



**Panel 1: Community Led Responses – From local to global  
(Sponsored by AfricaAdapt)**

**Chair: Fatima Denton (IDRC)**

**Barrack Okaba:** Disentangling vulnerabilities: a participatory assessment of priorities for climate change adaptation among smallholders in Kenya

**Fiona Percy:** Community based adaptation for local empowerment and global influence: methods and practice from the Adaptation Learning Programme for Africa

**Hindou Oumarou Ibrahim:** Indigenous knowledge and climate change: adaptation of nomadic pastoralists in Chad (French)

**Yohannes GebreMichael:** Participatory climate-change adaptation building on local innovation

## Panel Summary

Dr. Fatima Denton, who leads [IDRC's](#) research on adaptation strategies in Africa, chaired this session. Fatima opened the discussion noting the value of community knowledge and how it should be used as a foundation for developing suitable and sustainable adaptation strategies that are resilient to climate shocks and stresses.

### What's a priority among Kenyan farmers around climate adaptation?

How can experiences captured from local community members in narrative form inform and influence policy makers? Barrack Okoba from the [Kenya Agriculture Research Institute](#) presented a project on just that.

Community level climate change impacts are generally not experienced in isolation from other challenges. Using participatory approaches, both male and female farmers were separately engaged in 5 districts across Kenya to elicit local perceptions of climate change including priorities for adaptations, and resources needed to adapt.

Using a scoring/ranking system, farmers could share their priorities for adaptation and fears and concerns. For example the need for irrigation and water infrastructure was considered a priority by both sexes. One fear noted, especially by men, was poverty and the lack of resources. Barrack emphasised that farm-centered, community-led responses must be complemented by policy support that address vulnerabilities.

### Community based adaptation: empowering whom and influencing what?

Fiona Percy from [Care International](#) presented the [Adaptation Learning Programme \(ALP\)](#) for Africa on community based adaptation for local empowerment. This programme is being run in 4 countries - Niger, Kenya, Mozambique and Ghana - and aims to help sub Saharan Africans adapt to the impacts of climate change, and contribute to global learning and policy processes about adaptation.

4 emerging areas of learning were identified from the programme:

- Climate change communication – including combining local knowledge with scientific knowledge
- Community ownership - developing successful adaptation strategies and increasing ongoing adaptive capacities
- Integrating gender equality and women's empowerment - promoting gender-equitable adaptation strategies with participation of both women and men
- Linking local evidence to national strategies and global policy - creating a space for exchange and learning between different adaptation actors.

### Pastoralists: surviving the brunt of climate change

Pastoralists who are completely reliant on natural resources are facing very hard challenges including water scarcity, irregular rainfall, deforestation and desertification. Hindou Oumarou

Ibrahim who is based at AFPAT, an association of M'bororo nomadic women in Chad, talked about Indigenous knowledge and climate change, with a focus on adaptation of nomadic pastoralists in Chad.

With the pastoralists moving to where the water is, the regional transboundary water resource of Lake Chad is a vital resource for agricultural production and livestock management for communities in the area. Lake Chad has seen a massive reduction in its size over the past 40 years, deeply affecting communities in Chad, Nigeria, Cameroon and Niger. Traditionally settled communities have also been displaced by the shrinking lake resource, which has led to a resource conflict between pastoralists and settled groups.

Hindou noted how these affected communities can be helped by reducing their miles of displacement (some pastoralists have had to move as far as 700km). Tools such as participatory maps and google maps are helping communities to locate natural resources in the area. These tools can be enhanced by integrating local/indigenous knowledge of the communities in the area, so that adaptive strategies can be further strengthened.

#### The value of local innovation in building community resilience

With up to 40 million pastoralists across the African region, each pastoralist has to be an innovator to some degree to adapt to climate variability. Yohannes GebreMichael, from Addis Ababa University, discussed how participatory climate change adaptation can be built on local innovation.

Yohannes asserted that local innovation needs to be recognised, as it provides an entry point for communities with a bottom-up approach to support climate-change adaptation, starting with local capacities and ideas. This can lead to local innovation having an equal participation in formal research and development activities. Of course, local innovation to climate change adaptation needs to be assessed together with other environmental, socio-economic and policy changes. Yohannes further noted that the focus should not be so much on specific innovations, but rather on documenting local innovation as a process.

#### The complexity of science

One theme that came out strongly during the Q&A session was the problem of available and accessible climate change science knowledge for communities. One panelist asked the floor whether we, as development practitioners and researchers, know enough ourselves to make community decisions. How can scientific definitions be made more available in local languages? It was strongly emphasised that indigenous/local knowledge should not be left out of the equation. Indigenous knowledge can be validated by scientists, which in turn can enhance the science being used and decisions implemented on the ground.

# Barrack Okaba

Roncoli, Carla (Emory University), Barrack Okaba (KARI)

Claudia Ringler (IFPRI), Elizabeth Bryan (IFPRI)

*Disentangling vulnerabilities: a participatory assessment of priorities  
for climate change adaptation among smallholders in Kenya.*

AfricaAdapt Climate Change Symposium 2011

Linking Climate Research, Policy and Practice for African-led Development

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In African rural communities, climate impacts are not experienced in isolation from other uncertainties and imbalances. This calls for pluralistic, iterative, and participatory research approaches that can elucidate the place-based lived experience of vulnerable people. However, when local voices are elicited through ethnographic methods and expressed in narrative form, they often fail to reach and affect policy makers. The findings presented in this paper represent an effort to produce “participatory numbers” by combining qualitative and quantitative analysis of information generated in the context of a community-based assessment with the goal of informing adaptation policy.

The participatory research was part of a composite study, funded by the World Bank and coordinated by the International Food Policy Research Institute aimed to understand climate change adaptation priorities among smallholder farmers of Kenya. In addition to the participatory assessment, the study design included a stakeholder forum, a household survey, and a survey of community-level conditions and infrastructure. The research sites were selected in 5 districts of Kenya, representing different agro-ecological areas, including arid/semi-arid areas and humid/semi-humid areas.

The assessment consisted of facilitated discussions with male and female producer groups (including a total of 69 men and 71 women) in 5 communities. Participants were engaged in brainstorming and free-listing of issues and ideas relative to several categories: indicators, causes, and impacts of climate change, adaptations and resources needed for those

adaptations, and other concerns (“worries”) they had besides climate. The free-listed items were written on a flipchart (in each group, each item was listed only once, regardless of how many people mentioned it), and then transcribed and coded into an Excel spreadsheet. The analysis focuses on the occurrence of codes in the overall database for each category, providing an approximate measure of salience. In addition, participants were given six stickers each and asked to score the elicited adaptation priorities and other concerns. The top three scored items for each group were selected and their scores totaled. This resulted in a ranking of priorities and concerns for men and women and for different agro-ecological areas.

Awareness of climatic changes was found to be widespread, particularly in relation to changes in precipitation patterns. In elucidating impacts of climate change, participants stressed the intersections of drivers and effects, across the multiple dimensions of agricultural production, livelihood diversification, environmental conservation, water availability and quality, health and nutritional status, and social stability and security. For example, they explained that drought exacerbates intra- and inter-community conflicts over natural resources and that the resulting lack of money to engage in productive activities leads to idleness, drunkenness, and domestic violence. In one site, poverty was said to force youth to migrate to towns and women to engage in commercial sex, resulting in HIV infection. Across sites, climate impacts were seen as responsible for higher incidence of disease, inducing families had to spend money on treatment rather than school fees, which in turn perpetuated illiteracy and poverty. Human health impacts were relatively more salient in humid/semi-humid areas, while impacts on livestock issues were prominent in arid/semi-arid areas. Agricultural impacts dominated among the climate change impacts mentioned by women.

