A window of opportunities - The contributions of land use modelling to societal learning
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Abstract
It has been argued that the management of land, whether at the field, farm or regional scale, can benefit from computer-based land use system analysis. As a result, a large number of computer-based models and tools have been produced over the past decades with the aim of providing support to policy and management. Though there is still optimism about the potential of land use modelling to contribute to societal problem solving, a number of scholars perceive the impact as too limited. Others, reporting model use outside the scientific sphere, do not explicitly analyze this use for its impact, and the reasons for this impact. Against this background, this thesis investigates the contribution of land use models to learning for societal problem solving, i.e., learning of farm managers and/or land use planners at local, regional, national or international level, to solve a land use related problem. The key question that the study seeks to answer is: How, when, and for what reasons does land use modelling enhance learning in the context of societal problem solving?

What we found were indeed proofs of learning through modelling. The learning took the form of a new perspective on a land use system, frequently in combination with a better understanding of the position of other stakeholders, resulting in adapted problem definitions, a changed solution space and/or the formation of new coalitions to tackle a particular land use related problem. Models were found to contribute not only to improving understanding (heuristic role) but also to agenda-setting (symbolic role) and the creation of communities (relational role). Time and again it appeared not so much ‘critical success factors’ that proved helpful to understand the contribution of modelling to societal change, but rather features of a social context and/or problem solving process in place, such as actors’ aspirations, intentions, and perceptions of their own abilities, social and institutional relations. Consequently, instead of rather static and distinct factors, this thesis work suggests that we need to anticipate the relatively fluid and fuzzy features of social contexts and problem solving processes to harness land use modelling for societal learning.

What do the findings imply for those who wish to pursue the use of science-based land use models to contribute to societal problem solving? First of all, the thesis work demonstrates that the contributions of land use models to societal problem solving represent ‘a window of opportunities’. The contributions are not limited to learning about a land use system but are more diverse and extend to learning about the views, norms and values of other actors, mediation of conflicts between stakeholders and community-building when the organization of stakeholders is desirable for coping with a problem. Furthermore, our research suggests that in designing a modelling strategy, equal attention needs to be paid to the requirements for model development, and the embedding of the work in a given/intended societal context. Depending on the background of the research team, such modelling strategy may encompass: arranging stepping stones, e.g., to let a team member establish and maintain a social network of possible users, or to establish contacts with persons and/or organizations that can become stepping stones. At the more executive level, suitable activities are: an exploration of possible and desired roles (i.e. heuristic, relational, symbolic) of the model in the given and/or intended societal context and to assess appropriate methods to shape participation in model development in line with the envisioned roles.