

The benefits of adopting already-available technologies could override the negative impacts of climate change



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Climate, agriculture and food security: A strategy for change

Climate change presents a very real threat to agriculture. For many millions of people in developing countries this translates into a direct threat to their livelihoods and food security. Yet we have at our disposal a wealth of knowledge that, if turned into action, would allow these same people to build resilient livelihoods and prosper in spite of variable and uncertain weather, both now and into the future.

Agriculture is also adding to the climate change problem. Current practices, including the conversion of forests and grasslands for crops and pasture, contribute some 31% of global greenhouse gas emissions. Again, we know how to change this.

The centres of the Consultative Group on International Agricultural Research (CGIAR) and their partners propose a strategy for change. Based on more than three decades of work dedicated to helping poor farming, fishing and forest communities achieve sustainable livelihoods, the strategy has two thrusts: intensify efforts to disseminate the fruits of this work, and at the same time steer research in new directions to stay ahead of climate change.

At least in the near years, the benefits of adopting already-available technologies will override the negative impacts of climate change. The immediate benefits, in terms of improved food security, livelihoods and environmental security, make this a 'no regrets' approach – these changes are worthwhile whatever happens to the climate. But the uncertainties that accompany climate change add a massive incentive to take this path, to build the resilience of farming and food systems today and into the future.

Many of these same technologies also offer mitigation benefits. Soils and trees, as well as other vegetation, are carbon sinks and managing them sustainably almost always enhances their carbon storage. There is no doubt about the need to reduce greenhouse

Climate change and agriculture: What we can do right now

- ▶ **Climate risk management:** Mainstream the systematic use of climate information into agricultural systems.
- ▶ **Water:** Produce more food with less water. Water harvesting, precision irrigation, flexible water storage and using wastewater are some of the relatively simple technologies that can help do this.
- ▶ **Crops:** Deploy existing stress-tolerant varieties, and continue developing new ones. Make best use of agrobiodiversity in gene banks and farmers' fields to increase resilience of systems. Stay ahead of pests and diseases with modelling and monitoring programmes.
- ▶ **Soils:** Promote widespread uptake of sustainable soil management practices, such as conservation agriculture, measured fertilizer use and agroforestry. Provide incentives to capitalize on the carbon storage potential of healthy soils.
- ▶ **Livestock:** Incentivize the many sustainable options for livestock systems, including payments for environmental services such as rangeland rehabilitation.
- ▶ **Fisheries:** Promote sustainable aquaculture as an adaptation strategy; and sustainable management of capture fisheries, and of the seas and rivers on which they depend.
- ▶ **Forests:** Stop deforestation, initiate reforestation, and manage forests sustainably with strategies that place value on forest resources, including biodiversity, and ecosystem services.
- ▶ **People and livelihoods:** Build adaptive capacity so that people and communities know the options that are available and can make the best decisions in adapting their livelihood systems.

gas emissions from agriculture and land use change, but the great potential of different agriculture and resource management practices for mitigation objectives is often overlooked. Now this needs to be embraced.

Climate change brings an opportunity to turn around agriculture in developing countries, making it more sustainable, reducing its negative impacts on the global environment, and at the same time enhancing the food security and livelihoods of many millions of people. But bringing the products of more than three decades of research into use, and quickly, will be a tremendous challenge. Success will depend on the commitment of enlightened policy makers, exceptional communications efforts, effective targeting and significant investment.

As dangerous climate change threatens, more will be needed. We will need to take rapid strides forward in understanding what is going to happen to our farming, fishery and forest systems as the climate changes; the interactions that will occur with other global changes that are also under way; and within this complex and dynamic situation, the trade-offs we may face between food security, livelihoods and environmental security. We will need to develop new and inventive responses to what is likely to be the most complex challenge that the world's food production systems have ever faced. To do this, we will need new ways of working, new non-traditional partnerships and truly integrated approaches.

The Challenge Program on Climate Change, Agriculture and Food Security (CCAFS) is set to address these needs. Due to launch in early 2010, CCAFS unites the world's best researchers in agricultural science, climate science and earth system science, to open up new and unique possibilities in the search for solutions. The

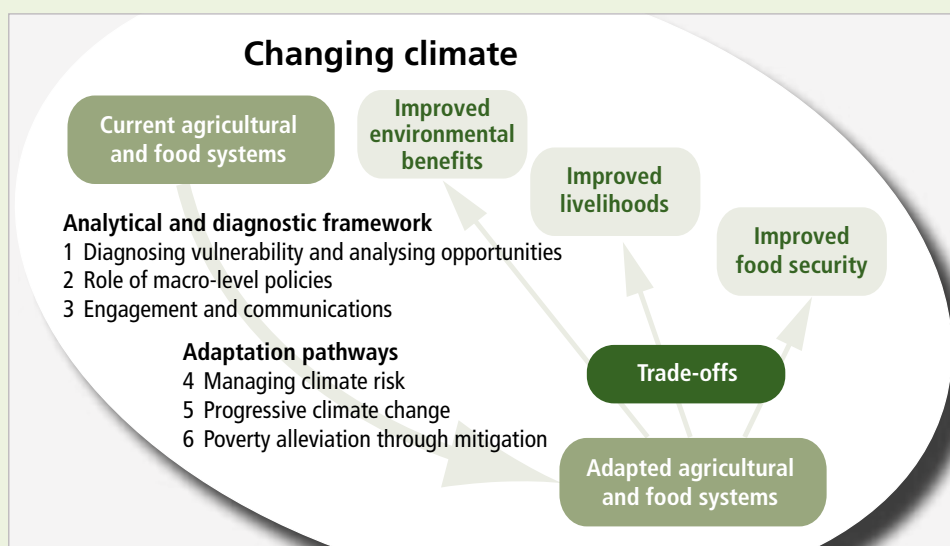
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Challenge Program will also provide an overarching programme to support the CGIAR centres in their climate change-related endeavours, and help consolidate their efforts. Over the next 10 years, the Challenge Program aims to build the foundations for responsive, adaptive agricultural systems that reduce vulnerability to current variability and uncertainty, and pave the way for successful management of long-term changes.

We are at a crossroads in the development of our planet. The decisions we make now, for agriculture and natural resources as well as other sectors, may prove to be the most important decisions humankind ever collectively makes. Food security is one of the basic human rights, yet an estimated one billion people – more than one person in six – do not enjoy that right. Without significant changes to agricultural and other natural resource-based systems, hunger and poverty will be perpetuated into the future, and affect many more.

As the future climate unfolds, agriculture – and agricultural research – face a race against time. The CCAFS Challenge Program and the CGIAR centres are committed to pushing the boundaries of science in the search for ways to stay ahead of climate change. The future of agriculture may depend on these efforts.

Next steps: The Challenge Program on Climate Change, Agriculture and Food Security



CCAFS is a new 10-year research initiative launched by the CGIAR and the Earth System Science Partnership (ESSP). CCAFS seeks to overcome the threats to agriculture and food security in a changing climate, exploring new ways of helping vulnerable rural communities adjust to global changes in climate. Research under the six themes will help current agricultural and food systems adapt to a changing climate, while managing trade-offs between food security, livelihood and environmental goals.

This brief summarizes a report of the same title that was commissioned by the Alliance of the CGIAR Centers, developed by the Alliance and CCAFS, and funded by Danida.

The full report can be downloaded at www.ccafs.cgiar.org

