

# Researchers outline food security-climate change road map in *Science*

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While last month's climate negotiations in Durban made incremental progress toward helping farmers adapt to climate change and reduce agriculture's climate footprint, a group of international agriculture experts, writing in the January 20 issue of *Science* magazine, urges scientists to lay the groundwork for more decisive action on global food security in environmental negotiations in 2012.

"Agriculture worldwide is being impacted by climate change and in less than 15 years global population will rise by one billion people," said Sir John Beddington, lead author of the article 'What Next for Agriculture After Durban?' "Policy makers and scientists need to work together, quickly, to chart a course toward a sustainable global food system."

"Many agricultural practices show promise for lowering risks to food production and [greenhouse gas emissions](#) while protecting forests and other natural resources at the same time," said Prof Tekalign Mamo of Ethiopia's Ministry of Agriculture, who spoke at several official events at the Durban gathering. "But existing policies do not sufficiently encourage these sustainable approaches or prepare the [global agriculture](#) sector for climate change."

Beddington and his co-authors noted that the run-up to the December 2011 meeting of the [United Nations Framework Convention on Climate Change](#) (UNFCCC) featured a strong political push to launch a new work program on agricultural climate change adaptation and mitigation under the UNFCCC's Subsidiary Body for Scientific and Technological

Advice (SBSTA). For example, a group of African Agriculture Ministers presented a call for action on climate-smart agriculture in September, as did scientists from 38 countries through their Wageningen Statement in October.

In Durban, many public figures called for action on agriculture including former UN Secretary-General Kofi Annan, South African President Jacob Zuma, former President of Ireland Mary Robinson, and Prime Minister of Ethiopia Meles Zenawi. Over 500 people joined in the third [Agriculture and Rural Development Day \(ARDD\)](#) meeting where Beddington presented key actions for avoiding a future in which weather extremes produce a succession of food crises.

However, integration of agriculture in the climate change negotiating process has moved at a slow pace while climate change and the other forces affecting food security, chiefly rapid population growth, are occurring much faster. "Back in 2009 in Copenhagen, we already had draft negotiating text for agriculture," explained Dr Mohammed Asaduzzaman, Research Director at the Bangladesh Institute of Development Studies, who serves on his country's delegation to the UNFCCC. "It's time for us to take up a SBSTA work program so negotiating parties can weigh the risks and benefits of different policy and financing choices."

Agreements in Durban did open the door to agriculture. Future negotiations will consider "sectoral actions" on climate change, which could include those related to the agriculture sector. Also, a March 5 deadline has been set for submission of evidence to SBSTA which will "exchange views on agriculture." As a major driver of deforestation, agriculture is likely to be discussed as details of REDD+ (Reducing Emissions from Deforestation and Forest Degradation) are negotiated. Beddington and his colleagues called these a "welcome first step," however they view it as far short of what is needed. They call on

scientists to assume a more prominent role in supporting global and national political processes to ensure talks in 2012 are informed by clear data on how climate change imperils food security and what can be done to avoid catastrophe.

In outlining opportunities for scientists to assist UNFCCC negotiations, the authors point to seven policy recommendations issued in November 2011 by the [Commission on Sustainable Agriculture and Climate Change](#). Many of the authors serve on the Commission which Beddington chairs. "Scientists have a responsibility to show decision makers what we mean by 'climate-smart agriculture' and 'sustainable intensification,' and how these strategies are crucial to the success of any global climate change adaptation and mitigation effort," said Dr Adrián Fernández Bremauntz, Advisor on Sustainability at the Metropolitan University in Mexico, and a member of the Commission.

"There are clearly major opportunities this year for scientists to provide the evidence required to rapidly generate new investments and policies that will ensure agriculture can adapt to the impact of climate change—and in ways that mitigate production of greenhouse gas emissions," said Prof Bob Scholes of South Africa's Council for Scientific and Industrial Research, who delivered a keynote address at [Forest Day](#) in Durban where links between forestry and agriculture were highlighted. "Scientists can build on the Durban agreements for REDD+ to clearly describe adaptation and mitigation strategies that span agriculture and forestry and improve food security and livelihoods."

"The window of opportunity to avert a humanitarian, environmental and climate crisis is rapidly closing and we need better information and tools for managing tradeoffs in how we grow our food and use our resources," said Prof Molly Jahn of the University of Wisconsin-Madison. "Urgent action is needed, within and outside of the UNFCCC, to address the threat of climate change to agriculture and food security." Jahn will

share this analysis at a symposium on climate change and food security at the [National Conference on Science, Policy and the Environment](#) in Washington today. Earlier this week, she also headlined at the launch of two new global research initiatives for improved production of maize and wheat led by the [CGIAR Consortium of International Agricultural Research Centers](#).

Jahn and other authors of the *Science* article see a need for more "integrated research" focused on sustainable agricultural practices that are appropriate for "different regions, farming systems, and landscapes," particularly in low income countries where climate change is expected to pose the greatest challenge. The goal, the authors said, is to achieve a "safe operating space" where farmers can produce enough food to meet global needs while adapting to various climatic stresses and also minimizing the environmental impact of food production.

The *Science* article points to several other opportunities for the research community to provide insights that could direct more attention and resources to the critical link between climate change and food production. For example, scientists can help with identifying robust opportunities for investing in agricultural adaptation and mitigation with financing now available through the Adaptation Fund of the Kyoto Protocol, the UN's Clean Development Mechanism and the Green Climate Fund, which has earmarked US\$100 billion for developing countries. They can also assist with inclusion of [agriculture](#) in national action plans for climate change adaptation and mitigation that are being developed under the auspices of the UNFCCC.

Overall, the authors believe scientists must help improve the overall "understanding of agricultural practices that will deliver multiple benefits" in areas of [climate change](#) adaptation and mitigation, global [food security](#), and REDD.

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