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RESEARCH PROJECT

AGRECO4CAST

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Supporting Agroecological Transitions of Agroforestry Landscapes using an Innovative Transdisciplinary Assessment Framework

Contact our coordinator

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Summary

AGRECO4CAST will co-design a standardized assessment framework for Living Lab (LL) innovations, that fosters a coherent, successful integration of agroecological principles in agroforestry landscapes characterized by perennial cropping systems, such as vineyards, olive- or fruit orchards, across European countries. In addition to the agroecological co-creation approach and the combination of woody-plant components, the novelty lies in the integration of process-based quantitative impact projection with stakeholder-based impact assessments, whereby the integration and stakeholder (SH) dialogue are supported with artificial intelligence (AI) and a digital round table (DRT). Our co-design approach involves SHs at farm and landscape level during all relevant steps of the assessment process, and it combines their inputs with the expertise of process-based modelers, landscape ecologists and planners, social scientists, economists, AI-scientists, etc.. This assessment framework allows for evaluating co-created transition pathways (scenarios).
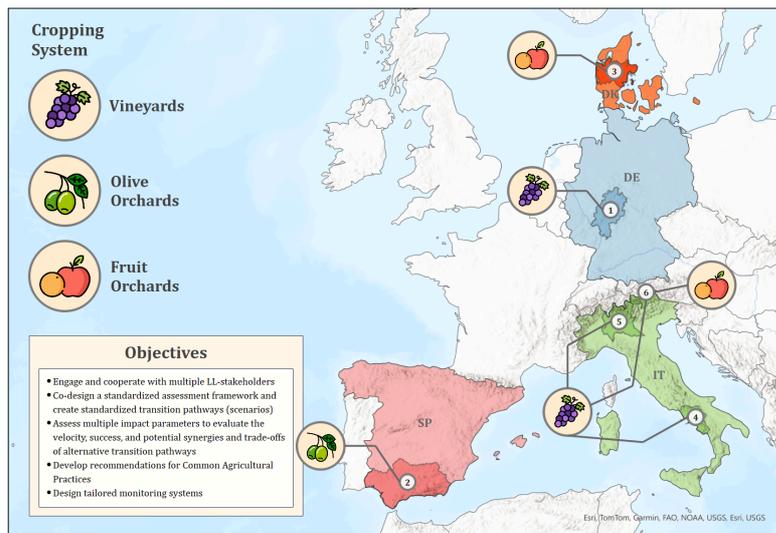
| Sl	Country	Region	Lead-partner	Cropping-system	Conventional practices	Agroecological practices
1	DE	Hesse	HGU/ ZALF	Vineyards	✔	✔
2	SP	Andalucia	CSIC	Olive orchards	✔	✔
3	DK	Midtjylland	ICOEL/ AU	Fruit orchards	✔	✔
4	IT	Campania	MEDES	Vineyards	✔	✔
5	IT	Lombardy	UNIPV	Vineyards	✔	✔
6	IT	South Tyrol	LRC	Vineyards/Fruit orchards	✔	✔

Source: Michael Maerker

We will accompany and evaluate existing experiments and support an efficient redesign of landscape systems following the 5 steps of agroecological transition. We will actively cooperate and engage in dialogue with the EU Agroecology Partnership. To achieve the AGRECO4CAST goals we will:

1. define agroecological measures tailored to local ecological, and socio-economic conditions in 6 LLs;
2. study their effects compared to conventional perennial cropping at the landscape level,

3. assess options for synergies from optimizing spatial configurations of landscape elements across farms and formulate scenarios that account for different climatic and socio-economic future conditions;
4. assess pathways of agroecological transitions; and
5. develop recommendations for Common Agricultural Policy.

Our assessment framework toolbox aims to measure multiple impact parameters to evaluate the velocity, success, potential synergies, and trade-offs of agroecological transition options at landscape level, and to design tailored monitoring systems that support steering the transformation process covering environmental, social, and economic parameters comprehensively. Out of this toolbox, we select case-specific parameters and matching indicators in cooperation with SHs, depending on local needs and preferences. Monitoring and simulating key parameters at both farm and landscape scale support co-development taking into account cross-scale feedbacks and outscaling. The sum of local actions at the farm level allows for novel patterns to emerge at the landscape level, in turn, affecting local processes and decision-making. Currently, process-based modeling, AI-driven analytics, and SH-based impact assessments are mostly used independently, albeit to achieve the same goal for agroecological transition. We aim to support SH-based impact assessments with different modeling approaches to quantitatively project outcomes of codesigned transition pathways covering soil-vegetation feedback affecting water, biodiversity and climate. On the other hand, SH-based assessments complement modeling approaches by tapping into the knowledge and expertise of local stakeholders to assess impacts that are difficult to model, such as farmers' satisfaction or landscape aesthetics. To support communication and involvement of SHs, we develop an AI-Chatbot and a digital round table that supports and emulates the viewpoints of diverse SHs.

Digital toolbox for assessing LL performance: powered by models, socio-economic assessment & AI
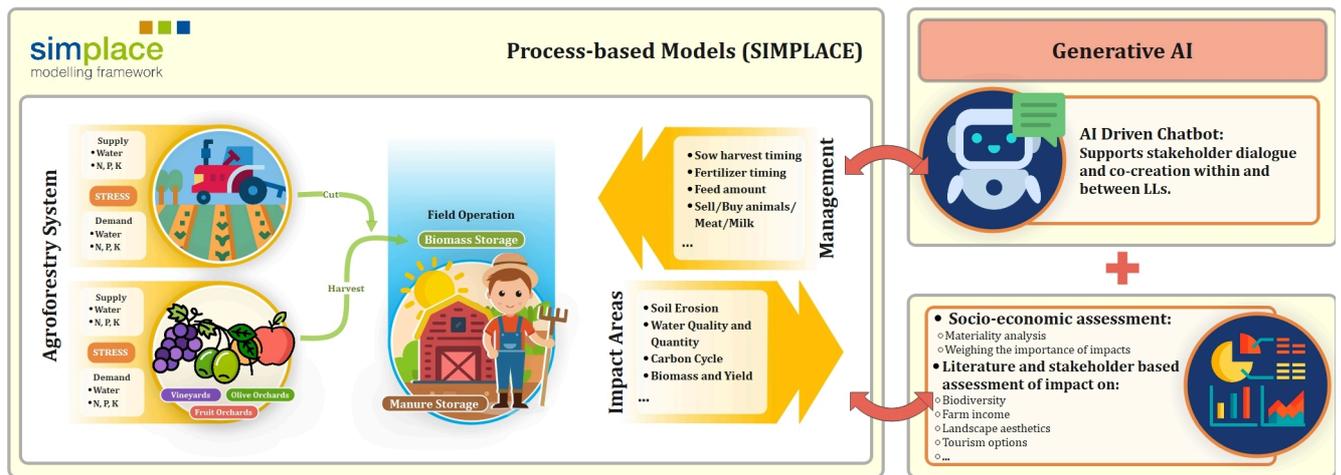
Source: Michael Maerk

Top image: Vineyard. Source: Sven Wilhelm ↗ on Unsplash ↗

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