



C2: Advancing the Economic Assessment of Climate Change. Gaps and future research

Host: **Enrica De Cian** (*Fondazione Eni Enrico Mattei (FEEM), Italy*)

Co-hosts: Ramiro Parrado (*FEEM, Italy*), Amsalu Woldie Yalew (*PIK, Germany*), Hermann Lotze-Campen (*PIK, Germany*)

Rapporteur: Amsalu Woldie Yalew (*PIK, Germany*)

Summary of themes covered in workshop

The workshop focused on topics related to missing categories of impacts, limitations in existing economic modeling approaches, and recommendations for the future research.

Most controversial question that came up in this workshop?

Although the disconnect between biophysical and economic models has been blamed as one of the causes for underestimating the economic impacts of climate change for more than 10 years, yet improvements in the economic assessment of climate costs are not as we expect. What is missing yet?

Results of the discussion

1. Economic models and modeling analyses that include: A) interactions with different environmental problems (e.g. climate and air pollution), B) interactions among climate change impacts across different sectors, C) short-term effects, and D) probabilistic nature of impacts improve the estimates of the 'true' economic costs of climate change.
2. Assessing economic impacts of climate change using CGE models shall be strengthened as CGE models has special position as: A) they fall between IAMs and partial equilibrium models, B) can be applied at different scales (global, national,

subnational), and C) have been used in the past decades for assessing single and/or multi-sectoral impacts, but they still can be improved.

Research gaps identified

1. Economic modeling ought to strive to include and quantify the economic impacts of: A) Large-scale disruptive events, B) Short-lived and local extreme events, C) Persistent shocks on economic growth rates, D) Probabilistic nature of climate change impacts, E) Transitional/adjustment costs of migration, F) Health expenditure, labor supply, and labor productivity, G) Ecosystems, especially, of non-market aspects of ecosystems that are directly consumed by households
2. Limitations and gaps are identified in A) assessing the interactions of different biophysical climate change impacts in the economy, B) linking the results of biophysical impact models through different economic modeling approaches, C) calibrating short-lived and local climate-related effects (e.g. crop yield changes, impacts of natural disasters), D) aggregating over sectors and space, and E) modeling the trade-offs and synergies between mitigation and adaptation and the failure to adapt and to mitigate

Next steps

1. Economic modelers can take stock from climate (e.g. CMIP) and biophysical impacts (e.g. AgMIP, ISIMIP) initiative for model inter-comparisons and start a platform for modeling inter-comparison and improvement consortiums.
2. Support a coordinated effort among bottom-up biophysical models and Top-down economic models to improve the representation of climate change impacts interactions.
3. Modeling adjustment costs of migration and improving approaches to deal with climate change health impacts.
4. More research using spatial models is required.

Other

1. It is acknowledged that economic models are optimistic about adaptation than biophysical scientist.
2. There is room to improve modeling the economic impacts of climate change if time, energy, and resources are invested given the accumulated experience over the two decades.

3. A question on communicating scientific results to policy-makers was raised. Are there any improvements and developments in communicating economic impacts of climate change to influence the policy-and-decision makers after the Stern Review?

3-5 keywords that characterize the session

Climate change, Natural disasters, Economic impacts, Economic modeling, Interactions and interlinkages of impacts