

Farmers' perceptions lead to experimen

“Learning centres” in seven African countries are identifying opportunities for adaptation, based on farmers’ perceptions of climatic changes. Together, researchers, farmers and extension agents are experimenting with crop varieties and soil fertility improvements. Results so far highlight that adapting to climate change is not just about technical options, but access to markets, credit or information is also necessary.

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For decades, small-scale farmers across Africa have struggled to maintain food security for their families. With few alternatives available for sustaining their livelihoods, it is questionable whether the coping mechanisms that have evolved have contributed to the resilience of the farming and livelihood systems. In the face of external pressures, it is apparent that the systems are virtually at rock bottom and farmers are entangled in intricate poverty traps. The emerging evidence of climate change, coupled with increased climate variability, points to a dire need to develop local communities’ capacities to cope with this extra pressure.

Under the Climate Change Adaptation in Africa programme, a study was initiated in 2007, to work with smallholder farmers on identifying and using improved farming technologies to adapt to climate change and variability. A parallel aim was to strengthen the capacity of individuals and institutions to conduct related research. The study is being undertaken in seven countries: Uganda and Tanzania in East Africa, Ghana and Mali in West Africa, and Mozambique, Zambia and Zimbabwe in Southern Africa. The sites represent Africa’s major climatic zones, with rainfall ranging from about 600 mm per year in the maize dominated crop-livestock systems of Zimbabwe, to 2200 mm per year in the banana-based systems of Tanzania. Land holdings range from less than 1 ha in Ghana to more than 10 ha in southern Mali.

Summary of farmers’ perceptions of the indicators and causes of climate change across different regions in Africa.

Indicators: Increased drought incidences • Unpredictable wind movements • Changes in seasonal temperatures (very hot summers and very cold winters) • Prolonged winter seasons • Marked delays in on-set of rainy seasons • Disappearance of wetlands and declining water reservoirs

Causes: Deforestation • Poor farming practices destroying soils and water resources • The rise of industries, towns and cities • Increasing incidences of wild fires • Lack of respect of traditional cultural values (e.g. cutting down of sacred trees) • Unexplained natural forces

We started by focusing on farmers’ perceptions of climate change and asking who is vulnerable and how. The next phase was participatory experimentation. This aims at promoting interactive learning among different partners, and testing alternative farming practices that farmers could use to adapt to climate change and variability. This was done mainly through establishing “learning centres” in each country.

Farmers’ current understanding of the “threat”

There are diverse and mixed views about the causes and indicators of climate change across and within communities in Africa, despite the evidence of a general awareness (see Box). At a local level, a wide range of indicators for predicting wet and drought seasons were identified. For example, farmers believed that cold winters indicate a drought, while hot summers signify good rains. In addition, farmers identified specific environmental changes that they had observed. In Wenchi, Ghana, farmers listed the following observed changes:

- reduction in soil fertility levels
- reduction in yields of major staples such as yam and maize
- disappearance of cocoa as a major cash crop
- disappearance of the forest and wildlife
- changes in rainfall pattern
- proliferation of disease and insect pests
- proliferation of obnoxious weeds, e.g. spear grass

Farmers’ own responses to these changes included planting different (early maturing) crops, planting earlier and using more agro-chemicals.

Learning with farmers to identify opportunities for change

Since 2007, an inter-disciplinary team of researchers, extension and agricultural input suppliers worked with farmers to identify interventions which could help them minimise vulnerability to climate change. Farmer discussion groups were formed, facilitated by local leaders and extension personnel. Local leaders and farmer representatives had participated in earlier climate change awareness workshops with district policy makers: what they had heard and learnt there helped to invigorate the community-level discussion workshops. Farmers and stakeholders discussed topical issues and challenges that emerged, which then formed the basis for further interventions and participatory action research.

Across all study sites, the major challenge shared by communities was poor and declining soil fertility. Although this may sound counter-intuitive when addressing issues of climate change and variability, it has long been recognised that poor soil fertility is the overriding constraint to the efficient use of available water by crops. A common objective in all communities was to achieve high crop yields in favourable seasons, and to intensify productivity. Integrated Soil Fertility Management (ISFM) was therefore used as a key entry point. We defined this as: “A combination of a proven set of concepts, principles and practices on the efficient use of available organic and inorganic resources... in maintaining or improving soil fertility leading to sustainable crop production for household food and income security, and enhanced livelihoods.”