Changing planting decisions dominated the adaptations mentioned by women of both agro-ecological zones. Agro-forestry was prominent in humid/semi-humid areas, while institutional solutions (government aid, group formation and participation) were relatively more salient arid/semi-arid areas. As also evidenced by other studies of adaptation in rural Africa, livelihood diversification emerged as a significant strategy across genders and zones. However, the broader context of uncertainties and tensions was said to undermine adaptive efforts. In some communities, travel and trade were constrained by the threat of banditry and delays caused by road blocks. Livestock trekking over long distances in search of water and pasture was seized by cattle rustlers or hit by speeding vehicles carrying illicit goods. Women who ventured beyond village boundaries to collect water and fodder were said to be vulnerable to sexual assaults. Institutional and governance issues were also identified as impediments: for example, farmers sought to adjust to drought by purchasing new (short-cycle) seed varieties or chemical inputs, but poor enforcement of quality standards and market regulations meant that the content of packaged goods did not always correspond to what was indicated on the label. Furthermore, access to services, subsidized inputs, and emergency relief was reportedly biased in favor of those who could bribe officials in charge. Entrepreneurial initiatives were said to be sometimes defeated by market cartels and fraudulent schemes, particularly affecting women.

Group-based efforts to secure credit, market produce, and implement adaptive technologies were also hampered by lack of trust across and within communities.

The ranking of priorities for adaptation illustrates the synergies between technical and institutional supports. Water infrastructure (for irrigation and domestic use) emerged as an overwhelming priority across genders and zones, having direct linkages to livelihood and health goals. But capacity building (including adult literacy, technical training, information access, and organizational support) ranked almost as high, especially for men in arid/semi-arid areas. Credit was prominent, particularly for men in humid/semi-humid areas, while women were weary of micro-credit, because of experiences with predatory lending and confiscation of household assets. Rather than credit, women favored better market access. Among “worries”, lack of money, lack of water, and poor health were among the top ranked, though poor governance and insecurity were also prominent, especially among men of arid/semi-arid areas. They pointed to the need to ensure accountability and transparency in public services, stricter regulation of marketing and credit, and greater public safety.

These findings reiterate the now well recognized notion that vulnerability is a complex, context-dependent dimension that integrates multiple threats and stresses, which magnify or mitigate climate change impacts. This means that community-led responses need to be supported by policy supports that address the systemic interaction of threats and shocks related to climate, environment, health, market, politics, and security, taking into account the regional and gender specificities that shape experiences of vulnerability and capacities for adaptation. Strategies centered on farm-level experimentation and community-based innovation must be complemented by broader efforts to build human and social capital and promote good governance and citizenship at various levels.

# Fiona Percy



## CARE International Adaptation Learning Programme

### **Community-Based Adaptation for local empowerment and global influence: methods and practice from the Adaptation Learning Programme for Africa.**

Paper presented at Africa Adapt Symposium, March 2011

**Topic: Linking Climate Research, Policy and Practice for African-led Development: New thinking on community-led responses: from local to global.**

#### **The Adaptation Learning Programme for Africa**

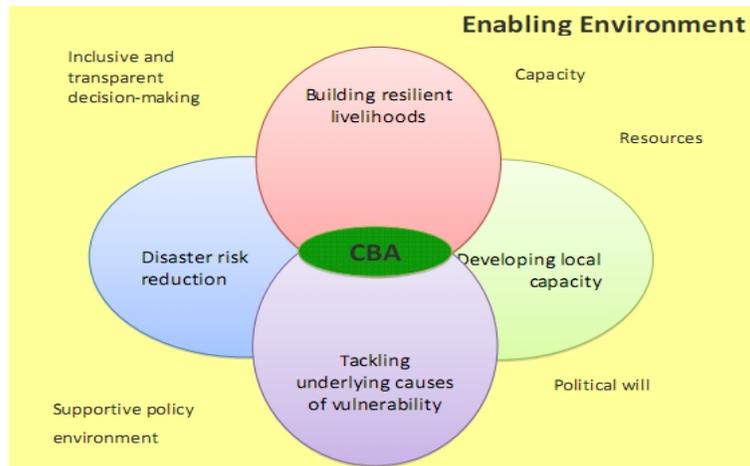
CARE International commenced implementation of the Adaptation Learning Programme in Africa (ALP) in May 2010. The five-year programme is being implemented in Ghana, Niger, Kenya and Mozambique with a goal to increase capacity of vulnerable households in Sub-Saharan Africa to adapt to climate variability and change. The programme seeks to identify successful approaches to Community-Based Adaptation for vulnerable communities and support incorporation of these approaches into development policies and programmes in the four countries and their regions in Africa. It does this through five outputs:

1. Develop and apply innovative approaches to Community-Based Adaptation to generate lessons and good practice models;
2. Empower local communities and civil society organisations to strengthen their voice in decision-making on adaptation;
3. Promote good practice models for CBA among adaptation practitioners and in local development planning;
4. Influence adaptation policies and plans at national, regional and international levels to respond to the differential vulnerability of poor and marginalised people in particular rural women;
5. Support learning networks and disseminate results and lessons globally.

#### **CARE International Community Based Adaptation (CBA) Framework**

The Adaptation Learning Programme is using CARE International's framework for Community-Based Adaptation. The framework provides a holistic analytical approach for communities to

plan adaptation actions that are informed by climate science and local observation of climate change. This approach recognizes that four key elements are required for successful adaptation at community level, each of which is informed by climate analysis and planning and the national policy context.



The four elements for successful adaptation are: 1) promotion of climate-resilient livelihoods strategies such as diversification of land use and incomes; 2) disaster risk reduction strategies to reduce impacts of increasing climate-related natural disasters on vulnerable households; 3) strengthening capacity in a) community adaptive capacity such as in access to climate information and managing risk and uncertainty and b) local civil society and governmental institutions to better support communities in adaptation efforts; and lastly, 4) local and national level empowerment, advocacy and social mobilization to: a) address the underlying causes of vulnerability, such as poor governance, gender-based inequality over resource use, or limited access to basic services, and b) influence the policy and enabling environment.

The approach places particular emphasis on understanding and addressing the differential vulnerability of poor rural women. It focuses on community owned and gendered analysis for adaptation planning and linking communities to climate information and services they need.

CARE has compiled a variety of methods and tools for facilitating CBA in a CBA toolkit<sup>1</sup>. Using these tools, in particular the Climate Vulnerability and Capacity Assessment (CVCA) handbook for initial analysis, the ALP teams (CARE and local partners) are in the process of training and facilitating CBA in a small number of vulnerable communities in each of the four countries across a range of agro-ecological zones and climates. Through close monitoring of the process and taking experiences from its own work and from other community adaptation initiatives by Civil Society Organisations (CSO) and government in the four countries, ALP aims to contribute knowledge for CBA practice and policy in Africa. Thus ALP will generate lessons and disseminate good practices for CBA as well as grassroots evidence to advocate for enabling policy environments in Africa and beyond.

