OECD Expert Meeting
on
Climate Change, Agriculture, and Land Use:
Matching modelling approaches to policy questions

Paris
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Final Agenda

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Location: OECD
Conference Centre – Room CC15
2 rue André-Pascal
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Registration:

This will be a technical meeting. Delegates to the Joint Working Party on Agriculture and the Environment are invited to register via their Delegation to the OECD (EMS system) or to propose country experts. Other participants, by invitation only, should contact the OECD. There is no cost for registration; however participants are responsible for covering their own expenses.

Participants

We envisage participants from member country delegation to the OECD Joint Working Party on Agriculture and the Environment, experts to be designated by country capitals, Secretariat staff from OECD, and invited speakers. We encourage delegations to designate participants who are experts in the fields of climate change and environmental economics. Participants will be responsible for covering their own expenses (travel, accommodation, and per diem).

Motivation of the Expert Meeting

This meeting will explore the role of policy in addressing issues pertaining to climate change, agriculture, and land use both in the context of GHG mitigation and of farmer adaptation to climate change. More specifically, the intended outcome of the meeting is to have a clear idea of the policy questions OECD should be focusing on, and which analytical tools are appropriate to address such questions. Through this expert meeting the OECD Secretariat intends to prioritize future OECD work based on the outputs already generated by the Secretariat, the resources available, and the comparative advantage the Secretariat may have relative to research and analysis already taking place outside of the Secretariat.

The OECD Secretariat's mandate is based on the Ministerial Meeting that took place in 2010, and the Program of Work and Budget for 2011-12. In the Policy Principles for Food and Agriculture Ministers agreed that:

"climate change presents challenges and opportunities for the agricultural sector in reducing green house gas emissions, in carbon sequestration, and the need for adaptation […] and that governments should ensure that incentives and disincentives can be effectively and transparently designed to reflect the total costs and benefits to society […] facilitating adaptation to and mitigation of climate change."

Ministers asked the OECD Committee for Agriculture to contribute to a better understanding of the nature and magnitude of the challenges and opportunities facing the sector and to mainstream responses to them in its on-going core work. In this respect they requested that OECD: (i) distinguish areas where farmers and the agro-food sector can address challenges and exploit opportunities on their own, from areas where government policy responses might be required; (ii) analyse the likely impact of climate change on agriculture and on agro-forestry, the role of the sector in mitigation and adaptation, and the appropriate policy responses.

In parallel to the mandate OECD has received by Ministers, international policy discussions indicate an increasing attention to the link between agriculture and climate change, as demonstrated by recent UNFCCC Climate Meetings and the availability of funds for ambitious research projects (e.g. the Climate Change, Agriculture and Food Security by the CGIAR). Despite an increase in the visibility of the topic there is still work to be done in outlining the role of agriculture and land use in a broader climate policy agenda that has traditionally focused on other sectors of the economy.

To provide input into the policy process the expert meeting intends to discuss a set of pending questions and the analytical tools that are most appropriate to answer such questions. Different aspects of the topic relating to **climate change mitigation** that could be addressed in the expert meeting:

- One aspect could be the specific challenges faced by agriculture to participate in inter-sectoral climate policy, such as aspects of measurement of non-point emissions, and linking mitigation actions to actual emissions reductions. Analyses providing insight on how to overcome these challenges could be useful in advancing a coherent inter-sectoral climate policy since agriculture contributes to approximately 14% of emissions, and land use-change another 17%.
- Meeting higher global food demand will require considerable improvements in agricultural productivity from a potentially shrinking natural resource base. The pressure on land will increase with the ongoing dietary trend towards more animal protein and due to competition from the fuel industry for biomass. Agriculture is therefore just one of several possible competing land uses for food, fibre, timber, and bio-fuels. What policy framework is necessary to meet competing demands for land in the context of Agriculture, forestry, and other land uses (AFOLU) in a way that is

efficient and incorporates environmental externalities? What type of analyses can facilitate the implementation of a comprehensive AFOLU policy framework?

- Another example of policy insight that could be useful concerns intra-sectoral policy, comparing the different agricultural GHG mitigation options and analyzing which ones are the most robust from and economic perspective and in terms of environmental outcome. Mitigation options in agriculture range from manure management to soil carbon sequestration. Analyses of costs and uncertainties involved in the range of available options can be useful in targeting incentives to the most effective and efficient options.
- Climate Policy needs to take an inter-temporal perspective due to the long-term nature of potential climate disruption. What is the potential role of agriculture in limiting climate change to 2050? How will this role evolve over time as other GHG mitigation technologies become economically viable?

