Scenarios of farm structural change for assessing adaptation strategies to climate change: a case study in Flevoland, the Netherlands

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In order to cope with the impacts of climate change, farmers have to develop adaptation strategies. Adaptation strategies to climate change can be implemented at different levels. At the farm level these strategies include adjustments in agro-management within the current farming system, adoption of alternative functions that the agricultural sector can provide to the society, and in the longer term, a shift to another farm type due to structural changes (strategic decisions to change objective, size, intensity and/or specialization). Aggregated changes at farm level may lead to a different farming landscape at regional level.
Climate change is expected to have significant impacts in the longer time run; in 2050 a 1-2° increase in temperature is projected for the Netherlands. Towards 2050, climate change is one of the drivers that will change the farming landscape, but market developments, policy and technological development will be equally important. As a consequence, adaptation to climate change must be considered in the context of these other driving forces that will cause farms of the future to look differently from today's farms. This paper describes an approach to study farm structural changes for assessing adaptation strategies at farm and regional level to climate change in the context of market and policy changes. The aim of the study is to derive images of future farms in a region that can stay viable under different plausible futures. The province of Flevoland in the North of the Netherlands with intensive arable farming as the main type of agricultural activity, has been chosen as a case study.
To account for the heterogeneity of farms and their responses and to indicate possible directions of farm structural change, a farm typology was developed. Trends in past developments in arable farm types were analyzed with data from the Dutch agricultural census. The historical analysis allowed to detect driving forces that contributed to farm structural changes and to evaluate their relative importance. Simultaneously, scenario assumptions about changes in these driving forces elaborated at global and European level, were downscaled for Flevoland, to regional and farm type level in order to project impacts of drivers on farm structural change towards 2050. Scenario assumptions and historical trends were verified and discussed with stakeholders. Together, this resulted in images of future farms in Flevoland, which are likely to stay viable under changing climatic and socio-economic conditions, and for which alternative climate change adaptation strategies can be developed.