<sup>1</sup> CARE Intl. CBA tool kit [www.careclimatechange.org/toolkits](http://www.careclimatechange.org/toolkits)

## **ALP Experiences and lessons to date**

### ***1. Community ownership through participatory CBA with parallel and phased interventions***

A staggered approach to support for CBA allows for communities to make their own decisions and take ownership of adaptation plans made. Communities usually prioritise livelihood interventions with relatively immediate gains. For example they may include access to new opportunities or skills in sustainable production or market and value chain information. Support to these as a first step will build community confidence and interest in continuing to develop their adaptive capacity. With some quick wins underway, further analysis and planning of interventions can follow, relating to more long term sustainable and environmentally sound livelihood and disaster risk reduction (DRR) actions. The analysis will also produce needs for adaptive capacity building and identifying and addressing underlying causes of vulnerability. This staggered approach enables communities to benefit quickly and to see the value of investing their time in participatory and rights-based approaches to developing long-term adaptation responses which will enable them to continue to adapt as the climate continues to change. It involves building community capacity and systems to access climate information; analyse their own vulnerabilities, risks, capacities and opportunities in the context of climate projections; and plan for adaptation interventions.

When ALP started in Niger, communities in the drought prone project area of Dakoro quickly prioritized early maturing varieties of millet and cowpeas as a key food security strategy, before climate analysis was completed. The ALP team members in Niger were concerned that this was too quick a decision. They wanted to complete and deepen the analysis to ensure adaptation interventions were prioritized based on knowledge of projected climate impacts and also related underlying causes of vulnerability to climate change. However, for the communities it was important to take advantage of the growing season and gain early successes in concrete livelihood terms, which would also build their confidence in their ability to adapt and build relations and trust in ALP. ALP in Niger therefore supported the communities to select farmers to pilot the new crop varieties, gain skills in correct practices, and plan for distribution of seed across the communities in the following seasons. This was done in parallel with continued CVCA and risk analysis which led to community adaptation action plans with a range of livelihood interventions. These plans are now being assessed for their feasibility in relation to climate projections, economic viability, gender equity and environmental sustainability to arrive at a priority list of activities – with differences for men and women recognized – to enable community planning. Meanwhile the piloted crops were a success, with an increase in yields compared to local varieties generating \$21,500 additional income to 140 farmers (including 40 women) as well as seed to distribute to other interested farmers across the communities. In Ghana, participatory focus group discussions during the CVCA alerted communities to which of

their activities expose them to higher degrees of vulnerability leading to their decision to make changes straight away. For example, the Farfar community in Garu Tempane district is now making efforts to minimize bush fires. Traditional institutions who normally inform on planting seasons agreed to work closely with ALP. These experiences demonstrate the important benefits of 'quick fix' livelihood and environmental protection interventions for adaptation.

While early activities often focus on resilient livelihoods, these are necessary but not usually sufficient for long-term adaptive capacity to climate change. The ALP team will thus continue the process of analysis with the communities and local government to plan for climate informed disaster risk reduction plans, understand adaptive capacity needs among different vulnerable groups, and identify underlying causes of vulnerability which may prevent prioritized adaptation interventions from being implemented successfully.

## ***2. Climate communication from science and local knowledge are key to successful adaptation***

The Climate Vulnerability and Capacity Assessment tool uses well-known participatory rural appraisal (PRA) methods to understand local perceptions, felt impacts and knowledge of climate change trends from the past into the present. It also captures local knowledge on past and predicted weather patterns. Local knowledge on climate often depends on human memory, and this tends to focus on extreme events in the past (e.g. prolonged droughts) while average conditions may not be properly recalled. This knowledge is a narrative especially from the older generation, with no accurate accessible record, posing a challenge for access and reference. It may be distorted by inaccurate 'macro-narratives' developed over years by outsiders. Usually, local knowledge relates to predictions for the coming season and not to long term future change. Scientific climate information, on the other hand, may have a longer record of climatic conditions in the past and ability to make future projections. However, this often relies on only few existing meteorological stations that are meant to serve a large geographical area, and which may not capture local climatic conditions. Further, scientific information is often not known, not available, or is presented in language that is not easily understood by communities and in formats/media that are not readily accessible.

These weaknesses in the two sources of information present opportunities for communities for climate change integration. A key first step is to document local climatic knowledge after cross-checking it within the community. This qualitative information can be used to contextualize the quantitative-based scientific information, by bringing out the climatic variables/events of concern and relating the local descriptions to what has been scientifically recorded. Discussion of local seasonal forecasts alongside those from meteorological institutions will help in generating community understanding and trust, and in localizing the scientific information. Such

interaction helps to shed light on what scientific information is useful to communities and how to communicate it to them effectively. This provides a basis for discussion of future climate change projections. A further step towards community adaptive capacity, confidence and change is to engage interested community members in the collection, processing and analysis of the climate ('weather') data itself. In this way farmers and pastoralists themselves create scientific data they need at the local level which can also be fed back to formal science. This enables farmers' decision making, provides essential data to all levels, and recognizes the vital role of farmers in knowledge generation. ALP will learn from the CBAA project with rooibos farmers in South Africa who are using simple techniques to record temperature and rainfall systematically.

Using the CVCA process, participatory climate analysis and participatory scenario development methods, ALP is working towards systems which allow this combination of local knowledge with scientific climate projections and seasonal forecasts. It is working with the communities and local government to design systems which support climate communication linked to existing systems, for example in the areas of disaster risk reduction and early warning. In Niger as planned with local actors, ALP is facilitating community disaster monitors, local government planners, service providers and meteorological departments to meeting in a seasonal forum to share knowledge and interpret climate and weather forecasts to support their decision making. This is combined with community radio for dissemination of agreed messages. Community descriptions of changing climate patterns in Niger tallied with analysis of meteorological records<sup>2</sup>. This builds trust and confidence among these actors to work together and to plan responses to the predictions made, especially if communities are involved in the collection of the meteorological info in the first place. Such processes and information can feed back to national meteorology departments and scientists to inform their research and analysis decisions.

Future climate change projections, however, need to be translated into useful information for adaptation. Challenges in translation of climate projections include:

- Regionally downscaled climate projections over Africa are not easily available and accessible; ALP is relying on the number of published, peer reviewed journal articles that can be found on the internet. Others may not even have resources for this;
- The number of available projections are from different sources, are produced differently and cover different time periods, making it difficult to compare them so as to develop a harmonized view of the future; and
- The generation of possible future implications in various sectors requires technical capacity (both human and infrastructure) that may not be readily available.

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<sup>2</sup> ALP Niger verbal communication and Draft Baseline Report

ALP will look for relevant research relationships to counter these challenges and to identify and support relevant institutions for sustainable translation of science into information which can be used by local governments, service providers and communities. For example in Kenya, ALP will be able to provide information from the local level to the Kenya Meteorological Department (KMD) on what information they need to inform their adaptation planning and support expansion of the existing KMD rural radio network for climate communication. In Niger, the new World Bank funded Pilot Programme for Climate Resilience (PPCR) will provide resources and expertise to create conditions which enable global climate-related research/scientific information to be linked up to community knowledge. ALP will build up on this opportunity and will contribute by building capacity for community voice and creating space for a strong contribution of community based knowledge.

