports the Champions with training in project management and communication. Champions work with their local communities to implement changes on projects like plastic bag bans or "greening the school". An important part of local work is encouraging others within the community to get involved.

Africa Talks Climate (ATC) involves research conducted with the British Broadcasting Corporation World Service Trust (BBC WST) in ten African countries. Its focus is to engage, inform and empower Africans at local, national and international levels about climate change. The initiative collates community opinions and gives voice to people at all levels of society. ATC will inform the work of the British Council amongst others working on regional climate change projects with the publishing of the results in early 2010. We expect the findings to develop into a climate change communications strategy and help shape future project development.

The BC focuses on youth and leadership: raising awareness and empowering and informing young people who are our future community, national and international leaders and policymakers. Overall we hope our projects will reach out to rural and urban communities across the region, and influence leaders through the voices of the young, thus helping climate adaptation and mitigation methodologies to become a part of daily life for people in Africa and across the world. As a cultural relations organisation, our focus is on cross-cultural international knowledge exchange and acquisition, and trying to emphasise the global interdependency of this issue. The BC hopes to ensure that our work helps all sectors of society to work together, regardless of status or income, to take a community approach to solving a global problem.

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The Regional Climate Change Adaptation Knowledge Platform for Asia
by Satya Priya & Roopa Rakshit

The Regional Climate Change Adaptation Knowledge Platform for Asia (Adaptation Knowledge Platform) has been developed to respond to demand for effective mechanisms for sharing information and developing adaptive capacities in Asian countries, many of whom are the most vulnerable to the effects of climate change. The Adaptation Knowledge Platform supports research and capacity building, policy making and information sharing to help countries in Asia adapt to the challenges of climate change. The Adaptation Knowledge Platform will seek to facilitate climate change adaptation at local, national and regional levels; and to strengthen adaptive capacity of countries in the region – whilst working with existing and emerging networks and initiatives.

The Adaptation Knowledge Platform supports the mainstreaming of climate change adaptation into regional economic and development policies, working together in partnerships, and complementing and bridging both existing and emerging networks and knowledge. Activities implemented fall under three main components:

- Generating new knowledge on climate change adaptation
- Translating science into policy relevant knowledge
- Working towards an effective knowledge sharing system, at regional and national levels

In 2009, activities were initiated in the five pilot countries, Bangladesh, Cambodia, Nepal, Thailand and Vietnam, mobilising local partners and identifying key knowledge and capacity gaps. The major challenges faced were associated with the diversity among countries with regards to priority, production, dissemination and utilisation of climate change adaptation knowledge. Problems included weak or non-existent information and knowledge of management procedures, inadequate information and communication technology infrastructure, insufficient networking activities, and lack of financial resources to support knowledge management activities.

The Adaptation Knowledge Platform's knowledge management focused on activities supporting three pillars: networking, developing and sharing knowledge; the necessity to work collaboratively with access to shared knowledge at local, national and regional levels; and, contributing to a lasting climate adaptation knowledge legacy. The report presents strategic directions for knowledge management at both regional and national levels.

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Collaborative change: approaches and experiences in ComDev applied to community-based adaptation

by Cleofe Torres & Federica Matteoli

Community-based adaptation approaches emphasise the need to empower rural communities and identify, through participatory learning methodologies, suitable adaptation options. Planned knowledge and communication activities have to be acknowledged as strategic assets to improve information sharing, peoples' participation and concerted action towards social learning for livelihood adaptation.

As recommended by participants at the 3rd CBA Conference, communication processes and strategies are essential to enhance rural institutions' capacity to assist small farmers and reduce communities' vulnerability. These should be fully integrated and mainstreamed within the CBA approach in order to:

- Facilitate equitable access to knowledge and information
- Enhance learning and action to ensure co-creation of knowledge
- Promote peoples' participation and direct involvement in the design of coping strategies
- Bridge the "glocal information divide" between global environmental systems and local communities; improving linkages amongst research, extension, advisory services and farmers.

The United Nations Food and Agriculture Organization is implementing the Communication for Sustainable Development Initiative (CSDI): a global programme to test, document and share communication strategies, services and tools for climate change adaptation and sustainable Natural Resources Management (NRM). Based on two cases in Congo and Bangladesh, this presentation will draw on field experience to demonstrate that sharing knowledge on good practices amongst peers fosters horizontal collaboration and helps rural people define new adaptation strategies to climate change, while reaffirming their right to communication services.

The contribution will also introduce a CSDI initiative in response to the need for enhanced communication capacities amongst development practitioners, field agents and decision-makers. It aims to establish a cross-regional and cross-institutional community of practice for sharing information and knowledge on communication applied to climate adaptation, through networking and partnerships with development programmes, institutions, non-government organisations, universities and research centres.

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An innovative knowledge sharing network for climate change adaptation in Africa
by Moussa na Abou Mamouda

AfricaAdapt is an independent bilngual network (French/English) focused exclusively on "Africa". The Network's aim is to facilitate the flow of climate change adaptation knowledge for sustainable livelihoods between researchers, policy-makers, civil society organisations and communities who are vulnerable to climate variability and change across the continent.

The network uses an interactive web-based information portal, as well as other media such as community radio, mobile phones, print publications, face-to-face meetings, etc. to share knowledge, know-how and any information to support climate change adaptation in Africa for the benefit of vulnerable communities.

Whilst the use of information technology is expanding rapidly across Africa, information and knowledge do not reach large sectors of the population, particularly the poorest. The result of this is that vulnerable groups will still be excluded from the knowledge exchange chain, in turn exacerbating their vulnerability. The AfricaAdapt Knowledge Sharing Innovation Fund focuses on those marginalised and hard-to-reach groups, and is looking to fund initiatives that involve them in the process of knowledge sharing through innovative ways of communication, ideas and methodologies.

The impacts of climate change and variability are already affecting the livelihoods of African communities. As media who have a fundamental interest in broadcasting about issues that are of key relevance to their listeners, community radio broadcasters have a responsibility to understand and communicate how climate change is affecting the people in their areas. They are also strategically placed as media who can interact with local communities in languages and formats that are easily understood, for better knowledge and information sharing at all levels.

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Community-based adaptation exchange (CBA-X)
by Blane Harvey

CBA-X is a shared online web space designed to bring together those working in this field. It is supported by the International Institute for Environment and Development and hosted by Eldis. CBA-X facilitates the exchange of community-based adaptation knowledge between continents, sectors and disciplines, with a focus on: news and commentary; cutting edge research; relevant case studies; and tools and practice. There are over 650 members, 65 percent of which are from the global south.

CBA-X uses a number of interactive and multimedia tools such as: blogs and discussions, calendar of events and videos. The uploaded resources on the CBA-X platform are linked to summaries on the Eldis Climate Change Resource Guide, which provides access to more than 1,600 fully summarised climate-related documents; and links to over 250 organisations working on climate change issues.

A number of complementary Institute of Development Studies Knowledge Services on Climate Change will be introduced, as well as an overview of how CBA-X can help you in your work.

