Economics, Agriculture and Global Change

Economic Issues in Global Climate Change: Agriculture, Forestry, and Natural Resources.
Edited by John Reilly and Margot Anderson
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Research on global climate change has been spurred by the increasing acceptance that human activities have induced climate change. Uncertainties in the physical science of climate change are significant. There is considerable uncertainty as to the relationship between the release of “greenhouse gases” and their accumulation in the atmosphere as their life and potential to be absorbed by the sea remains uncertain. Greenhouse gases, such as CO₂, CH₄, N₂O, and CFC’s, allow radiation from the sun to reach the earth but hold back the heat that would normally radiate into space (radiative forcing). Some argue that, despite greenhouse gas accumulation, the extent of climate change will be much less than forecast because cloud cover will increase with temperature and reflect solar radiation away from the earth. These arguments aside, significant uncertainties remain as to the rate and geographic distribution of climate change thus complicating economic analyses on global change. Given the popular acceptance of human-induced global climate change has come only recently, it is not surprising that economic analysis in the area is in its infancy.

The economist interested in impacts of global climate change in any sector of the economy will find portions of this book very helpful. The book begins by covering the science of global change and explains many commonly used terms. Additional topics covered include the north-south debate (richer countries can afford adaptations to climate change more than poorer ones), efficiency versus equity (do future generations have an adequate say in determining the rate of greenhouse gas emissions?), and control of trace-gas emissions and devising an optimal trace-gas index (where the life, radiative forcing, ozone depletion and other environmental impacts of a greenhouse gas are considered). The reader will notice that issues raised by the author(s) of one chapter may differ philosophically with work author(s) of other chapters. Consequently, the reader realizes the extent of issues debated in economic analysis of climate change.

Reilly and Anderson attempt to provide a “starting point for researchers who are evaluating the economics of global change” and I believe they have succeeded for economists concerned about global change and agriculture. However, having “Agriculture, Forestry, and Natural Resources” in the title wrongly suggests comparable coverage on the effect of climate change in each of these areas.

The coverage of agriculture is to be complimented. Economists interested in initiating research on global climate change and its effect on agriculture will find these chapters a good place to start. Theoretical models, empirical studies, and the need for additional data are all discussed. Furthermore, chapters dealing with other physical (e.g., increased weather variability) and social (e.g., uneven distribution of impacts) considerations offer a near complete background for the beginner.

The coverage of forestry is limited. Only two of the four chapters in the forestry section focus directly on forest management under a changing climate. The other two forestry chapters look at forestation of agricultural lands as a means of sequestering carbon and, therefore, are chapters well worth including as an agricultural topic.

The coverage of natural resource issues is limited to agriculture’s and forestry’s dependance on resources. There is no valuation of global climate change impacts to the recreational uses or preservation of natural resources. This is not to say that authors of some chapters do not recognize that these values exist. For example, Bowes and Sedjo point out that forested areas in the Midwest may have a greater value as a recreational resource than as a forestry resource, and Easterling, et al point to the potential conflict between water demands for fish and wildlife and water demand of agriculture.

The editors are not providing a product for the policy maker but for the research economist. However, policy makers could benefit from the chapter by Lewandrowski and Brazee who provide a clear, concise, and not-too-technical argument on the importance of allowing farmers greater flexibility in cropping practices to more efficiently adapt to climate change. This strikes me as an especially important point for two reasons. First, adapting farm programs as the climate changes relies on a political consensus recognizing a change. However, because climate change is a
gradual process thus making it difficult to recognize, program adoptions may never be made (There are those who do not believe that climate is changing) Second, flexibility encourages farmers and input suppliers to be more innovative so that impacts of climate change to agriculture can be reduced

The reader may want to read chapter 21 before the earlier chapters that deal with quantitative assessments of the impacts of climate change. While writing it as a review chapter, Sonka focuses primarily on outlining an effective framework for evaluating strengths and weaknesses of quantitative assessments. When read before the quantitative chapters, the reader will gain a better perspective of the purposes, strengths, and relevance of the empirical work.

Reilly and Anderson “attempt to rectify the scarcity of economic analysis within the global change debate.” The economic analyses of climate change presented are all still in progress. Given recent beginnings of economic analyses in this area, it is not surprising that no single chapter tackles the estimation of climate change impacts given the interrelationships between local, national, and international productivity and market impacts. However, the reader will find that, together, the chapters dealing with the economic impacts of climate change to agriculture cover approaches in each of these areas. One can criticize any of the climate change impact analyses for not being more inclusive or for being too narrow in scope. However, research in this area has just begun. While these chapters do not provide policymakers with specific numbers for policy implementation, they do offer economists a blueprint to draw upon.