### ***3. Integrating gender equity and empowerment from the start***

Many adaptation initiatives recognize that climate change has higher negative impacts on the most vulnerable groups and that these groups are often poor rural women. They also state the intention for gender equity and mainstreaming as a key principle and goal. However, methods to fully integrate gender within analysis and planning processes for adaptation are yet to be well developed beyond simple disaggregation of men and women. Identifying gender equity and rights implications of adaptation strategies at an early stage is essential to arrive at responses which support equity. This is in the form of improved participation, in equitable benefits and in strengthening women's rights regarding resources distribution and decision making. Such analysis also enables building on existing roles and knowledge of women and men which have equally important but different contributions to adaptation strategies and their implementation. ALP has generated a set of principles to guide such integration and is in the process of developing gender guidance notes for applying the principles to each step of the CBA analysis, design, and monitoring process. Experience from using the guide will inform the next versions of CARE's CVCA handbook and CBA tool kit.

Principles include:

- Promote *gender equality* as a long-term goal in all adaptation work.
- *Control over assets*. Challenge the distribution and control of resources and allocation of duties between women and men. Encourage critical awareness among women and men of gender roles and norms and build on their existing knowledge and capacities.
- *Gender and differential vulnerability analysis*: Plan adaptation initiatives based on a comprehensive, participatory and gender-sensitive analysis of vulnerability to climate change, with the participation of both women and men, including the most vulnerable groups in the community. Recognise differential vulnerability within countries, communities and households and target adaptation strategies accordingly. Promote adaptation policies and programmes at local, national and international levels that meet the specific needs of

vulnerable women and men and which recognise the important contribution of women's roles in adapted households and communities.

- *Equitable rights*: Address power relationships between women and others in the community, such as service providers or traditional leaders.<sup>3</sup> Explicitly aim to empower vulnerable women and girls to build their adaptive capacity. Support to women and men to access the climate information, resources, rights and opportunities they need to adapt to their changing environment.

#### **4. *Linking local evidence to national strategies and global policy***

An overall goal of ALP is to influence global decisions on adaptation finance and access to funds by African countries through providing evidence of the importance and urgency of adaptation at community level. ALP works with other civil society organizations at all levels - from community experiences to local and national government and up to global policy level. ALP creates space and provides opportunities for:

1. Local and national governments and civil society to learn about and be convinced of the value of community based adaptation. Eg. through learning events where evidence of success is shared, peer reviews, visits to communities, photo/climate witness evidence at national meetings
2. Contributing convincing evidence from African communities to NGO advocacy at national, Africa regional and global level
3. Informing civil society at national level on both UNFCCC policy issues for adaptation and the value of CBA as an adaptation response and linking them to global civil society advocacy initiatives.

National governments and NGOs are often unfamiliar with realities as well as existing capacities at community level. There is a need to strengthen the growing recognition that local people have valuable knowledge to inform local responses to climate change and to demonstrate evidence for successful adaptation. Through monitoring and structured learning on what works and what does not, and sharing methods and results of CBA in a variety of ways, ALP enables local experiences from a range of CBA projects to inform knowledge and decisions on adaptation policy and plans by national networks and governments.

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<sup>3</sup> Adapted from: U.S. Agency for International Development (USAID) & International Gender Working Group (IGWG) (2009). *Gender Perspectives Improve Reproductive Health Outcomes: New Evidence* and CARE International (2008). *Gender Policy*.

For example in Niger, ALP is contributing information to influence decisions on the focus of activities to be supported by the World Bank PPCR. ALP Niger collaborated in a learning event to exchange CBA experiences between ALP, the national NAPA pilots and a GEF funded adaptation programme working in the same region. ALP is also supporting a national member association, AGIR which works at local level to develop capacity to engage in networks and policy processes at national level. In Kenya ALP is linking with an initiative to integrate adaptation into local government planning processes led by the Northern Kenya ministry for ASALs. This would link CBA processes to local planning and budgets and provide further evidence for national decision makers. In Mozambique ALP and ACCRA (Africa Climate Change Resilience Alliance) are coordinating activities at national level bringing together actors engaged in CBA to share their experiences. In Ghana, ALP shares plans with the Ministry of Environment, Science and Technology and Environment Protection Agency (EPA) including visits to CBA field sites. Through existing NGO networking in Ghana, local NGOs in Northern Ghana active in CBA are supported to share their experiences at national level. ALP will coordinate capacity building and learning events for a wide range of NGOs, networks and membership groups such as Climate Action Network Ghana and the Farmers Organization Network of Ghana. ALP has now been invited to sit on the steering committee for the Africa Adaptation Programme (AAP)<sup>4</sup> in Ghana hosted by EPA and through AAP will to support training of line ministries in CBA and requested by government to provide technical assistance for incorporation of CBA into the National Climate Change Adaptation Strategy.

CARE with other international NGOs is an active advocate at global policy level for adaptation finance to reach the most vulnerable in response to their expressed needs. Participation in INGO coordinated action at the UNFCCC COP16 in Cancun has enhanced relations with civil society activists and government delegates from specific African countries and regional groups such as the Pan African Climate Justice Alliance (PACJA) and Climate Action Network (CAN). This has led to increased engagement with national policy processes at country level after Cancun, which in turn provides an entry point for exposing policy makers to experiences and lessons emerging from the community level. For example support in speech writing by Ghanaian NGOs linked in Cancun for official Ghana delegates has led to increased participation of civil society in Ghana's own policy development processes and the opportunity to promote CBA as described above. ALP support at COP16 to the official Kenya Delegation for a more coordinated Kenyan response has led to demands by the Kenyan Climate Change Working Group (KCCWG) for ALP to be involved in national policy discussions.

The intention with these activities is to create space for exchange and learning between adaptation initiatives and among adaptation practitioners from civil society and government in order to:

- motivate interest and allow learning from community evidence to reach decision makers such that national and global adaptation funding and policies support effective community based adaptation systems

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<sup>4</sup> Africa Adaptation Programme (AAP) <http://www.undp-adaptation.org/africaprogramme/>

- enable local adaptation planning and implementation to be informed by national and global decisions and opportunities

Zouley Ibrahim with her early maturing cowpeas in Dan Maza Idi village, Bader Goula commune, Dakoro, Niger. ALP © CARE Awaiss Yahaya

Paper produced by Fiona Percy, ALP Regional Coordinator with inputs from the ALP team in particular Cynthia Awuor, Ruth Mitei, Romanus Gyang, Awaiss Yahayer, Omar Tankari, Baba Tuahiru and with editing support from Tamara Plush, Rolf Herno and Karl Deering.

# Hindou Ibrahim

## HALT AUX CHANGEMENTS CLIMATIQUES ! RECOURS AUX CONNAISSANCES TRADITIONNELLES

Les peuples autochtones sont parmi les premiers à subir directement les conséquences des changements climatiques, étant donné qu'ils dépendent de l'environnement et de ses ressources naturelles et ils ont une relation entretenue étroite avec la terre. Le changement climatique exacerbe les difficultés que déjà rencontrent les peuples autochtones vu leur vulnérabilité. Telles que la marginalisation politique, sociale et économique, la perte de leurs terres et de ressources naturelles qu'ils en dépendent, les violations de leurs droits, la discrimination sur tout le plan etc. Voilà un exemple d'un impact.

- Le changement des saisons, la hausse des températures, l'accélération de vent a un impact négatif sur les pâturages et la végétation en générale. Inondation dans certaines zones et sécheresse, insécurité alimentaire dans d'autres. Certains éleveurs peuls Mbororo autochtones du Tchad qui pratiquaient l'élevage nomade de bétail sont obligés de changer de mode de vie. De nomadisme total au semi-nomade ou sédentaire totale. Ils essayent de s'adapter d'une façon traditionnelle à faire l'agriculture mais n'arrive même pas à avoir une récolte de subsistance et tout les bétails dont ils dépendaient sont mort ou vendu par manque des quoi vivre. Les jeunes se lancent dans l'exode qui envahit les grandes villes et gonfle les nombres de chaumage. Les filles et jeunes femmes se lancent dans la prostitution qui à la fin ramène des maladies dans la communauté. Et la finalité de cette communauté est la perte de culture, mode de vie, identité et jusqu'à disparation.