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The role of radio in creating better responses to climate change: the Development Broadcasting Unit in Malawi

by Hamilton Chimala & Charles Chikapa

The Development Broadcasting Unit (DBU) was established in September 1999 as an autonomous not-for-profit, public sector unit under the Malawi Broadcasting Corporation-MBC. The Unit engages in development communication programming using participatory approaches to provide a platform for the marginalised poor. The format uses Radio Listening Clubs in which local leaders discuss issues which they would like to see addressed by the Government or any other stakeholders in their respective areas. The Development Broadcasting Unit plays a facilitating role by linking the listening clubs with the relevant specialists in a particular topic. A forum is organised where the official, or officials, are put in the spotlight by the local communities. The dialogues are recorded and packaged by the communities themselves and sent to the DBU offices, where they are edited and then aired on national radio.

The project has proved hugely popular, and plans are underway to seek funding to start "live" broadcasts, with a long-term goal of establishing community radios using the Radio Listening Clubs as focal points.

Radio listening club

Success stories using this Radio for Development approach in Malawi are well documented. Facilities such as health centres, clinics, and water points to mention but a few have been provided in the remote parts of the country. Climate change is a new topic that the DBU has taken on board, and currently several projects are in the formulation stages to be rolled out in 2011.

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Le réseau AfricaAdapt
by Binetou Diagne

Le réseau AfricaAdapt vise à promouvoir le partage des connaissances sur l'adaptation aux changements climatiques en Afrique. Il veut capitaliser et communiquer les nombreuses connaissances locales et leçons qui ont été tirées des expériences sur le terrain. Le réseau invite tous les acteurs aupartage, notamment les communautés moyennes qui demeurent à ce jour en marge des processus formels de partage des connaissances.

Grâce à une approche intégrée, le réseau AfricaAdapt utilise aussi bien les nouvelles technologies de l'information que les moyens de communication traditionnels pour toucher ses publics variés: chercheurs, décideurs politiques, société civile, et communautés locales.

Le réseau innove aussi en lançant son Fond d'Innovation pour le Partage de Connaissances qui promeut les initiatives de partage de connaissances au niveau communautaire.

Son partenariat avec les radios communautaires vise notamment à améliorer la compréhension du changement climatique à l'échelon communautaire et à renforcer les capacités de résilience des populations.

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The AfricaAdapt Network
by Binetou Diagne

The AfricaAdapt network aims to promote the sharing of knowledge on climate change adaptation in Africa. It seeks to capitalise as well as communicate the rich local knowledge and the lessons that have been learned from local experience. The network is inviting all participants to share, in particular the middle-class communities whom to this day tend to remain aside from formal actions of knowledge sharing.

Thanks to an integrated approach, the AfricaAdapt network uses both new media technologies and traditional means of communication in order to reach varied audiences: researchers, political decision-makers, non-trading companies and local communities. The network is also innovating by launching its Innovation Fund for the Sharing of Knowledge, which is promoting sharing initiatives at the community level. Its partnership with community radios aims specifically at improving climate change understanding at the community level, as well as reinforcing the resilience capacity of the population.

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Scaling up and replicating best practice

Incorporating sustainable livelihoods, disaster risk reduction and natural resource management into climate change adaptation approaches: an Oxfam GB perspective

by Charlotte Sterrett & Steve Jennings

Oxfam GB believes that lifting people out of poverty and overcoming injustice is central to our mission, which is why tackling climate change is a major priority for our humanitarian, campaigning and long-term development work.

Oxfam's approach to climate change adaptation focuses on the core areas of disaster risk reduction, livelihoods and natural resource management; whilst ensuring that gender is addressed as a cross-cutting theme. It is an approach that includes working at multiple levels, from community and local, to national and international. The approach further advocates for a range of interventions that deal specifically with climate change impacts, as well as addressing the underlying vulnerability to climate risk.

In addition, Oxfam is addressing climate change through its programme management cycle: from identification and analysis; to programme planning and design, implementation and management; through to monitoring, evaluation and learning.

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Critical factors for up-scaling community-based adaptation technologies in semi-arid areas: experiences from food security initiatives in Zimbabwe

by Douglas Gumbo

The food security initiatives implemented by Practical Action in Zimbabwe included rain-water harvesting technology as a major component. These initiatives will be used as a case study to identify the different scaling up models and their critical success factors. The paper contributes to answering the question posed by development practitioners on how successful rainwater technologies can be promoted and adapted to other regions, countries and sectors in order to improve their replication and up-scaling. The enabling environments necessary for up-scaling and replication elsewhere will also be explored. Replication and up-scaling tend to be used in tandem. This paper will highlight their use and distinguish between the two in order to demonstrate how support organisations can promote rainwater harvesting technologies.

The paper will conclude by suggesting the major steps that support organisations and policy makers can adopt in mobilising communities to up-scale rainwater harvesting technologies in order to improve food security in areas facing low and reducing rainfall.

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Institutional collaboration and up-scaling of water harvesting in Tigray, Ethiopia: the experience of the Relief Society of Tigray

by Teklewoini Assefa

Up-scaling community-based adaptation is crucial for allowing communities to adapt to future changes and to respond to planning processes and adaptation finances. Experiences of up-scaling already exist and can thus form a basis for future learning. This project focuses on the adaptation experience of communities in Tigray region, in northern Ethiopia – one of the most vulnerable regions to climate change suffering frequent incidences of drought: on average every three years.

The Relief Society of Tigray (REST), in collaboration with local community institutions and governments, promotes various water harvesting technologies to address water availability for agriculture and households as critical enabling factors for adaptation. The activities focus on scaling up small-scale, labour intensive water harvesting technologies; organizing communities on a watershed basis and to undertake participatory planning; and community mobilisation for public work in collaboration with local Baito.

The presence of strong institutional collaboration and community governance was critical to the successful up-scaling of these crucial adaptation measures. Thus far about 1.4 million ha (50 percent) of the regional land mass have been covered with Soil and Water Conservation (SWC) measures. There has been an increased access to dry season irrigation from 4,000 ha in 2005 to 70,000 ha, with plans to expand to 300,000 ha over the next two years. Furthermore, irrigation is now practiced at the household, group and community level.

Many key lessons have been learned from the project. Firstly, the fact that communities are already coping demonstrates their capacity to adapt to climate change using their own initiatives. There is a great need to integrate good adaptation practices into existing development planning at community, regional and national levels, in collaboration with government institutions in order to achieve faster up-scaling. Civil society organisations are capable of piloting various types of local adaptation technologies, but scaling up is a major role of the Government because of its accountability to its citizens. Lastly, it is essential for the success of adaptation strategies to confront structural constraints to adaptation such as policies for water user rights, both at community and regional levels (conflict prevention).

Community mobilisation

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Greening Darfur: scaling up work to increase drought resilience by strengthening civil society organisations to manage development

by Mohamed Siddig Suliman

Practical Action has continued to implement development work in north Darfur throughout the conflict period, focusing on increasing food security through better soil and water management. A key aspect of the work has been building the capacity of community-based organisations, and then forming networks between them.

Building upon this work, a new programme called "Greening Darfur" is underway. The intended outcome of Greening Darfur is adaptive livelihoods. This will be achieved by bringing together the following elements:

- Civil society networks (networks of Village Development Committes and Womens Development Associations) achieving effective linkages between their members and government institutions
- Systematic gathering of relevant information on land, water, agriculture, livestock and climate
- Communication and awareness of this information for all stakeholders conducting Participatory Action Planning
- Presentation of Participatory Action Plans as projects to draw down financial resources - including international adaptation funds
- Implementation of the Action Plans, for example the construction of a water harvesting dam
- Replication of this planning process at all levels from village level up to territorial level.

