



Mitigation Action Plans & Scenarios

# AGRI LAB – WORKSHOP

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The analysis of mitigation actions in the agriculture sector workshop (Agri Lab) took place on 15 – 17 February 2012 in Bogota, Colombia. It followed a direct request by MAPS countries. Participants from three MAPS countries (Chile, Colombia and Peru) attended the workshop.

## Workshop Objective

To understand options and challenges for analysing mitigation actions in the agricultural sector within the context of MAPS country processes, including data requirements and the suitability of tools.

## Overview of Highlights

- ▶ **The importance of the agriculture sector in defining mitigation strategy** given its social and economic implications in Chile, Colombia and Peru including its contribution to GDP, employment, food security and poverty.
- ▶ **Agriculture-related emissions contributions are significant** in all these countries. However, emissions are distinct from mitigation and further research is needed to better understand mitigation potential. Mitigation potential needs to be understood in terms of the overall development plans within a country.
- ▶ **Sectoral baselines or reference scenarios are crucial** in identifying the largest emissions mitigation potential within the sector. These scenarios should assess expansion of the agriculture frontier, the export profile of the country and international trends in food prices.
- ▶ **Improvement in efficiency of agricultural production is a common driver for mitigation action** in the sector. However although emissions per unit of product could decrease through efficiencies, absolute emissions may grow due to an increased production. For example, in Colombia the sector is considered key in the country's growth plans.
- ▶ **Lack of data, country specific tools and methodologies**, is a major barrier to mitigation action in the sector. Challenges arise due to the inconsistencies between data used to compile GHG inventories in the sector (usually Tier 1 data), and data required to explore the costs and benefits of mitigation actions.

- ▶ **The modelling of emissions and mitigation actions in the agriculture sector is different from common approaches used in the energy sector.** It is difficult to use a single model to address all the emission sources of the sector as it has a complex set of activity and data ranges across a country. The spatial specificity of agricultural activities is one reason why system models are less commonly applied in this sector. Although interactions exist, they are less obvious than in the energy sector. However, some 'whole-farm' models are available (see below).
- ▶ **'Whole farm' models can be used to simulate the impact of various strategies at farm level,** on GHG emissions, including livestock and crop activities as well as waste management and power auto-generation. These models allow the user to do an integrated assessment, treating several agriculture activities as a system. Whole farm models are used at national-level to assess GHG emissions for inventory purposes. Its suitability for exploring nation-wide mitigation actions can be compromised by the fact that nation-wide averages would be used, and these would not reflect the reality of the emission sources spread across the country.
- It is possible to combine information from an energy system model with spreadsheet models for agriculture and other non-energy sectors,** as long as care is taken in combining the reference case in a consistent manner.
- ▶ **A number of models, both empirical and conceptual, exist to analyse emissions from livestock,** in particular the methane from enteric fermentation (the largest GHG source associated with livestock activities). Complexities of the models, and accuracy of results, vary significantly and much depends on data quality. In general terms, the use of standard emission factors would be recommendable with simple empirical models, as accuracy would not improve with more complex models.
- ▶ **Very few models presented for the agriculture sector could directly assess mitigation actions.** It is generally required to compare two different situations in order to understand the reductions from the interventions.
- ▶ **Matching the objective of the assessment with model and data availability is key** in selecting agricultural models. For instance, first identifying

the main mitigation action to explore, then selecting the models.

- ▶ **Natural and traditional options should be prioritised over expensive and technology-driven solutions** when selecting mitigation actions. Most of the strategies to improve agriculture production generate a reduction in emissions, and (non-climate) policies are already in place to action these strategies. Mitigation action in the sector often requires behaviour changes in farmers which can be challenging to achieve.
- ▶ **NAMAs in the agriculture sector have not been developed as extensively as in other sectors.** Lack of experience with CDM projects in the sector, lack of capacity to engage the rural community, lack of data and access to funding have been identified as possible reasons why. Other initiatives (like MAIN) are working on NAMAs in general, but also have no special focus on the agriculture sector. There is a strong urge to build capacity on this, and MAPS countries could play an important role.

## Reflections

Agriculture is a key sector in all the MAPS countries that attended Agri Lab; important in terms of job creation and poverty alleviation, food security and contribution to economic growth. Most agriculture emissions come from enteric fermentation and agricultural soils, with some minor contribution from rice cultivation and manure management. MAPS countries have different GHG compositions, potentials and priorities for mitigation within the agriculture sector.

The strategy for the agriculture sector within the MAPS process therefore needs careful consideration, including the choice of the model or analytical approach. There is no broadly used approach or tool for the sector; specific models are used for specific objectives (GHG inventories, management of farms, research on specific emission sources, etc.). System models would be desirable for the objectives of MAPS. However, these models are mostly used at farm level or for GHG inventories. The level of detail required to explore real mitigation potential is not compatible with models designed to cover nation-wide inventories.

## Next steps for MAPS

- **The selection of agricultural models** within MAPS should be done according to the type of mitigation action that can deliver the largest emissions reductions in the country. Identification and preliminary assessment of mitigation action should therefore take place before the selection of the model. A second important criterion is data availability. Complexity of the dataset input varies across the different models, and data quality is a point of issue in this sector. One needs access to appropriate input for the chosen model. Comparability with other sector results could facilitate the selection of tools for the agricultural sector.
- **Further investigation is needed on sector-wide models**, in particular, those based on economics. Interactions within agriculture as well as with other sectors such as forestry and energy, need to be better understood. The linking between the assessment of the mitigation action in the sector and the economy-wide analysis is important because of the role of the agriculture sector in contributing to GDP, job creation and poverty alleviation.
- **Increased technical collaboration on agriculture within the MAPS** community would be beneficial. Access to country experts (which could be facilitated by the MAPS intranet), as well as the sharing of data and approaches, are considered key. A proposal for a joint paper comparing agriculture Mitigation Actions within the MAPS countries has been positively received by the community. The Energy Research Centre (University of Cape Town) will lead on this. In addition to MAPS community collaboration, engaging with other institutions and experts offers great potential for successful research work in this sector – New Zealand and United States have been identified as the most experienced countries in the field, as well as multilateral organisations such as the Food and Agriculture Organisation (FAO) of the United Nations. The contribution from agricultural model developers and experienced users at the workshop was most valuable.

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## MORE ABOUT MAPS

**Mitigation Action Plans and Scenarios (MAPS)** is a collaboration amongst developing countries to establish the evidence base for long term transition to robust economies that are both carbon efficient and climate resilient. In this way MAPS contributes to ambitious climate change mitigation that aligns economic development with poverty alleviation.

**Central to MAPS is the way it combines research and stakeholder interest with policy and planning.** Our participative process engages stakeholders from all sectors within participating countries and partners them with the best indigenous and international research.

**MAPS grew out of the experience of the Government mandated Long Term Mitigation Scenarios (LTMS) process** that took place in South Africa between 2005 and 2008. The LTMS, with its home-grown stakeholder-driven approach, its reliance on scenarios and the rigour of its research and modelling were key to its approach. The LTMS informed South Africa's position for Copenhagen and is the base of much of the country's domestic policy.

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