Les difficultés que ces peuples autochtones rencontrent et le rôle qu'ils peuvent jouer dans la lutte contre le changement climatique sont énormes, mais, ceux-ci est rarement abordés dans les débats publics et les Instances nationale, régionale et internationale qui travaillent sur le changement climatique. Les dirigeants préfèrent parler de « Finance » qui provient des ces changement que de parler des peuples qui en souffrent et dont leur vies deviennent de plus en plus vulnérables. L'absence de leur considération dans les sphères de décisions reste encore un grand défi.

Pour temps pour leur survie à eux ils contribuent d'une façon naturelle et traditionnelle à la régénération des 'écosystèmes. Nous donnons comme exemple suivant :

- Au Tchad, les autochtones nomades (Peule Mbororo), ont des connaissances traditionnelles de déplacement qui respecte la régénération de l'écosystème d'une façon naturelle et traditionnelle et en gérant les ressources naturelles d'une façon équitable et rationnelle. Les autochtones de la forêt connaissent les arbres qui conservent l'eau et ils le protègent et à leur tour protègent d'autres arbres qui les entours.

Les changements climatiques représentent une menace et un danger pour la survie des communautés autochtones du monde entier, alors que celles-ci ne contribuent que très peu aux émissions de gaz à effet de serre. Au contraire, elles participent activement et de façon vitale à de nombreux écosystèmes sur leurs terres et territoires, et il n'est pas impossible qu'elles en améliorent la résilience. En outre, ils interprètent les changements climatiques et réagissent à leurs impacts d'une façon très créative, en s'appuyant sur les connaissances traditionnelles et d'autres technologies (comme la cartographie participative, le pistage...) pour trouver des solutions qui pourraient aider l'ensemble de la société à faire face aux changements qui est une menace mondiale.

Dans beaucoup de cas, des ressources financières supplémentaires se révèlent nécessaires pour l'adaptation à de nouvelles conditions, en mettant en place de stratégies à long terme ainsi que le mariage entre les connaissances traditionnelles et le transfert de capacités technologiques que la plupart des communautés autochtones ne possèdent pas.

Certaines mesures d'atténuation peuvent avoir des conséquences néfastes pour les communautés autochtones, que ce soit directement ou indirectement. Ainsi, les dirigeants ont tendances de développer plus des stratégies agricoles qui risquent d'avoir aussi des conséquences néfastes sur certaines communautés autochtones comme les éleveurs, les chasseurs cueillettes etc. Sert que ces initiatives agricoles permettent de réduire des émissions de gaz à effet de serre, mais elles risquent de déboucher sur une augmentation des exploitations des terres par conséquent à un déclin de la biodiversité, de la régénération des écosystèmes et de la sécurité alimentaire. La participation pleine et entière des communautés autochtones est essentielle pour l'élaboration des mesures

d'atténuation proposées par les pouvoirs publics, afin que leurs plans n'aient pas un impact négatif sur les communautés vulnérables.

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## **Participatory climate-change adaptation building on local innovation**

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### **Abstract**

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

Partners in Ethiopia, Nepal and Nigeria within the international multi-stakeholder PROLINNOVA (PROMoting Local INNOVATION) network explored the relevance of the PID (Participatory Innovation Development) approach to CCA at local level. PID involves multi-stakeholder experimentation that builds on local ideas and initiatives. The study sought primarily to document local experimentation in response to a felt need to adapt to climate change and to draw lessons on the potential influence of local innovation processes on CCA policies and programmes.

Though the initial focus was on local innovations, it soon became clear that responses to climate change involve not only new practices. The communities studied have long histories of dealing with considerable climate variability, and have developed over time what are now considered “traditional” practices to cope with extreme weather conditions. Even if climate change is not an isolated factor for these people, the study showed that their capacities to innovate to adapt to changing conditions is an important element in reducing vulnerability.

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

### **1. Introduction**

The challenge of climate change calls for action not only to try to slow down the process by reducing the effects of human activity on the global climate (mitigation) but also to assist those affected or threatened by climate change to be able to cope and adapt. Governments and international bodies are paying increased attention to measures aimed at adaptation. In most cases, these involve externally driven processes dominated by “high-tech”, exogenous and large-scale interventions. While such interventions may be needed and useful in certain parts of the developing countries, most of the adaptation efforts will ultimately have to take place at the local level. For local people who are directly suffering the results of climate change, international and macro-level policies will be meaningful only when accompanied by local, micro-level initiatives that help the local people to innovate and adapt in the face of the challenge of climate change.

In agricultural development, there is growing evidence (e.g. Reij & Waters-Bayer 2001) of how local adaptation capacities can be supported by building on the knowledge, interest and innovativeness of local actors. Known as Participatory Innovation Development (PID), this approach shows how local people together with external actors, such as researchers and non-governmental organisations (NGOs), can be effective in accelerating innovation, if the external

actors take on a facilitating rather than a leading role. Farmers (including pastoralists and other local resource users) are in the driving seat.

In 2007, some partners in the PROLINNOVA network (see Box 1) who were involved in the CCA debate began to ask themselves: How relevant is the PID approach for supporting local adaptation to climate change? Can interventions to support CCA build on local people's capacities and innovativeness? Do farmers already deliberately try to innovate, i.e. to find new ways to deal with the challenges posed by a changing climate and – if possible – even take advantage of them? What is the wider potential of the link between local innovation to adapt to climate change, on the one hand, to national policymaking related to climate change, on the other?

In 2008, the network decided to start up an exploratory study to seek answers to these questions, with funds made available by the Netherlands Directorate General for International Cooperation. This paper describes the main ideas behind the study, outlines the methodology used, presents the main findings and draws conclusions for the way forward.

### **Box 1: PROLINNOVA**

PROLINNOVA is an international learning network aimed at **Promoting Local INNOVATION**, i.e. farmer-led joint innovation processes, in ecologically oriented agriculture and natural resource management (NRM). It recognises the **dynamics** of local knowledge and seeks to enhance capacities of farmers to adjust to change – to develop their own site-appropriate systems and institutions of resource management so as to gain food security, sustain their livelihoods and safeguard the environment. The essence of sustainability lies in the capacity to adapt.

PROLINNOVA promotes approaches to agricultural and NRM development that start with discovering how farmers do informal experiments to develop and test new ideas for better use of natural resources. Understanding the rationale behind local innovation transforms how researchers and extension agents view local people. This experience stimulates interest on both sides to enter into joint action. Local ideas are further developed in a participatory process that integrates local knowledge and scientific knowledge. Joint action and analysis lead to mutual learning.

Since the network started in 2003, PROLINNOVA has grown to include more than 130 NGOs, governmental research and extension, policymakers, educational institutions and farmer organisations from 18 countries. Each country network, coordinated usually by an NGO, has developed its own set of activities within the common goal of mainstreaming farmer-led participatory innovation processes. Network members have studied numerous cases of local innovation processes, have encouraged research and development agencies to interact and support these using a participatory approach and have documented these experiences for use in policy dialogue and mainstreaming activities. An International Support Team handles network facilitation, capacity strengthening, coaching, information management, international policy dialogue and publishing.