Darfur has adopted improved stoves through the multiplier effect of 'Training of Trainers' training

The essential element for building adaptive capacity is an extensive phase of information gathering and sharing behind the design and implementation of project activities. Overall the project has witnessed many successes including strengthening partners who are involved in adaptation initiatives; enhancing local community capacities to contribute to the collection of local metrological data; and scaling up successful adaptation practices through influencing partners and donors.

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Vulnerable groups: women and children

Counting on women: climate change adaptation in the Himalayas
by Brigitte Leduc

With the increasing trend of emigration amongst men and the feminisation of agriculture, Himalayan women will play a crucial role in the adaptation strategies to climate change of their household and community. Work undertaken by the International Centre for Integrated Mountain Development (ICIMOD) in the Himalayan region on local adaptation to water stresses, on gender perspectives in rangeland resources management, and on climate change adaptation shows that women hold a rich knowledge and a variety of skills for maximizing the use of natural resources of the fragile mountain ecosystem and in farming practices. If their role were more fairly acknowledged, their experience could be an important asset for mountain communities in adapting to the new challenges of climate change impacts.

However, the gender perspective is still rarely integrated in climate change policy and strategies both at international and national levels. Similarly, the mountain perspective and the implication of its feminisation are also often lacking. ICIMOD is conducting gender analysis of the impacts of climate change in the mountain context; promoting the knowledge and skills of mountain women; and advocating for the integration of a gender perspective in any plan or strategy, addressing both women's and men's needs and reducing gender inequalities in order to build mountain peoples' resilience to climate change.

It is vital that gender become mainstream in climate change adaptation strategies in the the Himalayas. To illustrate this, in the Chitrali region women play an important role in a community early warning system, utilising stones as a flood monitoring system. When they interpret the danger, they signal other villages by shouting and the use of mirrors. Women also aid in the recovery effort by securing livestock and removing debris. This is but one example of the role women play which emphasises the need to include gender analysis in climate change adaptation work.

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Child-centred adaptation and disaster risk reduction: lessons from Mozambique

by Lydia Baker

The impact of climate change on children is no longer a distant scenario. Its effects are being felt today and the poorest children are already bearing the brunt. Water scarcity, reduced agricultural yields, and the increased frequency of disasters all hit children the hardest. Children also have many more years than adults in which they must face the impacts of climate change.

However, children are not only victims. They are also leaders in the fight against climate change and disasters. Given the space and opportunity to do so, children lead risk reduction and adaptation activities, engage the wider community, as well as ensure that they themselves are protected. Children can also influence the policy and practice of their local and national governments.

In Mozambique, the Junior Farmer Life School educates children on alternative agricultural practices and climate change; as well as innovative disaster risk reduction activities such as child parliaments in which children can express their views to decision makers. The project began with the objective to improve access to food and nutrition, and the livelihoods of both orphans and vulnerable children living in communities affected by HIV/AIDS. It provides a strong model for combining climate change with education on the impacts of environmental degradation.

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Flood and drought management strategies in the case of Oyola/Wakesi community and participatory video for participatory monitoring and evaluation

by Judi W. Wakhungu, Elvin Nyukuri, Dan Ongor & Charles Tonui

Adaptation has become part of the discourse of global warming and is now widely recognised as a fundamental and necessary response to the threat posed by the climatic changes that will occur, or are already occurring due to past and present carbon emissions. A new statistical analysis has estimated the global-scale net effect of climate change on crop yields for the world's six most widely grown crops. According to this study, "the historical temperature-yield relationships indicate that at the global scale, warming from 1981-2002 very likely offset some of the yield gains for wheat, maize and barley". Technological advances, rising carbon dioxide and other non-climatic factors had minimal effects on the yields for rice, soy and sorghum. This shows how most countries in Africa that depend highly on such commodities are facing the adverse impacts of climate change, both in terms of food security and human safety.

In Kenya, droughts and floods have become more frequent and intense. The country has witnessed increased average and extreme temperatures, successive crop failures, as well as the spread of vector-borne diseases like malaria to places where the disease is not known to be endemic. These climate driven changes affect resources critical to the health and prosperity of Kenya.

For example, the 1999/2000 La Niña droughts resulted in 4.7 million Kenyans facing starvation. The effects of the 2008/2009 drought could be more severe, but unofficial reports put the number of people facing hunger at some 10 million. These impacts, amongst others, portend a worsening of the situation in the future given that the global greenhouse gas emissions are continuing unabated.

Efforts are being made at the local level to document how communities are responding to these challenges. Here we focus on the two communities of Oyola and Wakesi, who reside on the fringes of Lake Victoria in the Kano Plains of Western Kenya. The African Centre for Technology Studies, in partnership with Uhai Lake Forum, is undertaking action research and testing an adaptation tool called Local Options for Communities to Adapt and Technologies to Enhance Capacity (LOCATE) methodology to document the findings.

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Lived experiences: adaptation to climate change in Gogonyo Sub-County, Pallisa District, Uganda

by Judi W. Wakhungu, Susan Nanduddu, Elvin Nyukuri & Charles Tonui

Climate change has become a local phenomenon just as it is a global one. The magnitude of climate variability is now being felt at almost all scales and in all regions with extreme events such as drought, excessive rainfall, cold and heat waves, as well as dry spells affecting much of rural Africa, Uganda inclusive. Climate change adaptation has now become indispensable due to the increasing vulnerability of rural populations to the associated effects. Remotely located communities in countries such as Uganda are likely to be more vulnerable due to their limited access to social services, their dependence on natural resources for their livelihoods, and the limited opportunity they have to inflence the policies that affect their lives. Gogonyo Sub-County in Pallisa District, Eastern Uganda, represents some of these characteristics and has been affected lately by droughts, excessive rainfall and dry spells, exposing people to hunger to such an extent that some food handouts were distributed in the area.

This study was conducted to assess the effects of climate change on rural livelihoods in Gogonyo with the aim of identifying practical adaptation and mitigation strategies for the population. The study assesses community perceptions on climate change and vulnerability. It also examines the impacts on livelihoods and the socio-economic setup of the Gogonyo sub-county.

The project was further responsible for training and awareness campaigns; improved networking; dissemination of rainwater harvesting; energy saving technology; drought resistant seeds; along with tree growing activities.

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

by Nancy Omolo

Pastoralists in Kenya earn their livelihoods in arid and semi-arid lands. The roles, relations, responsibilities, opportunities and constraints of pastoralists pose different challenges to women and men because of uneven access and control of resources. With few studies undertaken on the impact of climate change and its consequences, this research focused on using quantitative and qualitative methods as well as a multi-dimensional approach to assess vulnerability.

Using data on pastoralists' attitudes and perceptions related to climate change and variability on food security, it was found that women's workloads and the pastoralists over-reliance on food relief increased because of climate variability and change. Overall, the findings show that there are changing patterns of settlement (i.e. from nomadism to semi-permanent settlement). This has led to a diversification of livelihoods (i.e. turning to agro-pastoralism, urban employment, fishing and petty business as a source of income is now much more visible). Most importantly, there is an increase in the number of female-headed households but no evidence in the increase of women decision-making.

