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Abstract title CLIMATE CHANGE IMPACTS AND ADAPTATION OF AGRICULTURE IN THE NETHERLANDS

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Problem definition

Agriculture in the Netherlands evolves due to changes in policy, socio-economic and climatic conditions. Over the past 50 years, the overall number of farms decreased by 75%, while the average farm area increased from 6 to 26 ha. Climate change impact and adaptation assessments have largely focused on current farming systems and technologies, and addressed food production mainly. This is remarkable as is it likely that the dynamics in policies and the speed of technological advances are at least as important. When looking at 2050 not only the climate will have changed but also farming systems, available technologies and various contextual factors will differ from today. While some rural areas will remain production oriented, others will move to a more multifunctional character. For both types of farming there is a need to identify adaptation strategies that are effective in achieving climate-robust agricultural landscapes, contributing to social, economic and environmental objectives.

Theoretical framework and methods

A methodology is developed to assess adaptation of agriculture under climatic and socio-economic changes at multiple scales, with a first application in Flevoland. We use the SEAMLESS – Integrated Framework (www.seamlessassociation.org), which includes a cropping system model, farming system model and a market model. The market model provides the European context in terms of policies and prices, while the cropping system model simulates changes in yields. Both provide inputs to the farming system model, which assesses adoption of adaptation strategies and impacts on social, economic and environmental indicators. The modelling framework is complemented with a more applied and semi-quantitative approach, the Agro-Climatic Calendar (ACC). Based on literature review, expert knowledge and stakeholder participation, critical climate related risks are identified for major current and alternative crops. The frequencies of occurrence of these climate risks are assessed for the current situation (1990) and climate scenarios for 2040. For climate risks with changing frequencies, adaptation strategies are identified. The ACC complements the cropping system model and feeds into the farming system model.

Results and discussion

Scenario projections suggest that there will be more pressure on agriculture from other sectors, implying that the size of farms should further increase or farmers should opt for diversification of their activities. Close to nature areas, the latter should be stimulated in order to obtain cross-sectoral adaptation strategies benefiting the multifunctional landscape.

In the vicinity of the still growing Amsterdam-Almere twin city, rural areas are rapidly changing. Not only because of the urban expansion but also because this new urban setting, a different role of agriculture is required, for instance providing other services like day recreation.

In the larger part of Flevoland, farmers will still be mainly production oriented. The ACC showed that most crops will be able to cope with a change in the frequencies of extreme events and the production of new crops may become feasible. However, current risks are projected to become more severe.

This contribution will present quantitative assessments of adaptation strategies for these different types of farming, also considering the European context.

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