Summary of Deliverable 4.3 - Experimental findings on willingness to participate in agri-environmental schemes.

Agri-environmental schemes (AES) provide benefits to both farms and society, such as water retention and biodiversity conservation. However, these benefits are often indirect and only become apparent over the long term. Effective AES also often require the joint efforts of multiple farms in a region. Thus, the decision to participate in AES is influenced by a variety of factors, including individual attitudes, learning processes, collaboration, and bureaucratic requirements. Modeling AES must therefore also take particular account of behavioral aspects.

Experimental approaches to the study of willingness to participate.

In order to be able to consider these behavioural aspects in the modelling, we use a two-step approach in MIND STEP:

In the first step, CoESM (Collective Ecosystem Services Management) was used. This analysed the decisions of computer agents to contribute to ecosystem services (natural pest control) beyond the farm level by converting part of their cropland into flower strips. In a second step, experiments were conducted with real people using the FarmAgriPoliS participatory agent-based model. The experiments with FarmAgriPoliS were designed to shed light on how the fact that payment depends on the participation of other farms in the region and the framing of the measure (neutral or economically, or ecologically motivated formulations) influence farmers' willingness to participate in collective AES.

CoESM

CoESM was able to provide valuable insights for the development of conservation strategies and policies in the agricultural sector. It showed how farm decisions regarding flower strips affect gross margins, flower strip distribution, and pest risk. While variability in the distribution of flowering strips

| When modelling agri-environmental programs, behavioural aspects in particular must be considered |

is greatest when no farm-to-farm interaction is considered, when interactions are considered, flowering strips are mainly concentrated on low-value crops. Increasing the premium for flowering strips per hectare leads to increased planting of flowering strips, especially in the low-value crops. The model illustrates the importance of collective investment in ecosystem services and can be calibrated to other regions and ecosystem services, for example, examining the impact of different policies and subsidies.

FarmAgriPoliS

FarmAgriPoliS provides participants with a simulated agricultural regio in which they are expected to manage a farm and make decisions about investments, land leasing, and farm exit. In the experiments conducted for the MIND STEP project, participants were also asked to decide whether to participate in collective agri-environmental schemes.

> Payment incentives and communication strategies play an important role in encouraging participation in agri-environmental programs.

Overall, participants had to make an average of 5,56 decisions regarding their participation in agri-environmental measures. The rate of refusal to participate was higher in the constant payment scenarios than in the collective payment scenarios. In particular, participants who received neutral and economically motivated formulations frequently rejected AES under fixed payment. These results highlight the importance of payment incentives and communication strategies in encouraging participation in AEs.

Fazit

The results of the experimental approaches provide a more comprehensive understanding of individual farm decision making and its regional impact, for example, on the distribution of flower strips. These results show that human decision making cannot be explained by the assumptions of rational utility maximization alone and therefore new innovative methods of behavioural modelling should be applied.

For example, the FarmAgriPoliS experiments could be conducted with a larger sample to more accurately quantify the deviations in human decision-making behaviour from a purely utility-maximizing computer-controlled agent. These results could be used to create heuristics that more accurately represent human decision behaviour. In this way, results from participatory ABMs such as FarmAgriPoliS could be used to calibrate behavioural modules in other ABMs and IDMs.