Women's focus group

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The role of ecosystems in adaptation

Ecosystem adaptation: What it is and why it is important to integrate it with community adaptation

by Beth Marshall, Jonathan Cook & Judy Oglethorpe

At the same time that communities are experiencing climate change, the natural systems on which they depend are also affected. This is resulting in shifts in the abundance and distribution of species which provide communities with natural resources (e.g. fuelwood, timber, foods and medicinal plants).

Ecosystem services such as water supplies, crop pollination and protection from natural disasters are also affected. Natural systems need to adapt, just as people do. They can achieve this more easily if other stresses like habitat destruction, over-harvesting of resources and pollution are minimised. But as climate change threatens people's livelihoods in rural areas of the developing world, they tend to fall back on natural systems as a safety net. This can further impair these systems' ability to adapt and continue to support human populations. Hence it is very important to plan adaptation holistically, taking into account the needs of both people and nature, and the close interrelationships between them. This means working at larger scales than a single community. The failure to mainstream ecosystem adaptation into community adaptation will risk short-term solutions for people that place increased pressure on the environment, leading to maladaptation and worsened conditions for communities in the longer term.

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Adaptive mechanisms at community level within the context of climate change and human-wildlife interactions in the Mount Kenya environment

by Liz Esiromo

Mount Kenya Forest is one of the largest and most commercially viable forest areas. It deserves protection owing to its exceptional biodiversity, presence of threatened species, and as a major water catchment area which supplies more than 80 percent of Nairobi water requirements and hydroelectric power.

Commercial logging continued after gaining independence in 1963, and demands for land resulted in excisions being made into the Forest Reserve, in turn contributing to substantial degradation of the forest. The Forest Act 2005 has resulted in local participation in forest management between government and communities. This project began with the premise that poverty is a core driving force for environmental degradation. An integrated approach addresses issues of current climate change and the ways in which communities are adapting to these new challenges with regard to water, livelihoods, community

empowerment and environmental conservation management. These community initiatives, especially regarding human/wildlife interactions, are leading to improved land productivity and incomes; and subsequently an improved quality of life for communities in these areas.

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Effective ecosystem-based adaptation in Madagascar: existing challenges and future priorities

by Tiana Ramahaleo & Alison Clausen

Madagascar is a country of exceptional biodiversity. Over 5 percent of the world's species, including a quarter of all primate species, are endemic to the island. The country's 20 million inhabitants are predominantly rural and highly dependent on the goods and services provided by natural ecosystems. Overexploitation of resources has already had significant effects on species and ecosystems: approximately 90 percent of the original natural forest has been lost, and the habitat that remains is poorly connected; whilst marine ecosystems suffer from sedimentation and overfishing.

Historically, the climate has played a central role in the development of the diversity found in Madagascar. However, the rate and unpredictability of current climate change has the potential to severely disrupt the fragile balance between human communities and ecosystems. Coupled with forecasted significant population growth, adaptation for ecosystems and human communities will be essential. Ecosystem-based adaptation is a promising adaptation strategy for Madagascar.

The World Wildlife Fund's Madagascar and Western Indian Ocean Programme Office is currently implementing a number of ecosystem-based adaptation activities. Early results from implementation of these projects, which are amongst the first adaptation activities to be implemented in Madagascar, have allowed conclusions to be reached about the key challenges to effective adaptation, along with the priorities for future adaptation directions.

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An integrated approach to community-based adaptation in Nepal
by Moon Shrestha

Since the Climate Change and Energy Unit started in 2003, climate adaptation has always been an important component for the World Wildlife Fund (WWF) Nepal. Initially, the programme focused more on understanding the impacts of climate change in the Himalayas, examining the vulnerability of the ecosystem and local livelihoods. Based on research and various assessments, WWF Nepal is piloting community-based adaptation in its priority area.

Vulnerability is assessed with the use of scientific data and the use of various participatory methodologies within the communities themselves, which proved to be an effective tool for incorporating communities' perceptions and experiences. Communities are active and at the forefront of the whole process, from the identification of adaptation priorities through to their implementation.

The approach of the pilot project is an integrated one examining the vulnerability of the communities and the ecosystem. The project has five major components which build the resilience against climate impacts:

- Assessing climate data
- Disaster risk reduction
- Building the resilience of the communities
- Improving climate change policy
- Communication of best practices

This pilot project has been able to integrate the different components of the climate adaptation work of WWF Nepal (such as hydro-meteorological research, biodiversity and habitat shift studies, livelihood and fresh water components, policy aspects etc.) and amalgamate them into one project. Based on the lessons learned from this project, WWF Nepal is planning to replicate and up-scale this integrated approach into its priority landscapes.

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Building resilience to global climate change within the Mesoamerican Reef
by Nadia Bood

Pieces of coral removed from the reef are used to form a wall to help protect the foundations of a church building in Kiribati, Tarawa

Climate change is expected to impact both natural and human systems, altering the productivity and functions of many ecosystems and human livelihoods around the world; with the Mesoamerican Reef (MAR) being no exception. For reef and mangrove resource-dependent communities of the MAR, climate change will compound existing vulnerabilities. Heavy dependence on ecosystem services places communities' welfare at the mercy of environmental conditions, such that if the availability and quality of these natural resources declines in the MAR, so too will the security of livelihoods and other social benefits tied to such resources. With climate-related impacts already being observed in the MAR, there is an urgent need for adaptive response measures to build resilience to climate driven threats.

The World Wildlife Fund has a project underway to foster climate change resilience building within both natural and human systems of the Mesoamerican Reef. Major focus is being placed on assessing reef resilience, coral garden exploration, mangrove mapping and pilot mangrove restoration, coastal community vulnerability assessment, and local based adaptation exploration, among others. The project has a holistic approach, addressing the significant and growing threat of climate change with an integrated vision. Efforts are currently underway in Belize and Honduras.

