



Participatory design of farm level adaptation to climate risks in an arable region in the Netherlands

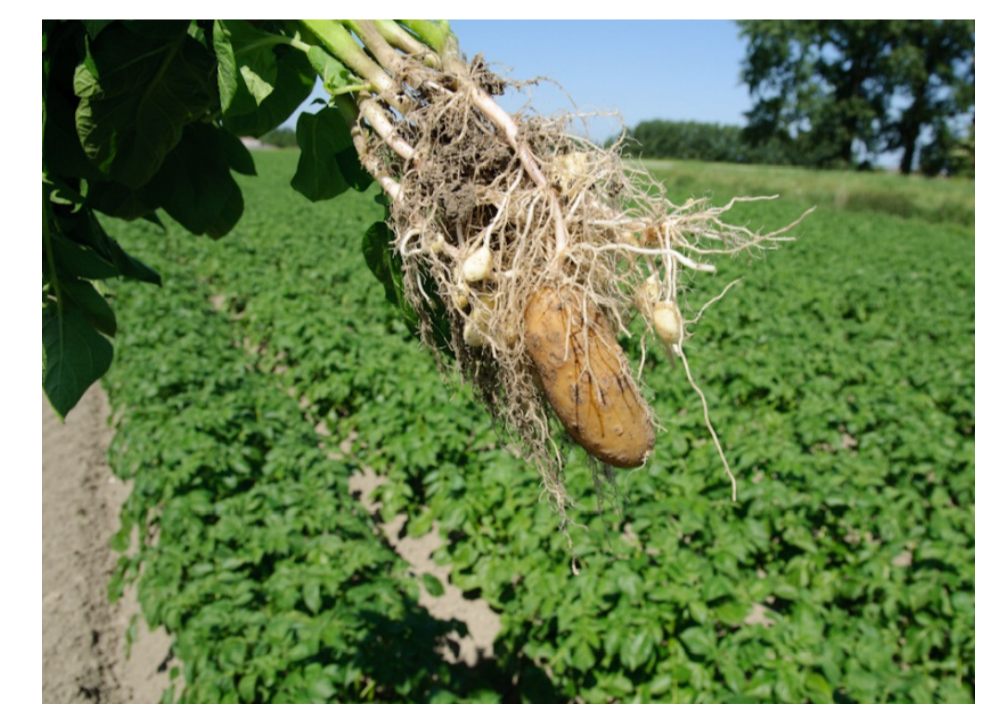
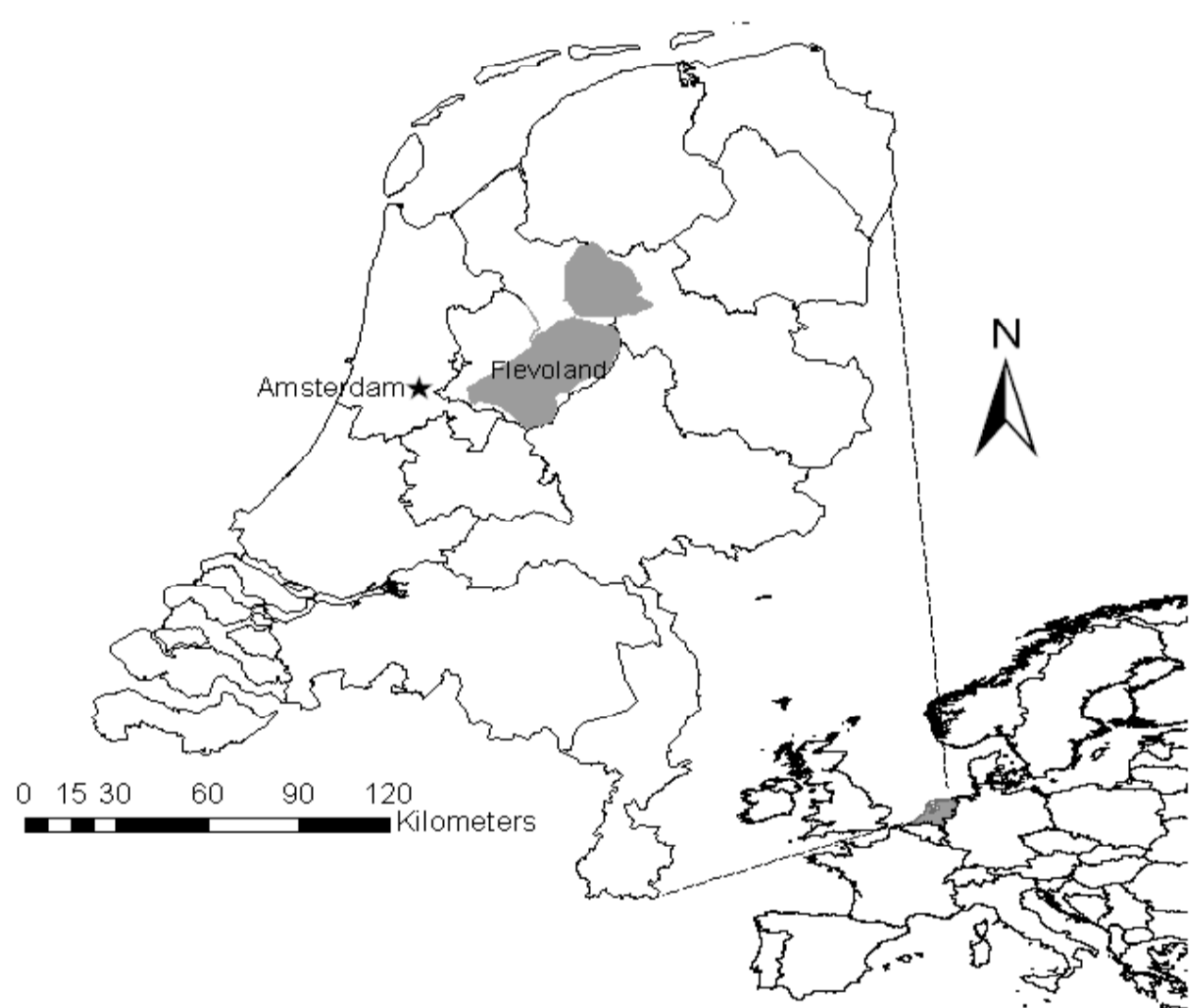
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Introduction