The overall objective of the study was to explore the relevance of local adaptation and innovation and a farmer-led participatory approach to CCA at local level. More specifically, the study tried to:

- Understand local communities' perceptions of "climate change";
- Systematically document local experimentation processes that come about in response to a locally felt need to adapt to climate change;
- Stimulate documentation of local innovation processes at local level;
- Shed light on some of the factors that enable and accelerate local resilience and capacity to adapt to climate change;
- Draw lessons on potential impact/influence of local innovation processes on CCA policies and programmes.

## **2. Methodology**

The study was carried out over a period of two years from mid-2008 to mid-2010. It started with a literature review on local-level adaptation to climate change in agriculture and NRM. This review gave the PROLINNOVA partners in the country networks a brief overview of the debate on CCA and of the role of local knowledge, practices and innovations in adaptation.

The exploratory studies were carried out by three PROLINNOVA country networks:

- Ethiopia, focused on pastoral systems in arid areas;
- Nepal, focused on agriculture and NRM in mountainous areas; and
- Niger, focused on mixed-farming systems in semiarid areas.

In this paper, only the experiences in Africa are described, but the experiences in all three countries provide the basis for the lessons learnt. In Ethiopia, the work was coordinated by the Pastoralist Forum Ethiopia (PFE), a local umbrella NGO that brings together local and international NGOs dealing with pastoral development issues in Ethiopia, in close collaboration with the Geography Department of Addis Ababa University. In Niger, CRESA (*Centre Régional d'Enseignement Spécialisé en Agriculture*), a body of the Faculty of Agronomy of the University of Niamey, coordinated the work together with INRAN (*Institut National de Recherche Agronomique du Niger*). At the international level, the study was coordinated by ETC AgriCulture in the Netherlands, the host organisation of the PROLINNOVA International Secretariat.

While each country network designed its specific flow of activities, they all included in some form the following:

- Literature review of in-country work on links between climate change and local innovation;
- Quick scanning of organisations involved in CCA programmes for learning from previous experiences, potential engagement in the study and/or discussing future results;
- Actual documentation in the field, done by as many committed local organisations as possible;
- Synthesis of findings: the major findings were compiled into a report that reflected the situation and perspectives of different communities and development actors;
- Sharing findings in a national-level workshop, to which policymakers and organisations dealing directly with CCA were invited;
- Deepening of the study focused on particular area or type of innovation;
- Compilation of a final case-study report per country.

In addition to using the results for information exchange and policy influence during the actual study, the outcomes are to be used subsequently in training courses and higher education.

### **3. Findings from the case studies**

#### **3.1 Case study in Ethiopia: focus on pastoral systems in arid and semiarid areas**

The case study in Ethiopia was carried out by PFE staff members and a researcher from the Geography Department of Addis Ababa University. The focus was on innovation by pastoralists in arid and semi-arid areas. A preliminary study on pastoralist innovation to adapt to climate change was followed by an in-depth study of local innovation by Afar pastoralists.

The main aims of the preliminary study in 2008 (Yohannes & Mebratu 2009) were to scan local perceptions of climate change, to document local innovations in adapting to climate change, and to draw lessons for policy influence and global clarity of concepts. Four areas were purposely selected for the fieldwork: Awash Fentale District in Afar Region, an area of chronic conflict; Dasanach District in the Southern Region<sup>1</sup>, an area that frequently experiences flooding problems; and Gashamo District in Somali Region, an area that frequently experiences serious droughts. Villages were chosen to address different clans and subclans in the localities. A question checklist was used to guide semi-structured discussions with different groups of community members:

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<sup>1</sup> Southern Nations, Nationalities and Peoples Region (SNNPR), referred to here as the Southern Region

elders and leaders, women, men and youth. Some discussions were also held with government and NGO staff working at village, district and zonal level.

The deeper-going study on pastoralists' innovativeness in adapting to climate change was made in Awash Fentale District in Afar Region (PFE 2009). It sought to understand the process of innovation and adaptation to climate change among different groups within a pastoralist community, to identify indicators for innovativeness in CCA in a pastoralist context, to analyse how the local innovations were diffusing within the community and to draw lessons about integrating local innovation in CCA into development interventions. Focus-group discussions were held with male and female pastoralists and with elders in four communities. Data on rainfall and temperature over the past 40 years were obtained from Melka Warar Research Centre.

In pastoral areas of Ethiopia, drought is part of a normal climatic cycle and pastoralists have developed strategies to cope with it, such as mobility, livestock species diversity, reciprocity in use of resources, territorial fluidity and social safety nets. The literature review revealed that the vulnerability of pastoralists to drought is very complex and is evident in diverse forms. It is not drought itself that is making pastoralists vulnerable, but rather the increasing marginalisation of their drought-response mechanisms (Devereux 2006). Their livelihoods and the very system of pastoralism are being threatened by decreasing access to land and water resources for livestock husbandry, increasing restrictions on mobility of people and animals, intensification of conflicts and stricter control of cross-border trade (Hesse & MacGregor 2006, Yohannes & Waters-Bayer 2002). As a result of government policy for development, which is biased to arable farming, some pastoralists have settled for part or all of the year. The drought periods, combined with increasing sedentarisation and environmental degradation, have led to deterioration of pastoral livelihoods. There is widespread perception, especially among pastoralist peoples themselves, that droughts are becoming more frequent and more severe, leading to a crisis of pastoralism and concern whether their way of life and production will continue to be viable.

Changes perceived by the pastoralist communities in the study areas included population growth, more settlement, greater diversification of income sources, influx of migrants, longer dry periods, higher incidence of livestock diseases, lower availability of water sources and more conflict. The local people saw these changes as directly or indirectly linked to climate change. Their own innovations in response to what they perceived as climate change included the following:

- **Developing their own cut-and-carry feeding system:** Afar pastoralists who faced dwindling grazing resources started to collect forage from a national park (that the Government has set up in their former grazing area) and transport the forage to their livestock (see Box 2).
- **Creating private and community waterpoints:** In some parts of Somali Region of Ethiopia, man-made waterpoints in the form of in-ground cisterns (*birkas*) are increasing in number and are often privately owned. Many pastoralists sell some animals to be able to pay for water. Some communities – either on their own initiative or with the help of NGOs and government agencies – have developed communal sources of water by harvesting run-off water, digging deep wells or establishing community *birkas*.
- **Purchasing commodities on credit:** During periods of scarcity, some pastoralists have started buying different commodities on a credit basis from small shops (often set up by pastoralists) in small towns in the pastoral areas. This mutual relationship between people in the urban and rural areas serves as a new form of safety net in the face of high risks.
- **Changing herd composition:** Because of problems with water, pasture and recurrent drought, pastoralists are increasingly replacing cattle with sheep, goats and camels.
- **Settling on islands in dryland lakes:** In Southern Ethiopia close to the border to Kenya, on account of the longer dry seasons being experienced, some Dasanach agro-pastoralists now prefer to stay on islands in Lake Turkana so as to have an easy access to water, pasture and fish, and to face less risk of livestock raiding by other ethnic groups.
- **Diversifying livelihood sources:** In Southern Ethiopia, some ethnic minorities, often called hunter-gatherers, who used to depend almost solely on fishing for their own consumption, have

started selling fish and use modern fish traps they have brought in from the Turkana area in Kenya. They have also begun to rear small ruminants. This is a case of people who were originally non-pastoralists gradually tending towards more pastoralist-like activities.