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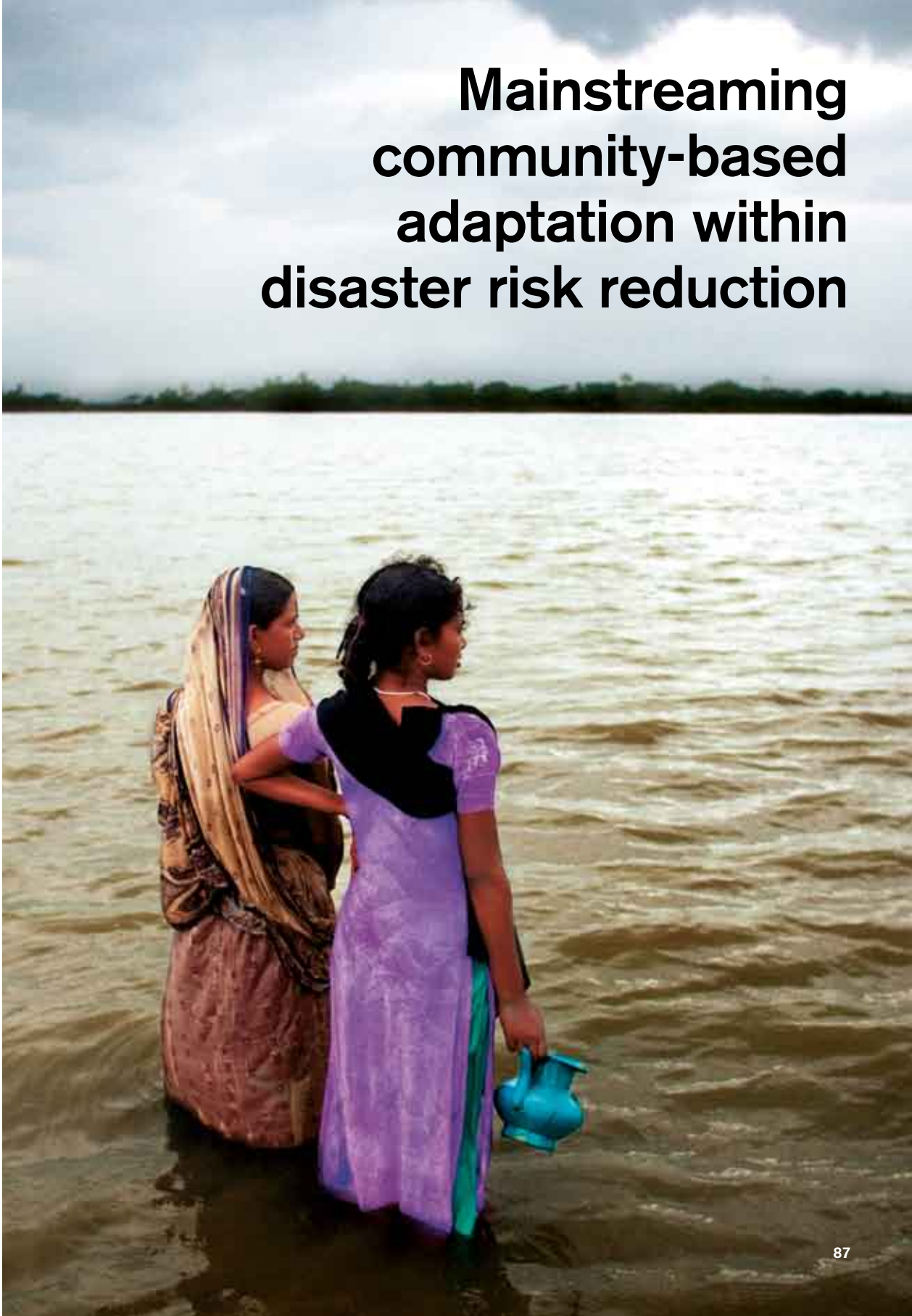
Mainstreaming community-based adaptation within disaster risk reduction



Building resilience to climate related shocks in the Greater Horn of Africa

by Mark Gordon & Hans Vikoler

The Greater Horn of Africa (HoA) has been increasingly affected by recurring droughts and flooding since the beginning of the new millennium. The most recent of these events was the HoA crisis in 2008/2009, which affected over 21 million people in this region.

Traditional livelihoods in the HoA have developed over centuries allowing households to adapt to specific environments; and a key factor in determining these livelihoods is the climate regime within which a household is located. Historically, the HoA has been affected by a major drought every 10 years. Although destructive, the ensuing interval allowed farmers, agro-pastoralists and pastoralists to recover and develop resilience for the next event. However, since the end of the 20th century, more pronounced climate variability has meant the increasing frequency of droughts and flooding, eroding household recovery and resilience.

In the Greater HoA, vulnerable and food insecure communities/households in partnership with the World Food Programme, government and non-government organisations, engage in food for asset activities that develop livelihood assets. These include irrigation ditches; rainwater harvesting weirs; water catchment points; and hill slope recovery and stabilization. These assets strengthen household and community resilience to the recurrent climate related shocks, which are likely to further intensify in the coming decades.

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Building an independent participatory monitoring process for climate adaptation and disaster risk reduction

by Marcus Oxley

Bridging the gap between international and national policy aspirations and the realities of policy execution at the local level is the greatest challenge to building resilient communities. It requires an impartial local-level policy monitoring process that can deliver the following:

- **An independent overview of progress at the local level**
- **A credible evidence-base to link policy and practice**
- **Local baselines to measure future progress**
- **Strengthened public accountability for policy execution**
- **Open political space for policy dialogue between different stakeholders**
- **Consensus and trust between actors (social capital)**
- **Increased awareness and understanding of policy and practice**
- **Increased "social demand" for appropriate resilience building**
- **Increased transparency and domestic accountability (increases political commitment) and**
- **Enhanced local research, analytical, monitoring and advocacy capacities.**

Recent experiences gained in local monitoring of national risk reduction policies are of direct relevance to building climate-resilience given that there is close convergence of these issues at the household level.

Vulnerability/capacity assessments with local people

Accordingly, in the next phase it should be possible to bring together a truly global alliance of disaster risk reduction, environmental and development civil society organisations in a collaborative venture.

This could provide a means to impartially measure progress towards building the resilience of communities that would serve to connect measurable outputs and outcomes at sub-national level, with measurable inputs at the national and international levels ahead of the 2012 post-Kyoto agreement.

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Climate-smart disaster risk management: the Strengthening Climate Resilience and Africa Climate Change Resilience Alliance Programme of work

by Katie Harris, Alemayehu Konde, Mohamed Adow & Alphonce Katunzi

The Strengthening Climate Resilience (SCR) project, in partnership with the African Climate Change Resilience Alliance (ACCRA), seeks to increase resilience to climate change amongst vulnerable people by enhancing the ability of governments and civil society organisations to manage disaster risk and uncertainties more effectively. The two consortia are working together to develop a framework which will allow them to assess and collect evidence of where disaster risk management interventions contribute to climate resilience, before going on to use this evidence to advocate for changes in practice and policy. In this context, the framework will identify characteristics and indicators of climate-smart disaster risk management, while bearing in mind the following question: what do disaster risk managers, linked practitioners and policy-makers working across all development sectors need to do differently considering the impacts of climate change?

As a first step, the project has begun to develop the concept of 'climate-smart disaster risk management', and the ACCRA consortia will be looking at a range of disaster risk management and development interventions used with communities and by governments and civil society organisations to see what can be inferred about climate resilience. Both consortia are working in East Africa through a number of partner agencies.

Both the SCR and ACCRA programmes will be conducting field research, holding consultations and knowledge-sharing events to identify an evidence-base of policies, projects and programmes that highlight the benefits and trade-offs involved with integrating climate change adaptation, disaster risk management and other development approaches.

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How communities are preparing to face the challenges of climate risk and disaster risk
by Provash Mondal

Vietnam is highly vulnerable to climate change and is regularly affected by disasters, especially typhoons, floods and landslides. Oxfam is facilitating community-based adaptation and risk reduction activities in the most vulnerable provinces to sea-level rise, warmer temperatures, unpredicted rain and disasters.

People are working together to develop community-based adaptation plans using Participatory Capacity and Vulnerability Analysis tools, and methodologies to adapt to the new challenges of climate change and related disasters. They have identified specific measures for improving vulnerable livelihoods by introducing disaster and salinity resistant crops, extension services, early warning systems, water supply systems, improving public health knowledge, as well as empowering women through improving income generation and community forestation activities.

Communities are in the process of improving their capacities to respond to the emergencies and live with adverse climate by participating in Information Education and Communication (IEC) events, and training courses on early warning, swimming,

rescue and evacuation, contingency planning, monitoring and evaluation, gender and humanitarian issues, standards and accountability, and humanitarian needs assessment.

Many disaster prone communities are capable of preparing themselves to live with disasters. Oxfam's experiences have been considered to improve the local governments' disaster risk reduction and adaptation plans.