Although farmers have routinely and successfully adapted to changes in weather and climate, the strategies adopted in the past are unlikely to be enough to cope adequately with the impacts of future global climate change. Different aspects of the topic relating **farmer adaptation to climate change** that could be addressed in the expert meeting:

- *Resilienc*e refers to the ability of a system or entity to absorb disturbances while retaining its essential character and functionality. What is the role of government in providing an appropriate policy environment so that adaptation results in an efficient, productive and resilient agriculture?
- Given that adaptation is specific to particular circumstances, what type of analyses can guide policy design so as to provide the right signals and incentives for farmers?
- Can large-scale simulation models be useful in providing insight in the longer-term perspective needed for planning adaptation strategies over a longer time horizon? Or is adaptation mostly a risk management problem addressed with other tools?
- What type of analyses can capture the role of government in strengthening the information chain from research to farmers, via public extension services and policy measures?

These and other policy questions may arise in the discussion during the meeting. The intention is to identify those questions on which OECD should focus its resources and determine the appropriate analytical tools to address the questions.

Expected outcome

The output of this expert meeting will be used to structure the analytical component of OECD Secretariat's program of work on climate change and agriculture. The intended outcome of the meeting is to have a clear idea of the policy questions OECD should be focusing on, and which models are appropriate to address such questions. Areas of collaboration with other institutions will be explored. A summary of the Expert Meeting will be circulated.

Invited speakers

Sherman Robinson - International Food policy Research Institute (IFPRI) and University of Sussex
The economics of climate change: appropriateness of partial and general equilibrium approaches

Emanuele Massetti (Fondazione ENI Enrico Mattei –FEEM)
The economics of climate change impacts on agriculture: ongoing work using Ricardian approaches

Christian Troost (University of Hohenheim)
Insights for climate change policy from agent-based modeling of land-use

Ben Henderson (FAO)
A CGE approach to modeling climate change policy in agriculture

Agenda

	TIME	SESSION
	09:00-09:30	Registration
	09:30-10:30	**Session 1: Framing and prioritizing policy questions concerning climate change, agriculture, and land use**
		Chair: Andrea Cattaneo • *Introduction* (Andrea Cattaneo – OECD) • *Summary of outcome of workshop on Climate Change and EU agriculture* (7-8 February, 2011 in Brussels) - Christine Moeller, EU Commission – DG Climate Action [5-10 minutes] • *A preliminary set of policy questions for discussion* (Wilfrid Legg– OECD)
	10:30-10.45	*Coffee Break*
	10:45-12:45	**Session 2 : Matching Modelling approaches to Policy Questions**
		Chair: Hsin Huang • *The economics of climate change: appropriateness of partial and general equilibrium approaches* Sherman Robinson - International Food policy Research Institute (IFPRI) and University of Sussex [20 minutes] • *The economics of climate change impacts on agriculture: ongoing work using Ricardian approaches* Emanuele Massetti (Fondazione ENI Enrico Mattei –FEEM) [20 minutes] • *Insights for climate change policy from agent-based modeling of land-use* Christian Troost (University of Hohenheim) [20 minutes] • *Discussion*
	12:45-14:00	*Lunch*

	TIME	SESSION
	14:00-16:00	**Session 3 : Structuring the OECD work program and potential for external collaboration**
		Chair: Andrea Cattaneo • Summary of OECD outputs and ongoing activities relating to agriculture and land use **Andrea Cattaneo (OECD)** [10 minutes] • *Introducing land use in OECD's ENV-LINKAGES model* **Rob Dellink (OECD)** [20 minutes] • *A CGE approach to modeling climate change policy in agriculture* **Ben Henderson – FAO** [20 minutes] • *Using medium-term models to analyze GHG emission mitigation policies in agriculture* **Ignacio Perez (OECD)** [20 minutes] • *Discussion*
	16:00-16:15	*Coffee Break*
	16:15-17:30	**Session 4 : Wrap-up and conclusions**
		Chair: Frode Lyssandtrae, Senior Advisor, Ministry of Agriculture and Food, Norway On the basis of discussions in this expert meeting, this session will draw out the key insights, prioritize analytical work to be done at the OECD Secretariat, and build potential future collaborations with other institutions carrying out analysis that is of interest.

A Brief Summary of OECD Outputs and planned Activities

(A) Mitigation

Background and Context Papers

The Secretariat presented papers on a number of issues related to GHG mitigation:

- Climate Change and Agriculture: Impacts, Adaptation and Mitigation,
- Mitigation of GHGs: Economics of Carbon Sequestration in Agricultural Soils,
- Land-use Change- Implications for Climate Change Analysis, focusing on land use and land cover change data
- Life-cycle Analysis of Biofuels and Land-Use Change,
- Greenhouse Gas Emissions in the Livestock Sector

These papers are available from the Secretariat upon request.

