

# Smallholders adapt to climate change

Smallholder coffee and tea growers in Latin America and East Africa are suffering from changing climate conditions. Kathleen Schepp reports on initiatives to help farmers adapt to the new conditions.

Smallholder growers in developing countries are especially affected by changing climate conditions, like unpredictable rainfalls, delayed growing seasons or prolonged drought periods. Due to their high vulnerability to environmental and climate risks they are already suffering from increasing pests and diseases, unpredictable water availability, landslides and the loss of product quality and yield.

This is the case, for example, for Cafédirect's smallholder coffee partners in Nicaragua, where members of CECOCAFEN lost half their beans and 30 per cent of their maize harvest in 2009 due to increasing temperatures and extreme weather events like hurricanes.

Similarly, Willington Wamayeye, general manager of the Gumutindo

coffee cooperative in Uganda, reports that up to 40 per cent of the coffee harvest from his cooperative was lost in 2007 due to changing rainfall patterns. In addition, Cafédirect's tea partners in East Africa are suffering from changing climate conditions.

## The AdapCC initiative

To help smallholder growers to strengthen their ability to cope with climate change, the leading British Fairtrade company Cafédirect and the German Technical Cooperation (GTZ) are implementing a three year public-private partnership (PPP) between April 2007 and March 2010. The main objective of the joint initiative, called "Adaptation for Smallholders to Climate Change" (AdapCC), is developing and implementing climate

change adaptation strategies with pilot coffee and tea organisations in four countries in Latin America and East Africa.

## The Risk and Opportunity Analysis (ROA)

To develop adequate adaptation strategies at the co-operative level, AdapCC enhanced and applied a process called "Risk and Opportunity Analysis" (ROA). ROA consists of a toolkit to define site-specific adaptation strategies through a participatory process. The analysis identifies physical and social vulnerabilities that can turn into disasters for smallholder growers when an extreme weather event occurs or the regional climate changes. The methodology evaluates possible damage and loss for vulnerable



Mud slides like this one at Montero in Mexico are becoming more frequent.

Credit GTZ





Smallholder coffee farmers in Mexico are being encouraged to use natural 'pesticides' like the fungus "*beauveria bassiana*" to control pests like the coffee borer.

Credit GTZ

smallholder production systems as a consequence of these catastrophes, as well as analysing the possible benefits and disadvantages of the identified adaptation measures. Moreover, the ROA process aims to discover the factors that lead to increasing risks for the pilot groups and their communities.

Based on this information, one can develop concrete measures to reduce existing vulnerabilities and negative

effects. The process not only identifies existing threats and risks, but also forecasts climate scenarios on future agricultural production. In cooperation with the International Centre for Tropical Agriculture (CIAT), maps were elaborated that show the future suitability of current coffee production areas in Latin America and also identify new production areas that will become suitable under future climate scenarios.

Combining participatory data and scientific results enables the design of long-term adaptation strategies that also include options for diversification or new cultivation opportunities, as well as no-regret measures to reduce vulnerabilities.

AdapCC applied the ROA toolkit with three coffee organisations in Peru, Nicaragua and Mexico as well as with one tea growers organisation in Kenya.



The implementation of the identified adaptation measures is already showing its first positive results.

### Más Café in Mexico

In Chiapas, the most important coffee growing region in Mexico, the AdapCC initiative is supporting the smallholder coffee-trading organisation Más Café.

One of the biggest problems identified together with two Mas Café member cooperatives during the ROA process is the high rate of deforestation. This represents a major risk not only to the local environment, but also to the sustainability of future coffee production in the area, as shade trees ensure the production of high quality coffee in the area. Furthermore, shade trees enhance the resilience of the coffee ecosystem against climate and environmental impacts.

Having identified the risk, the local producers have successfully set up and signed two agreements to ban the practice of burning in their area. In

addition, the existing Más Café tree nursery has been expanded to provide various communities with different types of native seedlings, enabling them to maintain and extend the surrounding forests.

Another measure to reduce deforestation is a project which has been set up between the Mexican Environmental and Natural Resource Secretariat (SEMARNAT), Más Café and the cooperatives. The project aims to minimise wood consumption for construction. Aimed at achieving sustainable forest management, two capacity-building sessions have been held and an additional reforestation project has been designed.

As always, training and instruction of the cooperatives' members is a key aspect of a successful strategy, and it is for this reason that a training module on environmental awareness has been developed and will be implemented in the second half of the year. This module will educate cooperatives and their

communities on environmental issues, at the same time making them aware of the increasing risks of climate change. Beyond cooperative members, it is also vital to train the local people who ultimately depend on the production of coffee. As a result, 40 women have been trained and instructed on how to use energy-saving stoves, 300 of which have been made available to the communities.