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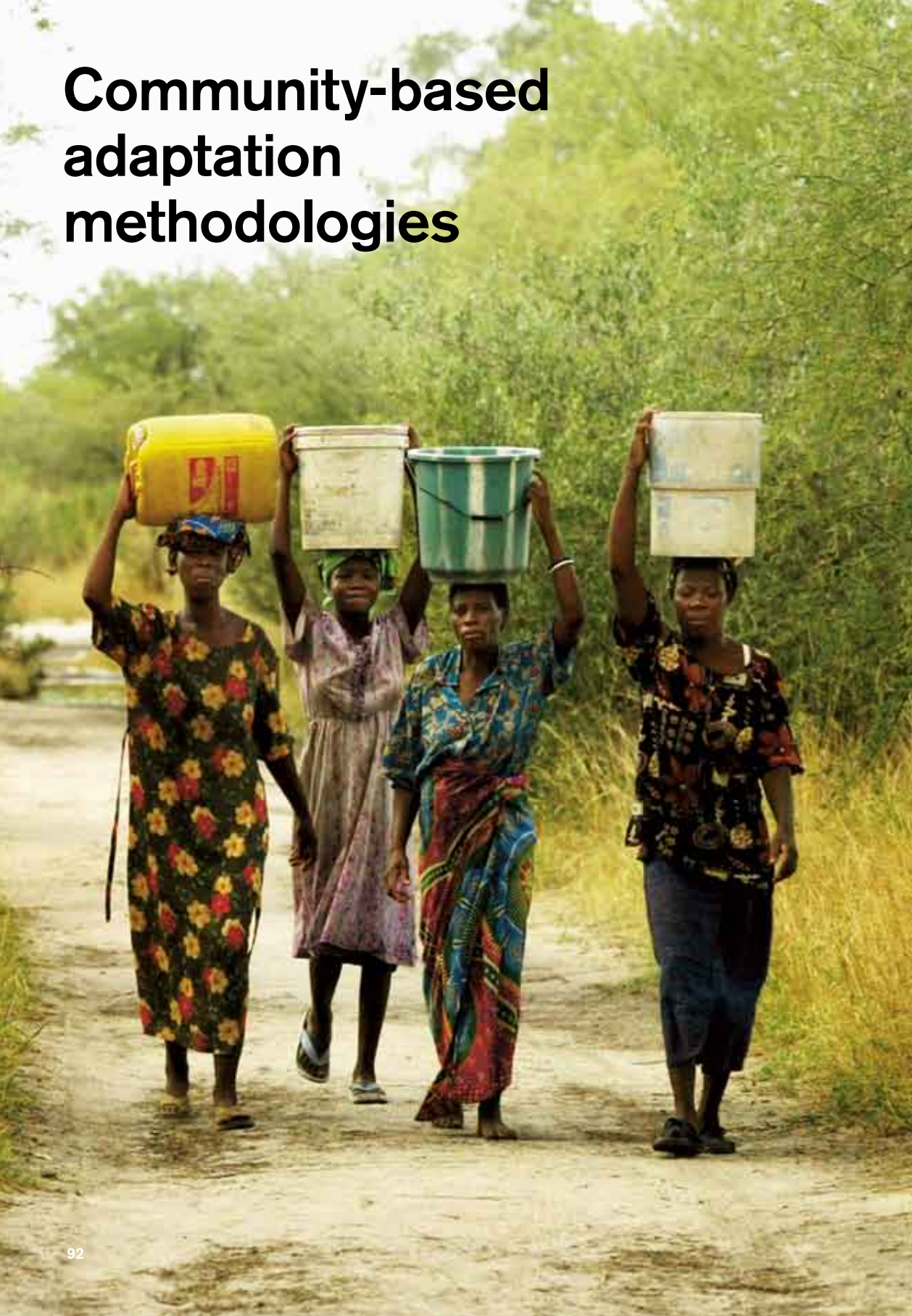
Community-based adaptation methodologies



Climate change and environmental degradation risk and adaptation assessment: a new tool for climate risk assessment and adaptation

by Oenone Chadburn

Climate change and Environmental Degradation Risk and Adaptation Assessment (CEDRA) is an environmental field tool for agencies working in developing countries. It helps agencies working in developing countries to access and understand the science of climate change and environmental degradation, and compare this with local community experience of environmental change. It is a logical guide to finding out what climate change projections exist for a specific country or district; reviewing the resilience of programmes of work across all sectors; and deciding, in consultation with a sample of communities, how to adjust the programmes in order to make them more resilient to climate and environmental change.

Using CEDRA, civil society organisations can prioritise which environmental hazards may pose a risk to their existing project locations, thus enabling them to make decisions to adapt some projects, stop doing some projects, or start new ones. Adaptation options are discussed, and decision-making tools are provided to help organisations plan their responses to the hazards identified. Non-government organisations working in disaster disk reduction as well as general development NGOs will find CEDRA useful. CEDRA is designed, ideally, to be used by people who are experienced in planning and managing development projects. This is a tool endorsed by the United States Agency for International Development (USAID) and a number of other international aid agencies.

Diverse planting in Ethiopia

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The impacts of climate change and possible adaptation activities: a case study in the Lower Rufiji, Tanzania

by Alfei Daniel, Jessica Campese & Doyi Mazenzele

Lower Rufiji is exposed to the impacts of climate change: floods, droughts and strong winds are the main climate hazards. The livelihoods include farming, fishing and beekeeping. Livelihood resources, especially natural resources (like land, water, forests, etc) are severely impacted by these hazards.

A climate change vulnerability assessment was undertaken in four villages of lower Rufiji (Nyamwage, Nyamwimbe, Nyaminywili and Mtanzamsona), using the community-based Risk Screening Tool-Adaptations and Livelihoods. During the assessment, community representatives identified some coping strategies that are used for climate change hazards. They included gathering and eating wild fruits and roots, water rationing, supplementary feed to bees, temporary settlements, use of traditional medicine, water rationing, income diversification, etc. However, most of the strategies had limited success or were not sustainable in the face of long-term climate change impacts. This demonstrated a need to revise coping strategies into adaptation activities that are both functional and sustainable to the long-term impacts of climate change.

The list of revised coping strategies that translated into adaptation measures includes: promoting conservation farming; construction of permanent water sources; improving hygiene and sanitation; planting of trees around/along waters sources, farms and settlements; establishing an irrigation system; and entrepreneurial training. The assessment highlights the substantial time and resources needed for implementing the adaptation measures.

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Participatory forest management process: a case study from Northern Malawi
by Jando Nkhwazi

Participatory Forestry Management Planning Process allows rural communities to manage the forest resources, thus fostering ownership and sustainable utilisation. This enables communities to formulate their own by-laws and sign agreements with governments as a bond of recognition, ensuring sustainable use of forest areas.

Since 2001, Rural Foundation for Afforestation, has been working with rural communities to implement sustainable afforestation programmes. It has been observed that community ownership of the initiatives is the best way to deal with environmental problems. The research demonstrates why it is so important to involve rural communities in conservation practices, who have often been ignored during the policy-making process.

