

THE ECONOMICS OF CLIMATE CHANGE

Questions

- **What are the impacts of climate change?**
- 2. **How should they be addressed?**
- 3. **How will the magnitude and timing of climate change be affected?**

(1) Studies on Economic Impacts of Climate Change On agriculture

- **Results of economic studies depend on scientific knowledge. Scientific uncertainties \Rightarrow economic impact uncertainties.**
- **There are several lines of modeling. They differ in:**
 - Incorporation of uncertainty
 - Incorporation of variability and spatial heterogeneity.

Modeling Approach

a. Hedonic Price Models (Mendelsohn, AER).

Premise:

- **Impacts of climate change will be reflected in asset values.**
- **Current asset prices can be used to estimate the price sensitivity of land values to changes in climate parameters.**
- **Various assumptions about changes in climate conditions are used to estimate impacts of climate change on land values.**

b. Programming Simulations (Adams, McCarl)

Premise:

- **Agronomic estimates of impact on climate change on yields and cost at different locations under various conditions are used to estimate changes in land use choices at various locations.**
- **Optimal output supplies and input demands are computed using the land-use estimates.**
- **Equilibrium prices, output levels, and profits for different regions are then derived.**
- **Assumptions about international trade price supports vary among studies.**

c. Stochastic Simulations (Segerson-Riley)

- **Consider impacts of estimated changes in means and variability indicators (e.g., impacts of climate change on average temperature and distribution of seasonal and daily temperatures) on yields and profitability at various locations.**

d. Regional Case Studies (Doering)

- **Interdisciplinary--combine quantitative estimates with expert interviews to assess response to changes.**

Lessons:

- **Without considerations of variability, overall impacts of climate change are not overwhelming (a 5 to 15 percent increase or decrease in agricultural income and profitability of agriculture).**

- **Distributional impacts may be much more significant than overall effects.**
- **Production patterns will shift 100-200 miles northward.**
- **Impacts in the middle of regions will be smaller than in the periphery.**
- **The livestock sector is more likely to lose, while crops may gain.**
- **Water resources will become more valuable.**
- **Uncertainty about climate change will slow investment in vulnerable regions and enhance value of projects that will dampen the impact of climate change.**
- **The value of climate monitoring and predicting technologies as well as value of water-saving technology increases.**
- **Possible increases in seasonal and daily variation in weather may lead to significant income losses.**
- **Snowmelt will increase flood risks and worsen seasonal supply of water.**
- **Relocation and adjustment costs may be significant.**
- **The cost of adjustment depends on speed of change. Gradual changes can be handled easily; brisk changes are a source of concern.**

Limitations of Current Research

- **Underemphasis of research on global agricultural impacts of global climate change. How will climate change affect trade and LDCs?**