Case Study – Piloting innovative approaches to tackle climate change in drought-prone East Africa

Christian Aid's Climate Change Innovation Fund was established to both raise awareness of climate change and support innovative adaptation approaches in Africa to increase community-level resilience. Now in it's second phase, it has funded 24 projects across the continent on issues as diverse as mobilising civil society in Nigeria to develop a National Plan of Adaptation, raising awareness of climate change through schools and local leaders in Rwanda, developing community-based adaptation plans in Burkina Faso and working on water, sanitation and climate change in poor urban areas in Kenya.

Particularly prone to drought are the semi-arid areas of East Africa, extending along the "drought corridor" from central Tanzania through eastern parts of Kenya and into southern Ethiopia and Somalia. Small-scale crop production and livestock herding are the main livelihoods in these areas, both characterised by their vulnerability to climate change. Drought is the most critical climatic constraint to development in semi-arid Tanzania, its impact aggravated by low soil moisture retention capacity, highly variable rainfall and low adaptive capacity of farmers. Christian Aid partner INADES has been implementing an adaptation initiative in Manyoni and Chamwino Districts, central Tanzania, to increase the resilience of vulnerable communities to cope with and adapt to climate change and variability by using reliable information on climate forecast and prediction.

This work involves linking up with meteorology stations to collect, analyse and assess meteorological information, data and trends on climate forecast relevant to the project target villages. This is then combined with community perceptions of changes in weather patterns over time (past and future) and the impact of this on livelihoods. A key step is to process climate science information to make it accessible to community members in an easily understood format and language suited to their needs. Given the uncertainty involved in estimating future local climate change, farmers are also trained at this stage in the interpretation of probabilistic forecasts.

Inventory and participatory assessment of local knowledge in climate and weather forecasting is achieved by involving community representatives in activities such as collection of local indicators of weather patterns, building timelines of past climate events to determine emerging trends and participatory climate information ranking to establish what type of climate information is most important for the farmers. This then informs the climate risk assessment with communities of the likely impacts of climate change – a process that aims to identify both the vulnerabilities to the climate forecast and the capacities of the community to respond. Key outputs include climate risk maps, ensuring that particularly vulnerable groups are included in the exercise and understanding the institutional framework in which adaptation occurs.

Both the community assessment of climate change and the risk assessment process feed into the key focus of planning and implementing viable community-based adaptation strategies. This involves identifying improved adaptation options, assessing these options based on their constraints and opportunities and validating and prioritising the most suitable into an adaptation options menu. Finally, these plans are used as the basis for interaction with relevant district authorities in order to influence policy and mainstream adaptation plans into district development plans.

The project has used a strongly participatory approach to these activities – action research to assess the potential role of seasonal forecasts, PRA to assess climate risk – together with the sustainable livelihoods framework to explore the links between climate and livelihoods. This has brought together a range of stakeholders including agricultural extensionists, the Tanzania Meteorological Agency, the Hombolo Research Institute in Dodoma and District authorities. Although the work is ongoing, preliminary findings have confirmed the influence of climate change on wind, rainfall and temperature. Wind, particularly increased wind strength, is the most frequently mentioned change. Communities felt that generally temperatures were getting warmer, but two villages suggested the cold period in June-July was getting colder.

Later onset of rains, earlier ending of rains, less predictable rainfall and rainfall amount reduced were the most commonly cited changes to precipitation. Seasonal rainfall data from 2000 showed that community understanding correlated closely with statistical data showing levels of 300 – 665 mm per annum. Based on this assessment, communities predicted a shift from a historical pattern of one bad year in four and one serious drought per decade to three bad years in five. Due to the inaccessibility of meteorological data at community level, emphasis was placed on the use of local forecasting methods using tree, insect and bird behaviour.

Communities stressed their resilience in the face of these changes including their energy, endurance and agricultural skills, the diversity of crop varieties they have developed (including drought-resistant varieties) and the innovations they have develop (such as water-harvesting technology and food storage). However they also highlighted factors that undermined these characteristics, such as lack of access to credit and markets, insecure land rights, difficulties associated with women running businesses the need to use scarce financial resources for school fees rather than investing in their livelihoods. As well as providing the basis for the development of adaptation plans to be implemented through 2009, those involved felt that translating and communicating information on adaptation and facilitating interaction between communities and other actors to increase awareness, understanding and responsiveness were vital preconditions.

In drought-prone eastern Kenya, Christian Aid partner UCCS has been working with Ndaki Community-Based Organisation to address problems around water availability and agriculture. Farmers confirmed a number of aspects of climate change that have characterised the past 10 years, including reduced rainfall in both long (March – June) and short (Oct – Jan) rainy seasons; changing dates for both start and finish of both rainy seasons – the long rains tend to start properly in April rather than March and end in May rather than June; when it does come, rainfall tends to come in more intense episodes lasting for several days followed by extended spells of hotter dry weather - if a dry spell coincides with germination of the maize, this can have a severe effect on yields; increased temperature in the Jan – March dry season. With the exception of 1997/8, all seasons were characterised as food deficit with most households needing to purchase food.

In response to these changes, farmers have changed their cropping patterns although they have not as yet introduced any completely new crops. They used to divide cultivation into sorghum and millet during the short rains and maize, pigeon peas, pumpkin and cassava during the long rains, but now sorghum and millet have been reduced and maize is grown in both seasons. Cassava and pigeon peas are grown over 12 months (i.e. both rainy seasons) before harvesting but whereas they used to be planted before the onset of the long rains, this has now been shifted to the start of the short rains as these are viewed as less erratic.
Other adaptation strategies mentioned included zero-grazing of livestock, young men not marrying due to lack of resources and accessing family planning services to limit family size. A further response has been the development of a programme of sub-surface dams, constructed to improve water supplies in the area, seen as a key adaptation strategy if the situation gets worse. Currently 12 are planned, 3 of which have been constructed by the project. These are built into the beds of seasonal streams so that when rains arrive, water is diverted into the water table and provides more sustainable supplies for shallow wells sunk around the dam. The existing main source of drinking water is the River Thika 5 km away, which is polluted from passing through Thika Town and irrigated pineapple schemes. Each dam will provide for a catchment of about 630 people. Benefits include closer and more convenient sources of water for both domestic use and livestock, water collection times reduces from 3 to 1 hour and water supplies available to support tree nurseries and kitchen gardens.

The most common coping strategy when faced with short-term food shortages is charcoal burning. About 2/3 of the community confirmed they engage in this activity, despite knowing that trees are important to improving the local microclimate and deforestation has increased soil erosion and intensified the impact of climate change. One of the key priorities for the community when planning the network of sub-surface dams is the provision of water for tree nurseries that can promote reforestation of the area and reduce the pressure on existing forest resources from fuelwood collection and charcoal burning.

In terms of adapting to climate change, farmers also raised a number of challenges they faced apart from water availability. The most important of these was access to reliable weather and seasonal forecasts. Without a local climate station, farmers point out that their access to weather forecasts relevant for their location is minimal and they often receive the seasonal forecast in a format that is difficult to interpret and too late to act on when making decisions about which crops to plant and when. As in Tanzania, they have a wealth of local knowledge but also need technical advice on both climate and climate-resilient livelihood options that will enable them to adapt to the drought-prone future they face.