The conclusion of a Forest Management Agreement will grant the community in question the authority to license commercial forestry activities within its Village Forest Area (VFA), so long as these activities are consistent with the forest management plan. Revenues arising from the licensing of commercial forestry activities by a Village Natural Resource Management Committee will be retained by the Village Natural Resource Management Committee and disposed of in accordance with its constitution and by-laws.

Example of a map drawn by communities

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Conservation-based adaptation plans in vulnerable ecosystems of Andean-Amazon landscapes
by Luis Germán Naranjo

The Eastern Cordillera Real contains the source of the Amazon River and the headwaters of important tributaries such as the Caquetá, Putumayo, Napo, Pastaza, Santiago and Chinchipe Rivers. The communities living in these mountains are highly dependent on the provision of goods and services from the high elevation grasslands (páramos) and the cloud forests of the Andean slopes which currently face the exacerbation of major threats due to alterations of local weather brought about by regional and global climate change. Similar situations have been identified in other watersheds of the Northern Andes such as the coffee-growing mountainous region of the Quindío, Risaralda, Caldas and Tolima Provinces inhabited mostly by farming communities; and the Chiles community and the Güiza basin in Nariño Province in southern Colombia, populated by indigenous communities.

Based on participatory vulnerability assessments at the watershed scale combined with Global Information System (GIS) modelling of climate, biological and socio-economic variables at the regional scale, we estimated climate change vulnerability indexes that guided the participatory design of local and regional adaptation plans.

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Participatory video monitoring and evaluation work in Kenya and Zimbabwe through the community-based adaptation programme

by Isabelle Lemaire

Now that video tools are easily accessible and affordable, organisations have been able to cheaply, quickly and effectively communicate lessons from the field and help to share adaptation strategies. Community-based adaptation videos aim to spread these adaptation stories across communities, organisations and nations. The template ensures that the necessary information is told within each film, and that their production remains accessible to most organisations.

It is not easy to gauge and communicate the effect that a programme has had on the lives of beneficiaries. Those best positioned to explore and convey these messages are the beneficiaries themselves – they are trusted sources and can speak about first-hand impacts and outcomes. For this reason, Participatory Video adds value, encourages iterative learning, and explores qualitative data often missed through traditional Monitoring and Evaluations (M&E) methods.

Participatory Video M&E pilot projects in Kenya and Zimbabwe

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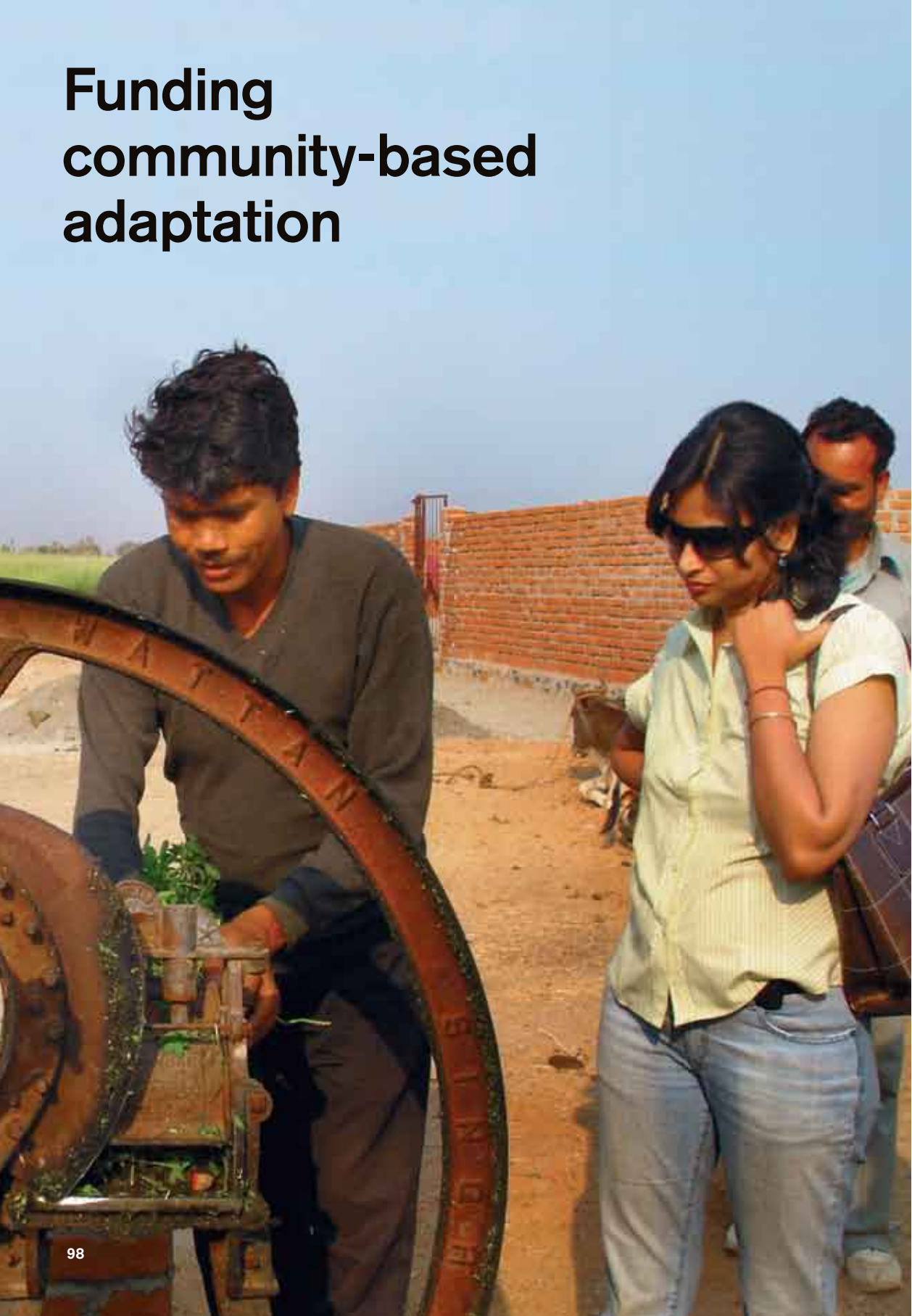
Funding community-based adaptation



Making the Adaptation Fund work for the most vulnerable
by Sven Harmeling

For many of the world's poorer countries, adaptation to climate change is now an essential priority rather than an option. This paper aims to establish the link between community-based adaptation and the development of the Adaptation Fund under the Kyoto Protocol.

Unlike many other funds such as the Least Developed Countries Fund and the Special Climate Change Fund under the United Nations (UN) Framework Convention on Climate Change, the Adaptation Fund falls under the Kyoto Protocol. Some of the unique features of the fund include direct access, which aims to simplify and accelerate the process by which resources for adaptation flow to developing countries. There is majority representation from developing countries in order to address the issue of ownership. It also has an innovative funding mechanism whereby fund revenues are obtained primarily from a 2% share in the proceeds from the Kyoto Protocol's Clean Development Mechanism project activities. And lastly, a focus on the most vulnerable communities with transparent policies.

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Lessons and future outlook from the United Nations Development Programme
by Delfin Ganapin

The United Nations Development Programme has been running and testing methodologies for effective community-based adaptation for many years through the Small Grants Programme (SGP). In the last 21 months, there has been the systematic piloting of Global Empowerment Facility (GEF) - supported CBA projects in ten countries.

