CLIMATE RISK MANAGEMENT AND AGRICULTURE

Agriculture is the source of livelihood and sustenance for the majority of the Earth's poor and an engine of economic growth in much of the developing world. Climate risk is a particular challenge for the hundreds of millions whose livelihoods depend on rainfed agriculture in marginal, high-risk environments. Working with a range of partners on several fronts, the IRI seeks to advance and protect rural prosperity through effective management of climatic risk.

A dvances in agricultural technology and policy associated with the Green Revolution saved more lives and did more to reduce hunger and poverty than any other intervention in history, reducing the absolute number of poor and food insecure roughly in half in a period when the global population doubled. Yet its benefits largely bypassed large, marginal, rainfed regions where progress continues to be slowest and poverty is most persistent. While multiple factors contribute, dependence on the variability of rainfall is a common feature. Climate shocks such as drought, flooding or heat waves lead not only to loss of life, but also long-term loss of livelihood through loss of productive assets, impaired health and destroyed infrastructure. The uncertainty associated with climate variability is a disincentive to investment in improved agricultural technology and market opportunities, prompting the risk-averse farmer to favor precautionary strategies that buffer against climatic extremes over activities that are more profitable on average.

The international agriculture community is working aggressively to reduce the technology, market, institutional and policy constraints to agricultural development, but effective management of climate risk remains a neglected yet critical piece of a comprehensive approach to agricultural development. Several recent advances have opened new avenues for managing climate risk in agriculture. The IRI and a growing number of partners recognize that effective management of current climate risk provides a win-win opportunity to contribute



to legitimate immediate development priorities while protecting development from the threat of a changing climate.

Contact

James Hansen Research Scientist Agricultural Systems jhansen@iri.columbia.edu

Ph: +1.845.680.4410 Fx: +1.845.680.4864

International Research Institute for Climate and Society Columbia University Lamont Campus 61 Route 9W Palisades, NY 10964-8000 USA

CLIMATE RISK MANAGEMENT AND AGRICULTURE





Information Services that Empower Farmers

Reducing uncertainty helps farmers to better manage risk. Anticipating and monitoring climate conditions enables farmers to adopt improved technology, intensify production, replenish soil nutrients and invest in more profitable enterprises when conditions are favorable; and to more effectively protect their families and farms against the long-term consequences of adverse extremes. In Uruguay, we helped develop an online information system for farmers based on historic records, satellite information and models. Work in Kenya has led to the design of more useful climate forecast information products, and an effective process for training smallholder farmers to interpret and respond to climate information.

Anticipating and Managing Food Crises

Climate shocks can lead to shortages in both food supply and purchasing power, most visibly for the poor in semi-arid regions of Africa, where many people often subsist on rain-fed agriculture and lack access to societal safety nets. While highly publicized food crises often trigger massive international assistance, delays can greatly diminish their effectiveness in preventing hardship. The IRI works with a range of climate-informed intervention strategies designed to anticipate, and either prevent or better manage emerging food crises. Examples include: working with the U.N. Food and Agriculture Organization to develop mapping tools to monitor desert-locust conditions in Africa; working with CARE Indonesia and other partners to create a more responsive food-security decision-making system based on improved monsoon forecasts in Nusa Tenggara Timur; and working to improve food security early warning systems in partnership with institutions in West Africa and the Greater Horn region.

Innovations in Insurance

Weather index insurance, which bases payouts not on actual agricultural losses but on a meteorological index that is correlated with losses, eliminates some of the problems of information flow and transaction costs that have made traditional insurance unviable for smallholder farmers in most developing countries. In Malawi, the IRI works with the World bank on index insurance implementation that has overcome the aversion of rural banks to lend to rainfed farmers, allowing farmers to adopt improved peanut production technology that provides substantially higher returns in average and good years. The IRI partners with the Millennium Village Project on index insurance designed to protect the gains from ongoing development activities against devastation from drought or flooding.

"Maximizing our use of climate information is extremely important to us because 40% to 50% of our prosperity comes from agricultural production and commodities."

> Augustín Giménez Uruguay's National Agricultural Research Institute, INIA

About the IRI

The IRI works on the development and implementation of strategies to manage climate related risks and opportunities. Building on a multidisciplinary core of expertise, IRI partners with research institutions and local stakeholders to best understand needs, risks and possibilities. The IRI supports sustainable development by bringing the best science to bear on managing climate risks in sectors such as agriculture, food security, water resources, and health. By providing practical advancements that enable better management of climate related risks and opportunities in the present, we are creating solutions that will increase adaptability to long term climate change. IRI is a member of the Earth Institute at Columbia University.