- **Using motor vehicles:** In many places in Ethiopia, some richer pastoralists have sold some of their livestock in order to buy trucks, which they use in a flexible way to transport livestock for grazing or marketing and to transport marketable commodities for buying and selling. The same trucks are used to load watertanks when the truck owners need water for their own families and herds. They also generate income by transporting water to *birka* owners. As a result on these activities, the rich pastoralists are becoming even richer.
- **Empowering traditional institutions:** In Afar Region, the community underlined that the root cause of their vulnerability is closely linked to the lack of good governance in their local socio-political institutions. Their perception was that the traditional pastoral leaders have – with the attractions of modern and individualistic lifestyles – become corrupt and are no longer accountable to their communities. Accordingly, some pastoralists “elders” (married men both young and old) have built up pressure within the communities to penalise and/or overthrow corrupt leaders. They also work intensively on resolving conflicts and have sometimes successfully negotiated with other ethnic or clan groups to use resources in different geographic locations, at least temporarily during drought and on a reciprocal basis. Generally, these efforts have contributed to improving governance at the grassroots level. This reduces vulnerability of the communities to external threats, including climate-related ones.

#### **Box 2: Developing their own cut-and-carry feeding system**

Already several decades ago, the Awash National Park in Afar Region of Ethiopia took over large areas of prime grazing land and water points formerly used by Afar pastoralists. These people have gained no benefit from the income from tourism, and their herds have no official access to the park during dry seasons and droughts. Therefore, frequent violent conflicts between Afar pastoralists and park (State) authorities have taken place. Recently, however, with the increasing number of droughts, some Afar pastoralists have developed their own cut-and-carry system of collecting forage from the park and transporting the forage on the head or in carts drawn by horses or donkeys. This innovation includes collective action by community groups that rent carts jointly, using money contributed by group members, and then distribute the forage within the community. This innovative way of managing forage resources has several benefits: 1) it reduces conflict between the pastoralist community and the State; 2) the cut-and-carry system reduces the risk of disease transmission between livestock and wildlife; 3) the pastoralist community has come to regard the park as a reserve pasture area; and 4) the community has developed a collective financial management mechanism that could serve as a basis also for other economic activities.

The in-depth study in Awash Fentale District, Afar Region, brought evidence of increasing climate variability and a decreasing trend in amount of rainfall. This led to poor regeneration of pasture and shortage of water, which led, in turn, to more frequent drought-related shocks and greater vulnerability of the pastoralists. Because of the series of droughts in recent years, the households had more limited opportunity than usual to rebuild their assets – particularly in terms of livestock – and some became locked into a spiral of chronic food insecurity and poverty. However, other Afar households were found to be adapting to the changes in a creative way. The study confirmed the importance of traditional pastoral strategies such as flexibility in terms of herd mobility, managing herd structure, herd splitting, managing household labour resources and managing grazing reserves in giving pastoralists some degree of resilience to climate change – as long as they were able to continue with these strategies. Specific new responses to recent changes included:

- Diversification of income sources, including crop cultivation and engagement of some Afar pastoral family members in wage labour on large commercial farms that have been set up in former grazing areas;
- Sending at least one if not more of the children in the family to school in an effort to reduce the risks of future shocks, including climate shocks;

- Reviving the use of traditional house-construction materials (wood, palm leaves, mud) and style (with a flat mud roof) to replace the recently introduced corrugated iron roofs, which become too warm with the perceived increase in temperatures;
- Merging of “modern” and traditional systems of conflict management, in the face of greater volatility of relations among pastoralist groups with increasing incidence of drought;
- The cut-and-carry feeding system mentioned in Box 2.

The main motivations for the innovation were to provide food for family consumption, to increase the household income and to supply fodder to the livestock during the dry season, with the aim to become more food-secure.

### 3.2 Case study in Niger: focus on mixed-farming systems in semiarid areas

In Niger, the study was coordinated by CRESA, part of the Faculty of Agronomy of the University of Niamey, and was implemented jointly with INRAN, two NGOs and the Directorate of Agricultural Development in Maradi Region. It was carried out in Tahoua, Illéla, Keita and Abalack Districts in Tahoua Region and in Guidan Roumdji, Dakoro and Madarounfa Districts in Maradi Region. It looked at local innovation in both mixed (crop-livestock) farming and agro-pastoralism. Full details of the study in Niger can be found in Magagi *et al* (2010).

Niger is among the fastest-growing countries in Africa in terms of population, with a growth rate of almost 3% per annum (CIA 2008). This means that many more people are using water than in the 1960s and 1970s, which would exacerbate the consequences of a drier environment.

In semi-arid Niger, innovations/adaptations that had been developed by Peul and Tuareg pastoralists to deal with perceived climate change included:

- **Changes in herd composition:** Because of problems with water, pasture and recurrent droughts, pastoralists are replacing cattle by goats, sheep and camels. Agro-pastoralists are keeping more donkeys because of their multiple functions for drawing water from deep wells, transporting water, transporting goods to and from markets and as marriage gifts (see Box 3). Moreover, donkeys are less demanding in their feeding than are other livestock.
- **Privatisation of wells:** Because water sources are drying up and becoming further apart, some livestock-keepers (both settled and nomadic ones) have acquired their own deep wells which they fence so that only their own animals are watered there; this helps them maintain their animals in good condition and reportedly avoids conflicts with crop farmers.
- **Reserving pastures:** During their transhumance through crop-farming areas, the livestock-keepers have now started to sell some of their animals to be able to buy the rights for their herds to graze crop residues (e.g. sorghum) in irrigated farming areas. They also buy crop byproducts and hay, which they feed to their animals in periods of stress.
- **Destocking:** Some pastoralists have started to sell their most vulnerable animals when forage is scarce, and use the proceeds to buy food for the family and fodder for the remaining livestock, so as to maintain their herds.
- **Storing forage:** Crop residues and dry grass in the bush were reportedly not used before but are now collected and stored after harvest to serve as fodder in periods when grazing is in short supply (dry season and early wet season). Some farmers now also sell crop residues and hay to livestock-keepers, and have thus been able to diversify their sources of income.

#### **Box 3: Donkey as marriage gift**

The drying up of water sources and the lowering of the watertable has made it more difficult for women to fetch water. Women travel by donkey or on foot for several kilometres to fetch water for the household. Because of the work involved, young women had started to refuse to marry young men in villages that frequently experience water shortages. Older women in one such village therefore

introduced an innovation into the marriage arrangements. They started to buy donkeys to give a marriage gifts to their daughters. Donkeys ease the work of drawing water from the wells and carrying the water to the family home. In some cases, the husband uses the wife's donkey for transporting merchandise to the markets. The donkey thus plays a social role in securing water availability and consolidating marriage ties within the rural communities.

It was also observed that contracts were made between pastoralists and crop farmers to corral their cattle overnight on farmers' fields to deposit manure and urine as fertilizer, but it is not clear how new this is and whether it is in response to climate change. It is a practice that has been common throughout West Africa for decades, before anyone thought in terms of climate change. Many of the changes that farmers and pastoralists in Niger are experiencing and trying to respond to are not primarily due to climate change but rather to other political, economic and demographic changes that are limiting the possibilities for local people to adapt. Climate change is exacerbating these problems, but is not the most immediate cause of them. Identifying and doing something about the most immediate causes could help the local people more than just focusing on helping them adapt to climate change.

