

# Scientists reveal where growing conditions today mirror future climates

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With climate change posing a threat to food production around the world, scientists are developing a form of virtual time travel that can offer farmers in many countries a glimpse of their future by identifying regions where growing conditions today match those that will exist 20 years from now, according to a new report from the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

"Climate Analogues: Finding Tomorrow's Agriculture Today" is an effort by CCAFS to make climate change adaptation a more tangible endeavor by encouraging the exchange of knowledge between communities around the world regarding current agriculture practices that can help farmers maintain productivity in the future, despite potentially dramatic shifts in growing conditions.

"Climate change will significantly alter growing conditions, but in most places the new farming environment will not be novel in the global context," said Julian Ramirez, a scientist based at the International Center for [Tropical Agriculture](#) (CIAT) in Colombia and a lead author of the study. "Rather, the situation in the future will closely resemble conditions that already exist in other parts of the world. Making these links might offer clues about practical, proven approaches that could enable poor people dependent on agriculture to adapt their farming to changes in temperature and [precipitation](#)."

For example, according to CCAFS analysis, by 2030, maize producers around Durban, South Africa—which is hosting the current round of

international climate change negotiations—could face a one degree increase in temperature during the maize growing season. Studies by Stanford University and others indicate that such an increase would reduce yields by about 20% in the absence of adaptive measures. But maize farmers in Argentina and Uruguay are growing maize successfully today under average temperatures that are three degrees higher.

Similarly, soybean farmers in Argentina as well as in the central and southern United States are already managing conditions similar to the ones that soybean growers around Shanghai, China, will experience within about 20 years.

"If Chinese farmers want to continue growing soybean, they need to look at the kinds of farming practices and crop varieties that farmers in northern Argentina and other analogue regions are growing," said Andy Jarvis, who is leading the project at CIAT and is also a research theme leader for the CCAFS.

CCAFS researchers note that the climate analogues tool currently compares locations based on similarities in precipitation and temperature. It is also designed to identify analogues based on other features—data on soil type and even social and economic conditions are incorporated into the tool.

The tool can also be used in the reverse—looking at one particular location to identify where similar climates might be in 2030. To illustrate the concept, an analogue of present-day Los Angeles, California shows that the southern parts of United States' eastern seaboard and France, northern Germany, and the Netherlands might experience Hollywood's traditionally mild winter months (December to February) by 2030.

In 2012, the research team will pilot a series of farmer exchanges

between sites in East and West Africa and South Asia to help farmers see for themselves the changes in store and learn about adaptation strategies that could be applied back home. The farmer-to-farmer exchanges will also help researchers understand whether successful adaptation options in one place are indeed transferable to another.

"The analogues tool is rooted in the basic notion that for centuries farmers have been innovating and adapting in response to shifting conditions, providing a rich source of information on how agricultural systems can adapt to climate change," said Jarvis. "Our goal is to develop an inventory of local knowledge from around the world while linking regions that face similar challenges. We are in many ways turning the world into a laboratory for climate change adaptation."

"The climate analogues approach to adaption reinforces the broader message that maintaining [food security](#) in a world of dramatic and accelerated climate shifts will require new commitment to global cooperation," said Jarvis.

"As ministers, heads of state and thousands of delegates gather in Durban to negotiate a future climate deal, agriculture is making its way up the agenda, but it is still not getting the attention it deserves," said Bruce Campbell, director of the CGIAR Climate Program.

"Food security is the bedrock of global stability and with climate change having such a profound effect on food production, farming must figure prominently in the Durban negotiations," Campbell said. "The research community is developing some exciting ways to deal with both agricultural adaptation and [climate change](#) mitigation, but we need countries to create the right mix of policies and incentives to help move this work forward."

Provided by CGIAR Research Program on Climate Change, Agriculture and Food Security

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