Impacts of Climate Variability and Climate Change on Agriculture and Natural Resources

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Climatologists, agronomists, social scientists, and stakeholders are evolving a framework to integrate what would otherwise be qualitative, anecdotal or sporadic perceptions about impacts of the El Niño-Southern Oscillation and other variability systems on agriculture. The emerging framework encompasses a global array of agricultural users of climate predictions, regional specificity, interdisciplinary analysis, and interactive linkages. The challenge is not just to predict impacts but to provide a sound basis for decisions that can mitigate negative climate impacts and optimize positive ones. Researchers, operational specialists, extension agents, banks, and insurers, among others, are coming together to apply scientific criteria toward achieving realistic solutions to practical problems regarding climate variability and change.

In essence, a new type of global-to-regional extension service is being created, in which atmospheric, biophysical, and social scientists are cooperating with practitioners in agricultural regions around the world to improve climate risk management. This new horizontal network serves an integrating function across the full range of activities related to seasonal climate predictions, from their inception to their aimed-for timely adoption and judicious utilization. This service is driven by an ever-growing understanding of the intertwined systems of climate and agriculture.

There is a correspondence between the useful adoption of seasonal climate forecasts in short-term decision making and the incorporation of the global climate change issue into long-term decision making regarding both mitigation of anthropogenic increases in atmospheric greenhouse gas concentrations (the main cause of global warming) and adaptation to changing climate extremes.
The manifestations of an already changing climate and the prospect of further climate change to come add urgency to the tasks of elucidating the sources of and responses to natural variability in current climate systems and of understanding how potential changes in global-scale features such as ENSO and the other climate oscillations may evolve in the future and affect managed as well as natural ecosystems.

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