

Participatory Integrated Assessment of Climate Change Impacts and Adaptation: The Tradeoff Analysis Approach

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Many assessments of climate change impacts and adaptation use the results of global circulation models and aggregated production data. These methods are unable to represent the spatial variability and temporal dynamics in production systems that are essential to understanding climate impacts, vulnerability, and potential for adaptation to mitigate the impacts. Moreover, integrated assessments are typically done in a top-down manner with little or no input by stakeholders. In this presentation we describe a participatory approach – Tradeoff Analysis (TOA) – to the assessment of climate change impacts and to the design and assessment of adaptation strategies that incorporates the spatial variability and dynamics of farming systems. TOA is a process designed to bring together stakeholders and scientists in workshops where the participants identify quantifiable indicators (e.g., farm income, water quality, food quality) that can be used to assess the status and sustainability of the agricultural systems and their broader social impacts. The participants are asked to hypothesize how these indicators may be inter-related (in terms of tradeoffs or win-win outcomes), and to identify possible technology and policy scenarios that could lead to positive changes in the indicators. Based on this information, an appropriate scientific team is constituted representing the relevant fields of science. This team then carries out an appropriate quantitative analysis of options, using the available data and modeling tools. For the implementation of the quantitative analysis, the Tradeoff Analysis Software is available which integrates spatially-referenced data with crop and livestock simulation models, economic simulation models, and environmental impact assessment models. The final step in TOA is a joint evaluation of the modeling results by the stakeholders and the scientific team. The spatially-explicit analysis allows the research team to quantify the spatial distribution of impacts, and can be communicated to stakeholders and the public using various media including maps.

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