

Climate-smart villages

Practical adaptation options to improve food security and resilience

Climate change hits smallholder farmers hard. More variable weather patterns cause crops to fail, undermining livelihoods and food security. At the same time, farming generates greenhouse gases (GHGs) that contribute to the problem. What practical steps can smallholder farmers take to adapt their agriculture to secure the food supply? And might those mitigate emissions? In a search for answers the CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS) is working with a vast range of partners to test an assortment of interventions in ‘climate-smart villages’.

The project launched in 2011 with 15 climate-smart villages in West Africa, East Africa and South Asia. By 2013, 22 villages were taking part, with more slated for Latin America, Central America and South-east Asia. All the villages are in high-risk areas, which will likely suffer most from a changing climate, and are places where partners have already established vital links with local communities. After a potential site is selected, a steering group of community representatives and researchers together identify appropriate climate-smart options for that village. These might include climate-smart technologies, climate information services, local development and adaptation plans and supportive institutions and policies, all tailored to that community's needs. The community chooses its preferred options in a process that aims to be as participatory and inclusive as possible, encouraging women and more vulnerable groups to participate. In Kenya, for example, more than 1100 households in the climate-smart villages joined self-help groups established by the project to support the communities, and 70–85% of the active members of the groups are women.

Interventions that deliver

In Kenya's Lower Nyando valley, farmers are discovering the value of agroforestry, with alleys of maize, sorghum and other crops sandwiched between rows of multi-purpose trees that stabilize and enrich the soil. What's more, demand for trees has led to nurseries springing up to supply tree seedlings. These nurseries in turn are becoming an important source

of income, particularly for women, who own more than half of the 22 nurseries now thriving in Lower Nyando. Working with farmers to incorporate small livestock, such as poultry, sheep and goats, into their farms brings additional resilience, income and food security.

Other activities focus on the management of natural resources. In Bihar, India, where soils are prone to water-logging, new drainage techniques can get rid of flood waters more rapidly at the same time as recharging aquifers; while in dryer villages in India and Kenya, rainwater harvesting is important. More effective management of soil carbon, precision application of fertilizers and energy-efficient machinery all play a part, depending on the specific needs of each climate-smart village. The primary goal of all the interventions is to help farmers to be more resilient and ensure food security. But there may well be secondary gains in mitigation, as many of the chosen technologies are expected to decrease GHG emissions.

In addition to farm practices, farmers in climate-smart villages are also testing climate-smart services, such as tailored weather forecasts to plan planting, harvesting and other activities on the farm (see Box). Advisories and weather forecasts are being delivered by mobile phones, and phones are also being used to enable farmers to buy index-based insurance that gives them a measure of protection in the event of extreme weather.

Spreading the word

The approach of climate-smart villages is bespoke, rather than one-size-fits-all, and there is enormous scope for learning what works in one site and adapting it for others, an approach the project calls “knowledge smart”. For example, farmers from

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Forecasts tailored for farmers

Farmers, especially in marginal areas, have always needed to predict the weather, and have many traditional means for doing so. However, the pace of climate change and greater variability challenge their ability to use traditional methods. CCAFS researchers have therefore been keen to act as a bridge between the information that farmers need and organizations that can supply that information and advice in ways the farmers can use. One of the many activities being tested in climate-smart villages is improved climate information services to enhance farmers' resilience. Armed with information such as the forecast onset of the rainy season, farmers can plan critical activities such as planting. CCAFS researchers are studying long-standing climate information initiatives in Mali and in India to understand what makes them successful and how such initiatives could be set up in other countries. The Mali program, established in 1982, was the first of its kind to give African smallholder farmers useful weather forecasts. From the start the project was a two-way street, with farmers telling scientists what they needed, and scientists training farmers to gather and share essential data, such as accurate rainfall statistics. CCAFS is adopting a similar approach in a pilot project in Senegal, with researchers working closely with the national meteorological agency and farmers to jointly develop forecasts, combining traditional and scientific knowledge. This participatory approach helps farmers understand and interpret forecasts more effectively, ensuring that they can act on the knowledge they receive through seasonal forecasts.

In the climate-smart villages, CCAFS researchers are observing how well farmers respond to seasonal forecasts delivered through various means including extension services, rural radio and mobile phones, including the different responses of men and women. Women, for example, tend to prefer face-to-face interactions for sharing information, as many of them do not have mobile phones, or cannot listen to the radio while out in the field where they spend long hours tending to crops. Early or late rains spell doom for unprepared farmers, so this information helps farmers cope with increasing variability.

Farmers and researchers in many similar projects have now discovered several ways in which to make sure climate information is not only useful but also reaches all who need it. To help countries learn from each other, CCAFS organized a meeting in Senegal in December 2012, together with the World Meteorological Association, the United States Agency for International Development and the Climate Services Partnership. The workshop brought more than 110 participants from 30 countries to learn from pilot projects and scale up. One of the goals of the Senegal meeting was to promote South-South cooperation between sub-Saharan Africa and South Asia to ensure that millions more farmers combine their traditional methods with modern advice to adapt to climate change.

Doggoh, a CCAFS climate-smart village in Ghana, visited Leo and Guiaro, two sites in Burkina Faso, because the CCAFS Climate Analogues tool indicated that farmers in these latter two sites were experiencing today conditions that the Ghanaian farmers could expect in the future. The Ghanaians were able to learn first-hand about the crops and techniques that their Burkinabe colleagues currently use.

Training-the-trainers is another essential element in farmer learning networks, and has proved its worth in Bihar. CCAFS partners Alternative Futures and Mahila Samakhyia, a national programme dedicated to empowering women, trained a core group of elected women who then took the message to more than 1500 additional women across the state. Crucially, many of the women trainers adapted the messages to be more appropriate to their local

culture, turning them into songs because that is how women convey, share and remember important information.

One of the great strengths of the climate-smart villages approach is its inclusiveness. Farmers from different communities, researchers from different disciplines, non-governmental organizations and other partners, all come together to test a range of options in an integrated fashion. Efforts to date show how food security and resilience can be improved in the face of climate change and at the same time suggest ways in which smallholders in all sorts of communities can adapt their agriculture.

To find out more, please visit <http://ccaafs.cgiar.org/climate-smart-villages>



Photo: K. Trautmann (CCAFS)

About CCAFS

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT). CCAFS brings together the world's best researchers in agricultural science, development research, climate science and earth system science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. www.ccaafs.cgiar.org

CCAFS is supported by CGIAR Fund Donors, Danish International Development Agency (DANIDA), Australian Government Overseas Aid Program (AusAid), Irish Aid, Environment Canada, Ministry of Foreign Affairs for the Netherlands, Swiss Agency for Development and Cooperation (SDC), Instituto de Investigação Científica Tropical (IICT), UK Aid, Government of Russia, The European Union, and with technical support from the International Fund for Agricultural Development (IFAD).