Last year the SGP also launched a Mekong and Asia-Pacific CBA Programme with AusAID support. Lessons arising from these programs that include: effective measures for increasing the adaptive capacities of communities; influencing national policies; networking amongst member countries and practitioners; sharing and replication of knowledge and good practices globally, will be shared. The Vulnerability Reduction Assessment methodology, project development and approval processes, monitoring and evaluation scheme will be discussed and their potential replication by other partners explored.

Current programmatic achievements, networks and knowledge products already in use will be highlighted. Gender mainstreaming activities and practices using successful case studies across regions

CBA Programme with AusAID in Mekong

will also be discussed and materials shared. Further, plans of the United Nations Development Programme focusing on scaling up financial support for CBA including a Global Partnership on CBA involving United Nations agencies and civil society with support from the private sector and foundations will be presented.

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The UK's Department for International Development support for adaptation to climate change

by Andrew Clayton

The UK's Department for International Development (DFID) offers strong support for adaptation to climate change at a national level. Activities include resourcing and capacity building for national governments, as well as DFID mechanisms for supporting civil society. This paper will reflect on lessons for adaptation from DFID's experiences in sustainable livelihoods, Disaster Risk Reduction (DRR) and social protection. The work will also highlight some of the key challenges for DFID in providing more effective support to community-based adaptation and our lessons learned.

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Photography: The images used to illustrate the various abstracts in this publication, were all sourced from the original CBA presentaions. All other images were supplied by friends and associates of IIED.

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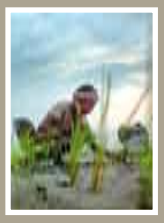
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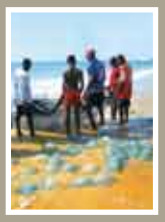
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Other IIED climate change publications

Assessing the costs of adaptation to climate change: A critique of the UNFCCC estimates

Martin Parry, Nigel Arnell, Pam Berry, David Dodman, Samuel Fankhauser, Chris Hope, Sari Kovats, Robert Nicholls, David Sattherwaite, Richard Tiffin, Tim Wheeler

This book takes another look at the costs of adapting to climate change. The estimates for 2030 used by the UN Framework Convention on Climate Change are likelyto be substantial underestimates. The authors press the case that there is an urgent need for more detailed assessments of these costs, including case studies of costs of adaptation in specific places and sectors. This report aims to demonstrate the need for the further and transparent refinement of cost estimates for responding to climate change.

2009, ISBN 978-1-84369-745-9, 111pp, US$40.00
Order No.15516IIED

Climate change adaptation in developing countries: issues and perspectives for economic analysis

Muyeye Chambwera, Jesper Stage

This paper is intended to provide some guidance to the policy-oriented researchers' work on valuing climate change adaptation in developing countries. The objective of this paper is to develop a framework for analysing the costs and benefits of climate change adaptation in developing countries and the specific contexts in which these could be applied in potential IIED work on the economics of adaptation.

2010, ISBN 978-1-84369-775-6, 40pp, US$20.00
Order No. 15517IIED

Development and Climate. A collection of short films

This DVD showcases a selection of films screened during the Development and Climate Film Festival at the UNFCCC COP in Copenhagen, December 2009. The film festival provides a platform for amateur and independent filmmakers from around the world to showcase short films on issues relating to climate change. They raise awareness, share ideas, and convey important messages in a creative and engaging way. The films cover topics such as adaptation, impacts, REDD, and technology - across Africa, Asia and South America.

2010, Free, Order No. 10025IIED, email: newbooks@iied.org

Other worlds are possible Human progress in an age of climate change

Andrew Simms, Victoria Johnson, Michael Edwards, Working group on Climate Change and Development

Other Worlds are Possible describes how the costs and benefits of global economic growth have been unfairly distributed, with those on lowest incomes getting the fewest benefits and paying the highest costs. A wide range of examples of more positive approaches are given from the wide, practical experience of the agencies in the coalition. Altogether they paint a picture of more qualitative development that is not dependent on further global over-consumption by the already rich, in the hope that crumbs of poverty alleviation are perhaps passed to those at the bottom of the income pile.

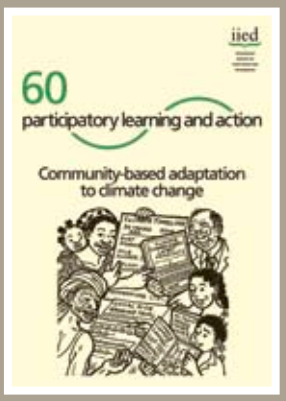
2009, ISBN 978-1-904882 67 1, 64pp, US$20.00, Order No. 10022IIED

Where does the carbon footprint fall? Developing a carbon map of food production

Katharina Plassmann, Gareth Edwards-Jones

The concept of local food is appealing to many consumers. But it is difficult to define what actually constitutes local food. Given the globalised nature of agricultural markets, bread baked in a small village bakery in England may be made from grain grown in Canada. This report advances the discussion about defining the local by examining the geographical location of greenhouse gas emissions along the supply chains upstream of two case study farms in the UK. The resulting carbon map illustrates the amount and location of the GHG emissions related to the provision of inputs and on-farm processes, and enables characterization of the 'localness' of the two farm systems.

2009, ISBN 978-1-84369-751-0, 41pp, US$15.00, Order No. 16023IIED



Community-based adaptation to climate change

Hannah Reid, Mozaharul Alam, Rachel Berger, Terry Cannon, Angela Milligan

This special issue of *Participatory Learning and Action* (PLA 60) focuses on community-based, participatory approaches to climate change adaptation which build on the priorities, knowledge, and capacities of local people. It discusses how community-based approaches to climate change have emerged, and the similarities and differences between community-based adaptation (CBA) and other participatory development and disaster risk reduction approaches. It highlights innovative participatory methods which are developing to help communities analyse the causes and effects of climate change, integrate scientific and community knowledge of climate change, and plan adaptation measures. Whilst CBA is a relatively new field, some lessons and challenges are beginning to emerge, including how to integrate disaster risk reduction, livelihoods and climate change adaptation work, climate change knowledge gaps, issues around the type and quality of participation, and the need for policies and institutions that support CBA.

2009, ISBN 978-1-84369-729-9, 224pp, US $32.00
Order No. 14573IIED
Free download at - http://pubs.iied.org/14573IIED.html
Also available in Arabic at - http://pubs.iied.org/G02730.html

Sponsors of the Fourth International Conference on Community-based Adaptation 2010

The Climate Change Group at the International Institute for Environment and Development has been leading the field on issues relating to adaptation to climate change since its inception as a discrete programme in 2001. Climate change disproportionately affects the poorest people in the world, who not only have the least capacity to respond and adapt to its impacts, but are historically the least responsible for its causes. In conjunction with partner organisations in industrialised and poor nations, the group seeks to improve the lives of the poorest communities in developing countries who are exposed to increasingly severe and unpredictable weather events that can devastate communities, destroy livelihoods and exacerbate poverty.

The International Institute for Environment and Development is a global leader in sustainable development. As an independent international research organisation, we are specialists in linking local to global. In Africa, Asia, the Caribbean, Central and South America, the Middle East and the Pacific, we work with some of the world's most vulnerable people to ensure they have a say in the policy arenas that most closely affect them — from village councils to international conventions. Through close collaboration with partners at the grassroots, we make our research and advocacy relevant to their needs and alive to their realities.

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