

Summary of Deliverable D6.3 - Stakeholder workshop on transferability, usability and functionality of the MIND STEP toolbox.

Over the past three years, the MIND STEP project has developed a modeling toolbox for analyzing EU agricultural and environmental policies. In this development, MIND STEP collaborates with representatives of the European Commission, researchers and NGOs to address stakeholder needs and promote transparency.

During the third workshop on October 26-27, 2022, the MIND STEP team introduced the MIND STEP toolkit and presented the first results. The main objective of the workshop was to get substantial input from experts to improve the simulation activities. The workshop relied on a co-creation approach, where stakeholders are actively involved in the decision-making process to bring their perspectives and requirements to the research. A total of 29 stakeholders from policy, research, and environmental NGOs participated in the workshop. On both days, after the presentation of the scenarios and the results of the MIND STEP toolbox, participants divided into three focus groups to discuss the (1) assumptions and results of the scenarios, (2) management and technology, and (3) policy design.

Model results and focus group discussion Day 1 (S1)

Scenario 1:

Chemical input use reduction - Investigate policies to reduce nutrient losses in agriculture, such as restrictions on fertilizer use or implementation of a fertilizer tax.

The results of the MIND STEP toolbox focus on economic farm indicators and nitrogen use in agriculture as a function of taxation. The results emphasize different impacts on farm types, farm sizes, and geographic regions. Crop-producing farms are most affected, and smaller farms are more affected than larger ones. However, they also show substitution effects, such as increased

use of pesticides as fertilizer use declines, and shifting effects to the rest of the world. The model comparisons show that farm models tend to assume greater reductions in fertilizer than market models.

Focus groups discussed several issues, including the link between market and farm models, fertilizer and crop rotation issues, barriers and adaptation strategies for climate change mitigation technologies, the use of carbon taxes to reduce greenhouse gases and nutrient losses, and costs and implementation of policy instruments. Participants emphasized the importance of transparency, differentiated tax rates, and the use of tax revenues.

Model results and focus group discussion Day 2 (S2)

Scenario 2:

Greenhouse Gas Reduction - Analysis of approaches to reduce greenhouse gas emissions in agriculture, such as implementing a tax on greenhouse gas emissions or promoting climate-friendly agricultural production.

Various models from the MIND STEP Model Toolbox were used to analyze the economic impact and potential for reducing GHG emissions through a tax at different levels. The use of the MAGNET macroeconomic model shows that an EU-wide tax in the dairy sector would lead to lower production, higher prices, lower income opportunities, and a reduction in

greenhouse gas emissions. Compared to a global tax scenario, the impact on production and the economy in the EU dairy sector is lower, while the emission reduction is similar. The GLOBIOM model shows that a tax would reduce agricultural GHG emissions in the dairy sector, but would also lead to

a larger decrease in production. The FarmDyn model analyzes the impact of a tax on representative farm groups in the Dutch dairy sector and shows that intensive farms experience a reduction in production and emissions, while more extensive farms would keep production constant and reduce emissions.

In the focus groups, various aspects of greenhouse gas reduction in agriculture were discussed. The importance of farm management practices and farm diversity were emphasized. Costs, structural changes, and the potential of protein crops were discussed. The need for more comprehensive data, consideration of income impacts and unintended consequences was emphasized. Fiscal and voluntary measures were discussed, including the challenges of implementing an emissions tax and linking to social goals. Linking eco-regulations to the Common Agricultural Policy was considered as a funding option, and motivation for collective action was emphasized, including voluntary measures such as agri-environmental programs.

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Building on the modeled results of the MIND STEP toolbox as well as the focus group discussions on the two scenarios of this workshop, it can be summarized that a fertilizer tax and a GHG tax lead to a reduction in nitrogen use and GHG emissions in the agricultural sector both at the sector level and at the farm level. However, differences were found between the results of the farm and market models, in part due to a lack of consideration of price responses in the farm models. The integration of market models in the MIND STEP toolbox also provides insights into Europe-wide effects of such a tax policy. Overall, it became clear in the workshop that a balancing process between economic and environmental impacts as well as between different environmental impacts is essential when introducing such measures. The political and administrative challenges of implementing a fertilizer or greenhouse gas tax, as well as the need to balance these measures with other objectives such as social aspects or food security, were also highlighted. A combination of voluntary measures and taxes could be an appropriate strategy. The results and challenges are useful for further refining the final policy scenarios in MIND STEP and for improving the model tools. Transparency of assumptions and limitations of the models were considered important. In addition, the relevance of the for general research and policy design became clear.