#### 4. Discussion

It was striking – and may be due to the fact that most of the researchers involved in the fieldwork were men – that few cases of innovation by women were recorded. This does not mean that women do not innovate. For example, in pastoral areas in Ethiopia, the PARIMA (Pastoral Risk Management) project recorded inspiring examples of how women pastoralists, when faced with climate change and other pressures that threaten their families' lives, took the initiative to form mutual-help groups and to diversify into petty trading, small-ruminant marketing and other forms of income generation (Coppock *et al* 2009). There is obviously a need for deeper-going investigation with a gender lens in order to recognise the role of women in local adaptation and innovation.

In addition, it is not always evident that these practices are innovations or adaptations that come about as a direct response to locally perceived climate change. Some of them may be a response to climate variability rather than to long-term change.

During the process of trying to recognise and understand local innovation in CCA, the following insights were gained:

- **Vulnerability to climate change is determined by multiple factors.** Vulnerability is complex, being determined by a combination of different factors (demographic changes, macro policies, market changes etc). Consequences of climate change cannot be clearly separated from those of other pressures on the livelihoods of rural people. For example, in the case of pastoralists, the root causes of their vulnerability to climate change lie in their marginalisation in national or regional decision-making about resource use and, in many areas, the unfavourable government policies towards these groups. When trying to address CCA, primary attention should be given to these root causes of vulnerability. Focusing only on technical adaptation to climate change would be blind to the still greater and more immediate challenges to the livelihoods of communities and could exacerbate the vicious cycle of impoverishment, completing undermining their capacity to survive, let alone adapt.
- **“Traditional” practices emerge from dynamic innovation.** Smallholder farmers and pastoralists have generations of collective knowledge and experience in adapting to ecological and socio-economic changes and have developed a wealth of indigenous knowledge and practices to deal with them. Their indigenous knowledge system is dynamic. It is characterised by flexibility and adaptability and is strongly integrated into their sociocultural system. It is not easy to distinguish these traditional practices from more recent processes of local innovation, which is equally a reflection of flexibility and adaptability. Moreover, outsiders may have difficulties recognising local innovations that consist of small incremental changes in what appear to be still “traditional” practices. It is not important to differentiate between local

innovations *per se* and the application of traditional practices. One advantage of the “climate-change alarm” is that external actors (scientists, extension workers, academics etc) are now starting to recognise and accord more value to some long-standing local practices that are, under uncertain climatic conditions, more suitable than many introduced technologies.

- ***Adaptation to climate change is a continuous process.*** Adaptation is a process that needs to deal with both current and future vulnerability. Some forms of adaptation may be appropriate at the current time but not necessarily for the future. This implies that adaptation mechanisms need to be regularly assessed for their current and future relevance. To reduce vulnerability and strengthen resilience, it is not important to try to perpetuate any specific form of adaptation (innovation) to climate change (or other pressures) that has been developed at a given point in time. Rather, in order to reduce vulnerability and increase resilience, it is important to strengthen the capacity of the local resource users to continue to adapt to changing conditions – of whatever kind – in good collaboration with other relevant stakeholders.
- ***Not all local innovations have positive impacts.*** It does not help the local people to romanticise all the results of their innovativeness. In some cases, the people may not recognise the longer-term repercussions on the environment, or the innovations may be practised by more powerful people who are disadvantaging other resource users in the area. For example, the building of private and communal waterpoints in pastoral areas of Ethiopia has encouraged some pastoralists to settle at least part of their family – often the women and children – close to the water sources. Over time, this innovation could easily lead to problems with water pollution and degradation of land around the waterpoints. Similarly, the innovation by crop farmers who cut and sell hay from communal areas may mean that resources that herders formerly used freely for grazing their animals are now collected by the farmers and used for their own animals or are sold, and the herders become worse off than before. Innovation in the direction of privatisation of common property resources could have serious socioeconomic repercussions. The impact on poorer people – often women – who depend highly on these resources needs to be considered by the communities involved.
- ***Climate-change adaptation requires more than only local innovation.*** Even if local people accustomed to coming to terms with variable nature have an intrinsic capacity to innovate, there are other factors that affect their vulnerability – and attention needs to be paid to these factors which may, at first glance, not seem to be directly linked with climate-change issues. Moreover, as mentioned above, local knowledge and innovative capacities have their limitations. Contributions from external bodies of knowledge and agencies can help to stimulate local creativity. Other actors, working together with local people, have an important role to play in recognising local capacities and resilience, and helping local people to enhance their knowledge and creativity and to engage in joint innovation processes. This has been the principle behind PROLINNOVA from the outset – one that also fits into initiatives to support CCA.

## 5. Conclusions and the way forward

Local innovation in CCA needs to be assessed together with other environmental, socio-economic and policy changes. This helps avoid the trap of romanticising locally developed practices as if they were evidence of deliberate adaptation to climate change. Nevertheless, it is important to give attention to local innovations, because they are sources of valuable new knowledge based on deep-rooted experience of the local people. Farmers and pastoralists living in marginalised and risk-prone areas have survived for generations through informal experimentation, flexibility and adaptation. Their traditional practices and more recent innovations can bring insights into hitherto unexpected possibilities to adapt to climate change.

There is a clear need to continue investigating how such farmers and pastoralists respond to challenges related to climate change, in order to inform policymakers and other stakeholders of the potential role that local people’s capacities can play in local adaptation, and to trigger a process of recognition and reflection. The focus should be not so much on specific innovations, but rather on documenting local innovation as a process. To be sure, at the local level, farmers and pastoralists may be able to benefit from knowing what others in similar conditions are doing to cope, and then

adapting the innovations and practices to their own conditions. Disseminating information about local innovation could stimulate appropriate adaptation by resource-poor communities, as it would help increase their self-confidence and motivation to adapt. Although documentation of innovations is not an end in itself, it remains important as a symbol of the local capacity to react creatively to local problems.

Seeking to understand current efforts of local communities to cope with and adapt to climate change or climatic variability reveals local innovativeness. This provides an entry point for a bottom-up approach to supporting CCA, starting with and building on local capacities and ideas. Rapid adaptation to climate change demands such a multi-stakeholder approach, building on the strengths of each stakeholder group. Recognition of local innovation could lead to more equal partnership in formal research and development activities. Moreover, the results of such joint innovation processes would have a higher likelihood of sustainability than would external interventions foreign to the local people. The very process of multi-stakeholder interaction in research and development, starting with recognition of local innovation and involving also policymakers at various levels, promises to strengthen local capacities to adapt and therefore to cope better with climate change.

This would avoid the risk of dealing with CCA much like agricultural research and development has been dealt with in the past: in a top-down way. An approach of farmer-led joint innovation to adapt to climate change, using local creativity as a starting point, would be complementary to macro-level policies, and will be key to increasing local resilience.

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## Acronyms

CCA	climate-change adaptation
CIA	Central Intelligence Agency
CRESA	<i>Centre Régional d'Enseignement Spécialisé en Agriculture</i> – Regional Centre for Agricultural Education, Faculty of Agronomy of the University of Niamey
INRAN	<i>Institut National de la Recherche Agronomique du Niger</i> – National Agricultural Research Institute
NGO	non-governmental organisation
NRM	natural resource management
PFE	Pastoralist Forum Ethiopia
PID	Participatory Innovation Development
PROLINNOVA	Promoting Local Innovation in ecologically oriented agriculture and NRM