Analytical work

As reported in the 2011-12 Program of work and Budget the AGLINK-COSIMO model (or other models available in-house) and medium term baseline will be used to examine the impact of pricing carbon emissions from agriculture. This quantitative analysis will look at the impact on agricultural commodity prices, production and trade of different levels of carbon pricing. The scenarios are meant to be illustrative in nature and include all OECD countries and selected large non-OECD countries such as Argentina, China, Brazil and Russia**.**

The Secretariat is also thinking ahead about potential analytical tools that could be useful, and the analyses we could carry out with them. Potential modelling efforts being considered that could provide new insights on how climate change interacts with the production of food, fibre, timber, and bioenergy are:

- **Global modeling** – It is possible to adopt an existing Global Computable General Equilibrium (CGE) model that has been calibrated using data derived from the Global Trade Analysis Project's (GTAP) database. Two options exist in-house to undertake such modelling: (i) GTAP-PEM developed by the Trade and Agriculture Directorate to address questions of agricultural trade policy, and (ii) the ENV-LINKAGES model developed by the Environment Directorate to analyze global policies for climate change mitigation, and currently being expanded by introducing land-use change in the model. Another option would be, the GLOBE model developed by McDonald, Thierfelder, and Robinson (2007),
- **Country Case Studies** – Models that are country-specific can typically include more detail on land use and agriculture thereby answering more targeted questions relating to climate change. Some models can also be scaled down to a geographic scale where analysis on adaptation could be undertaken. An example of this approach could be a case study of agriculture and land use change in Brazil**.** A regionalized Computable General Equilibrium (CGE) model of Brazil is available in-house at the Secretariat to examine how future trends in demand for food, fibre, and biofuels will play out in one of the major agricultural producing countries. Examples of issues that can be analyzed are: (i) the effects of technological change in cattle production *outside* the Amazon region on agricultural expansion *within* the Amazon, (ii) the effects of policies targeted to reduce Amazon deforestation, and particularly their effects on land-use change in cerrado areas, (iii) the effects of increases in the prices of biofuels or of public policies supporting biofuel

production (iv) the introduction of a national cap-and-trade architecture that would include land-use change.

(B) Adaptation

The Secretariat organized a workshop in Rome, June 2010: "Joint OECD-INEA-FAO Workshop on Agriculture and adaptation to Climate Change". The presentations can be accessed at: http://www.oecd.org/document/4/0,3343,en_2649_33791_41711812_1_1_1_37401,00.html. Following up on this experience, an expert meeting (1-2 days), jointly chaired by OECD/FAO is proposed to be held in Paris in 2011 (June 23-24, to be confirmed) on the topic of "Building Resilience in the Agricultural Sector".

The Secretariat has presented papers on a number of issues related to agriculture's adaptation to climate change (available for the Secretariat on request):

- Agriculture and Economic Adaptation to Climate Change
- Sustainable Management of Water Quality in Agriculture
- Sustainable Management of Water Resources in Agriculture

There is also a planned OECD review, in the 2011-12 PWB (*3.2.3.1.3 Land and Water Resources)*, of the practices and technologies in agriculture to improve the distribution, use and conservation of water. The plan is to examine how climate change is likely to impact water resources and quality in OECD countries, drawing out the implications for agriculture. This work will attempt to draw out how global climate change, water and agriculture trends might influence global changes in agricultural markets and food security, with the likely implications for OECD countries.

The Secretariat has produced a scoping paper (for the Dec 2010 Joint working Party on Agriculture and the Environment on "The Role of Crop Insurance and Farmer Incentives to Adapt to Climate Change". As part of the risk management project, we are proposing to analyze how policy levers affect farmers' risk management strategy and their adaptation to shifts in the probability distribution of weather patterns

In terms of future work, one area that has not been investigated that could provide policy insight is the use of agent-based simulation models to examine adaptation strategies and how they are affected by policies. Since we have no in-house capacity in this area, this work would be commissioned by the Secretariat to a consultant.

(C) Synergies between Mitigation and Adaptation

Background and Context

The Secretariat has presented an overview paper on "Farmer Behavior and Management Practices in Relation to Mitigation and Adaption". The Secretariat has prepared a scoping paper on "Building Resilience in the Agricultural Sector", proposing to analyse how government policies can assist farmers in adapting to the impacts of climate change. An important aspect of adaptation is the synergies and/or trade-offs with mitigation. While the literature suggests there are a broad range of options that improve the economic performance of the farm while at the same time mitigating GHG emissions, regional and local biophysical conditions are key.

Given the diversity and biological complexity of agricultural systems complicates our ability to deliver generic messages, one way forward is to pursue a number of case studies that cover a broad range of agricultural systems in different geographical locations and climatic conditions around the world. This is already proposed in the scoping paper described above in 3c), but only for a limited number of countries (given resource limitations).