CLIMATE CHANGE AND MID-LATITUDES AGRICULTURE: PERSPECTIVES ON CONSEQUENCES AND POLICY RESPONSES

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Abstract. Because of population growth, economic development, and technological change, world and mid-latitudes agriculture will look very different than they do today by the time $2 \times CO_2$ climate change begins to have major impact. It does not appear that that impact would seriously restrain the growth of world agricultural capacity. However, significant shifts in regional comparative advantage in agriculture would be likely. Because the consequences of $2 \times CO_2$ climate change for agriculture would vary among countries – some suffering losses, others seeing themselves as potential winners – these consequences could impede international agreements to control climate change. However, even countries gaining agricultural advantage from climate change will need changes in policy to capture the gains. And policies to lessen the costs to the losers will be essential. If global warming continues beyond that associated with $2 \times CO_2$, all countries in time would be losers.

Introduction

I take as a point of departure the consensus among atmospheric scientists and modelers that continuation of present trends in emissions of $CO_2$ and other radiatively active trace gases will gradually increase global average temperatures of the troposphere 1.5–5.5 °C by sometime in the second third of the 21st century, the increase being greater in the polar regions and less at the equator (Bolin et al., 1986). Given these temperature increases and related changes in global and regional climates, I ask two questions: (1) what policy issues will the consequences of these changes for mid-latitudes agriculture raise for mid-latitudes governments? (2) what strategies should these governments be considering for dealing with the consequences?

Identification of Policy Issues

Underlying Assumptions

The major climate consequences of the prospective 1.5–5.5 °C increase in global average temperature will occur beyond the lifetime of most people now in policy positions in mid-latitudes governments. To say that these consequences will pose, or should pose, policy issues for these people is to assume that they accept, or should accept, some responsibility for the welfare of not only the next generation
but also of generations not yet born. It is not obvious that the assumption is generally valid. The tendency of elected officials to heavily discount events occurring beyond the next election is notorious. Even those who in principle accept a responsibility toward the future may believe that with prudent tending on their part, economic growth will provide generations to come with the knowledge and other wherewithal needed to deal with whatever problems our generation may impose on them.

Such attitudes undoubtedly exist among policy people in mid-latitudes (and all other) governments, but it is not obvious that they predominate. If any event, if one is to fruitfully discuss policy issues presented by climate change one must assume that policy people share, or can be persuaded to share, one's view that such issues are, or soon will be, upon us.

I make a second assumption: that the concepts of social benefits and costs provide useful guidelines in seeking to identify policy issues raised by climate change. Questions have been raised (Ausubel, 1983) about the usefulness of economic analysis for addressing these issues, and benefit-cost concepts are very much part of economics. Three principal objections have been raised. One is that many of the costs and benefits of climate change are unpriced, e.g. habitat values lost or gained, hence they cannot be adequately captured in a cost-benefit calculation. Another objection is that the discounting of future events which is integral to cost-benefit analysis will reduce most of the consequences of climate change to insignificance because they occur 50 to 100 years or even further in the future. Yet no rational person of our generation will accept, for example, that the consequences of a 6 m rise in sea level would be insignificant because it would occur 150-200 years from now.

The third objection, related to the first two, is based on awareness that we face vast uncertainty about the long-term consequences of climate change but that some of the consequences, e.g. sea level rise, could verge on the catastrophic in some important regions of the world, e.g. Bangladesh. A strict application of benefit-cost analysis to a situation combining such high uncertainty with the potential for such severe, perhaps irreversible, damage would be a child's game, not to be taken seriously by serious people.

I fully accept these objections to the strict application of benefit-cost analysis to consequences of climate change. Nevertheless, whatever policies mid-latitudes governments adopt to deal with climate change, whether to avert it or adapt to it, will cost something. In the strategic thinking needed to sort out the more promising policies, governments must consider the costs of the alternatives, even while recognizing that attempts to quantify all the costs would be a waste of time and resources. Similarly, in this strategic thinking governments must consider the benefits, in damages averted, of alternative policies, again recognizing the pointlessness of seeking quantification of the benefits. It is in this broad qualitative sense that I urge the usefulness, indeed the essentialness, of the concepts of benefits and costs in strategic thinking about policy responses to climate change.