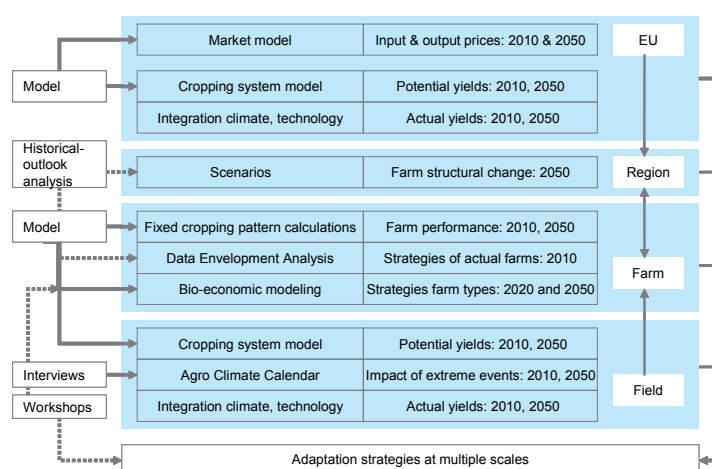


Climate change adaptation in agriculture: multi-scale modelling and stakeholder participation in the Netherlands

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Introduction

Agriculture evolves due to changes in socio-economic, policy, technological and climatic conditions (including extreme events and pests and diseases). Thus, there is a need to identify adaptation strategies that: **1** - apply to these new contexts of farming, **2** - are effective in achieving climate-robust agricultural landscapes, **3** - contribute to social, economic and environmental objectives, and **4** - are meaningful for regional and local stakeholders.



Methodology

- Assess adaptation of agriculture under climatic, socio-economic and technical changes at multiple scales
- Combining crop and farm system models (quantitative) for gradual impact changes and a participatory approach for the impact assessment of extreme events and pests and diseases (semi-quantitative)
- Using EU level productivity and market analysis to provide the macro context for the regional and farm level

This is a first application in the province of Flevoland, the Netherlands. The methodologies have standalone value but are also integrated to define and assess adaptation strategies at multiple levels.

Example results

The Agro Climate Calendar (ACC) for seed potato that was developed to assess extreme weather events

Climate factor	Vulnerable period	Meteorological description	Farm management	Impact on crop	Crop losses (%)
Wet field	Oct – Apr	Period of 21 days of more than 0.5 mm rainfall on 75% of the days	Plowing and preparation of planting bed	Delayed planting date	-
High intensity rainfall	May – Sep	Daily precipitation of at least 45 mm or at least 60 mm in three days	-	Rotting of the tubers	25 – 75
Heat wave	Jul – Aug	Heat wave (at least 3 days with more than 30°C in a period of at least five days above 25°C)	-	Second-growth	25 – 75

Conclusion

The effectiveness of adaptation strategies on economic, environmental and social indicators is explored for different crops, farm types and regions, resulting in a comprehensive assessment of impacts and adaptation strategies to climate change at multiple scales in different scenarios.

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