

## **1.3 REPORT ON THE CONCEPTUAL FRAMEWORK OF THE MIND STEP PROJECT**

### **Background**

MINDSTEP's overall goal is to provide evidence to support public decision-making in agricultural, rural, environmental, and climatic policy by producing robust scientific knowledge that considers the behaviour of individual decision-making units (IDM) in agriculture and rural society.

WP1 has contributed to this aim by identifying the future research and policy agenda needs and has explored the viability of potential modelling exercises using the MIND STEP toolbox, which includes models that are currently in use at the farm, regional, national, and international levels, as well as recently proposed IDM models and Agent Based Models (ABM).

D1.3 summarizes the work completed for Task 1.3, which examined the aforementioned MIND STEP models and modelling methodologies with a specific focus on their policy and farm, regional, national, EU, and global driver coverage. This work was carried out to identify whether these models could properly address the benchmark scenarios identified in Task 1.1.

### **Methodological Approach**

The task was completed through the following methods: (i) desk research; (ii) stakeholders' engagements; and (iii) contacts with partners of the MINDSTEP Consortium who are developing/have developed and/or are maintaining the models in the MIND STEP toolkit.

In detail, the 24 scenarios derived from Task 1.1 have been classified in three main groups, each with a particular ambition stemming from one of the 9 post-2020 Common Agricultural Policy (CAP) objectives.

More specifically, the "Climate Change" scenario group has the overall ambition to reduce or prevent the emissions of greenhouse gases (GHG) from primary agricultural production by reducing the sources or enhancing the sinks. On the other hand, the "preserve biodiversity, ecosystem services and environmental care" scenario group aims at accelerating the transition to a sustainable farm system that should have a neutral or positive environmental impact. Finally, the "increase competitiveness" group of scenarios has the goal of modelling changes in CAP payments, supply chain management tools and innovations, and assess their impacts on economic and environmental sustainability.

Finally, the analysis has involved all the seven MIND STEP consortium members in charge of the modelling work (Thuenen, IIASA, INRA, RURALIS, UBO, UCSC, WR, WU), which have been asked which policy scenarios could be already modelled with the models of the MINDSTEP toolbox or which ones could be potentially modelled by providing some modification or improvements to the actual toolbox.

When indicating whether the scenarios proposed by stakeholders could be modelled, partners have been also asked to comment about the specific difficulties in modelling each scenario by identifying the model gaps with respect to the current MINDSTEP modelling toolbox. When available, the partners have also indicated which solutions (if any) could potentially be deployed to fill these gaps. Of course, not all the scenarios could be modelled by all models in the MIND STEP toolbox.

### **Key Outcomes**

According to the partners' indications, all the proposed scenarios in the "climate change" scenario group could be modelled. Similarly, six out of eight scenarios belonging to the "preserve biodiversity,



ecosystem services and environmental care” scenario’s group can be modelled, while the remaining two can be potentially modelled by modifying the current model set-up. On the other hand, the “increase competitiveness” group of scenarios seemed to emerge as the most difficult to model. In fact, only four out of seven scenarios have been deemed modellable, while three out of seven are potentially modellable, as long as the models in the MIND STEP toolbox can be deeply modified.

Task 1.2, which was closely related to this work, examined the models' capacity to generate proper indicators for monitoring and evaluating the effects of the same policies and drivers.

As a result of WP1, a thorough list of important policy issues and associated benchmark scenarios has been produced. These should be modelled along with an indicator framework that includes not only indicators currently used in agricultural policy but also fresh indicators that can be gleaned from models, the ones that have been suggested by stakeholders, or those that have emerged from the systematic literature review.

Finally, the report illustrates how the MINDSTEP toolbox would have modelled the selected policy scenarios. Given the need to develop modelling at various geographic scales, from regional to global, and the wider scope of EU policies related to agriculture to also contribute for example to the Paris climate agreement, the Sustainability Development Goals (SDGs) and the Farm to Fork strategy, the IDM models are in fact linked with current EU-wide and global models. This collection of stand-alone and interlinked models constitutes the MINDSTEP toolbox.

## Implications of results

The analysis of the most relevant policy objectives (task 1.1), of the corresponding indicators (task 1.2) and of the current model gaps (task 1.3), constitutes the “conceptual framework” for the whole MIND STEP project, in the sense that the whole modelling and policy analysis work of the project referred to the identified set of policy questions, indicators and model gaps.

The analysis of WP1 has served as a starting point for WP2's data framework, WP3's, WP4's, and WP5's modelling efforts, as well as WP6's policy evaluation.

The analysis also highlighted that some of the discovered model gaps could be fixed in MINDSTEP in a way that is consistent with the original MIND STEP plan.