As part of the project activities, “learning centres” have been established in each of the participating communities. Participatory trials are being carried out there in collaboration with the farmers. These “learning centres” will contribute to creating a more effective context for discussing issues related to climate change, thereby building the adaptive capabilities of these farmers. The “learning centres” integrate local, conventional and emerging knowledge, in testing different ISFM technologies, such as effects of planting dates, or alternative crop types and varieties as prioritised by communities. Strategically located fields were used to test the technologies best suited to the circumstances of specific farmer groups (e.g. by gender, available resources or social clubs). Agricultural input companies are also involved in the “learning centres”, responding to farmers’

tation and learning

demands for alternatives and working with researchers to develop new options for fertilizer management. Farmers are interested in using the available organic nutrient resources (including nitrogen-fixing legumes) in combination with the small amounts of mineral fertilizers they can afford.

Emerging opportunities for communities to adapt

Results from the participatory experiments are beginning to appear. One evident change is that farmers are interested in different crop types and varieties. Some are now demanding new crops and varieties, while others are seeking to revert back to traditional crops (or cultivars they used long ago). Lack of seed within communities is still a major challenge. Similarly, suitable crop types and varieties are difficult to find on local markets as agricultural input suppliers have tended to lag behind. Farmers are slowly moving away from some of the traditional cropping practices. Women farmers in southern Africa are proving to be the custodians of legume seeds and cereal cultivars that had previously been discontinued by dominant seed companies.

Farmers are aware of the increasing variability in climate, but it was apparent that they are not yet able to respond to it adequately. For example, extreme events of floods and droughts within the same season give small-scale farmers little opportunity to recover or respond. There is apparently little emphasis on building medium- to long-term adaptive measures because of limited information and knowledge about the implications of the observed trends. Current strategies to adapt have tended to intensify land degradation. Examples include the encroachment of cropping and livestock grazing into fragile environments such as highly erodible soils and aquatic environments.

Learning experiences from the different countries suggests that the impacts of climate variability among African communities are highly differentiated according to land tenure, traditional beliefs, resource availability and gender. However, this provides opportunities for developing adaptation mechanisms directed at specific vulnerable groups:

- In Wenchi district, Ghana, farming is dominated by immigrants who use their agricultural produce as payment for land leased from the landlords, who expect annual payment regardless of whether it has been a good growing season. Short-term climate variations then pose a major threat to the security of tenure for the immigrant farmers.
- In parts of central Mozambique, tradition does not allow for farmers to grow pearl millet (due to bird problems), despite its apparent superiority over maize in terms of drought tolerance. Selection and testing of drought-tolerant maize varieties was one of the key priorities to emerge, together with education of farmers and local leaders on the need for alternative crop types such as sorghum and millets.
- In Zimbabwe, farmers in previously maize-dominated high rainfall zones have begun experimenting with sorghum, millet and drought-tolerant maize. Early planting was identified as a major adaptive strategy, but some farmers, notably women-headed households, cannot meet this challenge due to other demands on their labour.
- Increasing frequency of seasonal floods has led participating farmers in Tanzania to demand technical and institutional support so that they can begin producing rice. In dry years, a major source of vulnerability is the increase in transmission of cattle diseases due to the congregation of large numbers of cattle at water holes.



Photo: Paul Mapfumo

With increasing awareness of changing climatic conditions, farmers are keen to look for ways to adapt their systems to cope with this extra burden. “Learning centres” provide a good opportunity for all parties to meet and discuss.

These adaptation strategies must not be used in isolation. For instance, the use of early maturing crop varieties must be accompanied by other crop management practices such as crop rotations or the use of cover crops. This, however, requires additional institutional support, such as credit, access to both input and output markets and information. This will enable farmers to increase and sustain their productivity and production in the wake of changing climatic conditions. Migrant farmers are more vulnerable to the adverse effects of climate change than native farmers, because the majority of them do not have secure access to land. Their adaptive capacity is also low, due to low levels of human, financial, institutional and technical capabilities as well as limited access to markets.

“Learning centres” are currently at different stages of implementation, and experimentation is continuing. By involving a variety of partners in the learning, testing and adapting processes, relationships improve and farmers are exposed to new opportunities. However, the increasing costs of household fuels and agricultural inputs, coupled with low prices of agricultural produce, and limited off-farm livelihood opportunities, continues to pose major threats in building the capacity of farming communities to adapt to climate change and variability.

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