Another concern for smallholder coffee producers is the increasing pest problem triggered by the changes in temperature and rainfall. These changes jeopardise quality and quantity of the coffee harvest each year. The increasing use of toxic agrochemicals to try to cope with the problem only creates more PROBLEMS, such as the contamination of the local environment and the risk it represents to the health of those living in the area.

Consequently, an alternative solution had to be devised and implemented. First of all, a common



A smallholder coffee farmer in Chiapas, Mexico, attends an AdapCC workshop.

Credit GTZ





Smallholder tea farmers in Michimikuru, Kenya, are now vulnerable to climate change.

Credit GTZ

agreement regulating the use of toxic pesticides and replacing them with biological ones has been put in place in two cooperatives. These cooperatives now work with "*beauveria bassiana*", a fungus that grows naturally in soils and feeds off insects such as the coffee berry borer, so acting as an effective, natural pesticide.

Additionally, two collective vermicomposting units have been installed for use by the entire community, producing around 200 tonnes of compost annually. Over 800 composting units have also been installed on the single family level. These create an essential source of organic fertiliser that is important to prevent the erosion of soils. Further measures taken for efficient pest management are the renovation of the coffee plants and plots, of which over 1000 hectares have already been renewed - one hectare per producer in four different cooperatives. The planned training module on environmental awareness for the communities will reinforce also this renovation component of Más Caf  s adaptation strategy.

The use of renewable energy in Más Caf  s dry mill is also being evaluated and a study on suitable sources of alternative energy has already been developed. Following the identification of potential energy sources, a cost-benefit analysis for the implementation of alternative energy will be completed.

The process of coffee drying has also been profoundly affected by the changing climate. Changing rainfall

patterns no longer allow producers to sun-dry their coffee after harvesting in January and February. New techniques had to be developed to make the process independent of weather conditions. This was achieved through various national and international exchange visits, which enabled the producers to share ideas with each other and find alternative methods for the drying process. Following these visits, 20 solar driers were installed at two cooperatives and a training module was put in place for improved wet processing at family level.

### Tea at Michimikuru in Kenya

The diversification of food and income is an important aspect of the adaptation strategy planned for the pilot region in Kenya. A dense tea monoculture, combined with degraded lands and unsustainable agricultural practices has meant smallholders are now vulnerable to climate change in the Michimikuru area. These factors are compounded by the local population's very high dependency on tea production as the main source of income.

In cooperation with the Kenyan Ministry of Agriculture, alternative crops have been identified for the region, such as spinach and kale for subsistence and passion fruit for trade. Various workshops have been organised to encourage the adoption of these supplementary crops. To reinforce the workshops, 15 demonstration units have been set up, displaying the various crops that could be produced for subsistence in the area. These units are, at the same time, being used to instruct farmers on good agricultural practices like double digging, mulching and the use of compost.

Motivating farmers to change their agricultural practices and grow alternative crops is a key step towards achieving a more sustainable agricultural production system, diversifying food and income sources as well as securing food availability and reducing malnutrition in the region.

The high rate of deforestation in the pilot region is a major threat to local biodiversity as well as the production of tea. Firewood is a vital source of energy

both for local households and for processing tea in the factories. The consumption of large quantities of firewood represents a significant risk to the local forests, which are being destroyed at an alarmingly high rate. To improve the conservation of biodiversity in the area, different seed types of the local flora have been collected and an existing local nursery is being expanded. A number of tree planting activities, along with workshops for biodiversity conservation, have been organised and scouts put in place for every river, coordinating tree planting and pointing out malpractices. Local schools have also been involved, and each school is now setting up its own "Forest Corner" to teach students the value of the trees on its grounds.

Better soil management techniques are also being implemented in the pilot region. These range from the construction of terraces and embankments, to the application of manure and fertiliser and the reforestation of river banks. These measures are helping to reduce the risk of landslides and improve the availability of water.

An additional aspect of the adaptation strategy is the development of energy saving techniques for the local population, informing them through meetings, training modules and demo units. Locals are being encouraged to adopt new and more energy efficient jikos (cooking stoves), over 100 of which have already been made at the family level.

In cooperation with the Department of Social Services and Maendeleo Ya Wanawake (an umbrella organisation of women's groups), further meetings for women are presently being planned and implemented. Furthermore, training courses for making and selling these jikos are being provided, and the Michimikuru tea factory is looking into the possibility of providing an advanced payment scheme to assist its members in purchasing the new jikos.

For more information contact Kathleen Schepp, AdapCC project coordinator, GTZ, P. O. Box 5180, 65726 Eschborn, Germany. Tel: +49 6196 792374; email: [kathleen.schepp@gtz.de](mailto:kathleen.schepp@gtz.de)