Currently, most of the impact assessments for farming systems rely heavily on (modelling) techniques that cannot take into account extreme events and pests and diseases and cannot address all crops, and are thus not suited as input for a comprehensive adaptation strategy at the farm level.

In this study, crop growth modelling with WOFOST¹ is complemented with the Agro Climatic Calendar (ACC)², a semi-quantitative and participatory approach. This combined approach makes it possible to:

- identify major climate risks and impacts,
- develop an adaptation measure portfolio,
- and design an adaptation strategy.

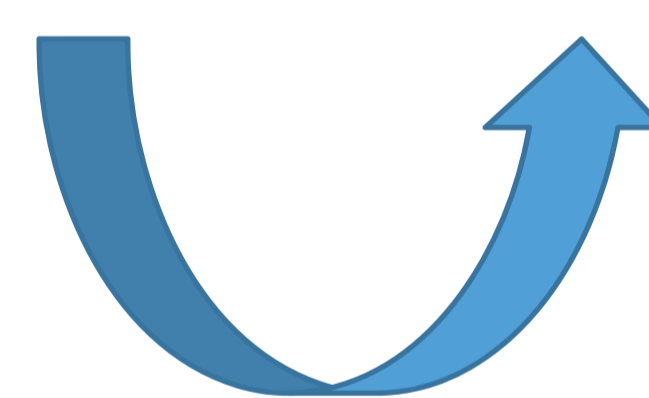


Conclusion

- All crops and all climate risks can be addressed, and all adaptation measures can be explored. Of the 4 major crops potato and seed onion are impacted most.
- Heat waves induce second growth in potato and drip irrigation is a good adaptation measure in most of the scenarios. Warm winters induce early sprouting in potato and air-conditioning is the best adaptation measure.
- Warm and wet conditions induce fungi development in seed onion and chemical treatment is currently the best adaptation option.
- Adaptation strategies can be designed with relatively simple techniques and a good stakeholder process.
- Identified adaptation strategies for contrasting climate and socio-economic scenarios are directly recognizable and relevant for stakeholders.

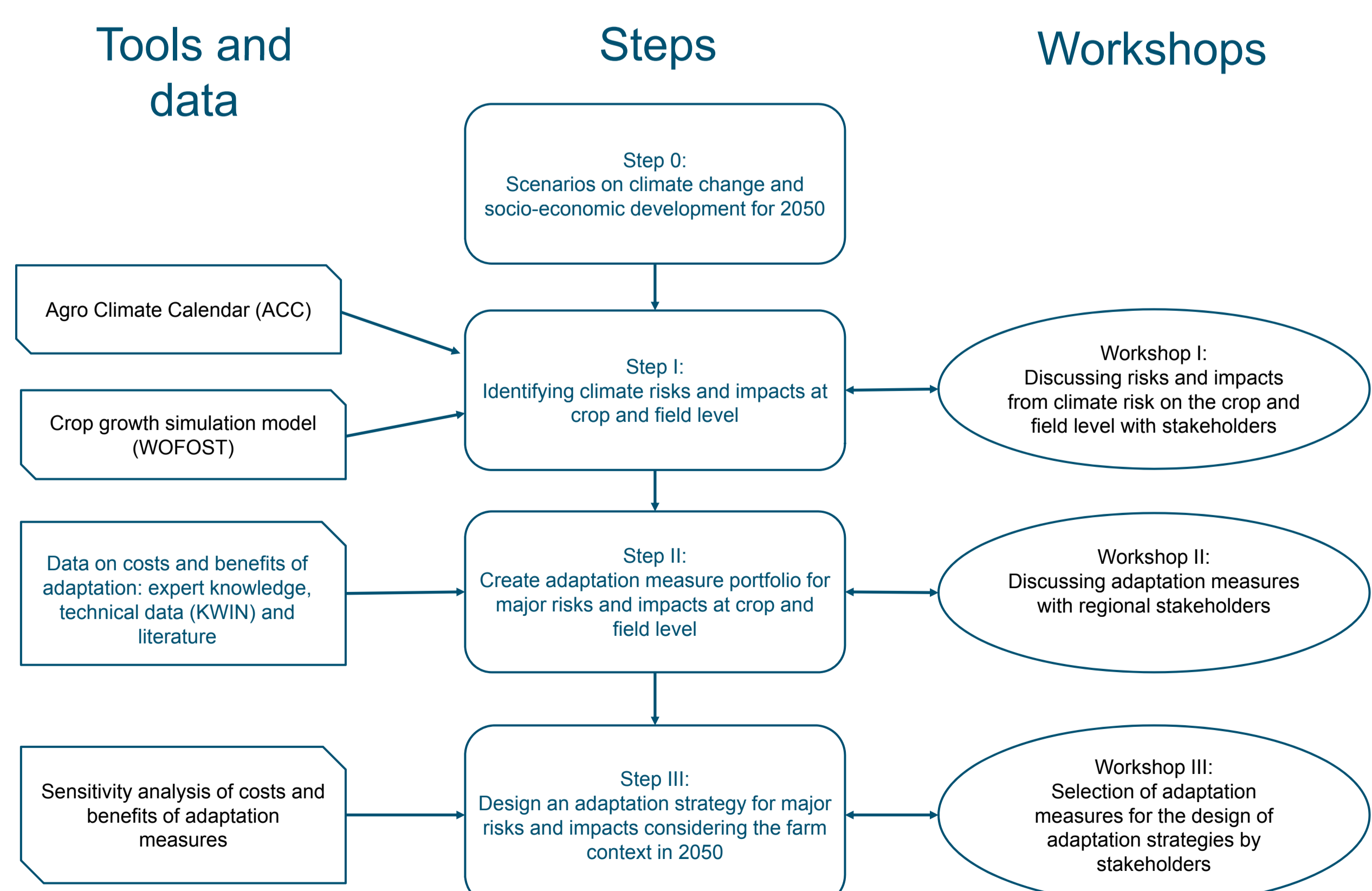
Methods

- We complement crop growth modelling with a semi-quantitative and participatory approach.
- Climate risks and adaptation measures are discussed with stakeholders
- A cost-benefit analysis and stakeholder workshops are used to identify robust adaptation measures for contrasting climate change scenarios for 2050.



Results

For the climate risk heat wave that induces second-growth in potato, drip irrigation was identified as the best adaptation measure in the W+/A1 scenario when impacts are highest and in the G+/B2 scenario for farms that are exposed to high impacts. Crop management or no adaptation performs better in a G+/B2 scenario for farms that are exposed to low impacts than drip irrigation.



Economic impact of adaptation measures against heat waves that cause second growth in potato for contrasting scenarios

