

## **Regional implementation of the sustainability concept - a methodological challenge: Empirical analyses of land use and sustainable development in Austrian regions within the framework of "institutional analysis" and "integrated modelling"**

Since its access to the EU in the year 1995 Austria is challenged to implement goals of sustainable regional development. A successful implementation of the theoretical concept of sustainability in regions needs the analysis of institutional structures - formal and informal rules - influencing actions of regional actors. In addition, the implementation of the sustainability concept requires methods capable to deliver scientific insights as well as relevant aspects for regional stakeholders. For the present work, two methodical approaches were applied. (1) An Austrian wide analysis of those institutions especially implemented after Austria's access to the EU to foster sustainable regional development was conducted. The analysis addresses issues on the role of these institutions, their financial and personal resources and their integration in the regional network. The results of the study emphasize the difficulties that come up as soon as the concept of sustainable development should be applied for practical issues. (2) The second methodological approach of this work focuses on the development of integrated agent-based models. These models aim at integrating the knowledge of different scientific disciplines in one coherent model. The model enables a better understanding of the interactions of the social, economic and ecological dimension of regional sustainable development. The modelling exercise proves to be an adequate tool to design a transdisciplinary research process between scientists and stakeholders. The model as a joint product of regional actors and scientists allows for a high acceptance of the model. To conclude, my research over the last years shows that the applied methods apt to analyse specific aspects of sustainable regional development. Nevertheless, the development and improvement of methods able to explore direct and indirect interrelations between relevant regional actors, their decisions, land-use change and regional sustainability are indispensable for future research in the field of sustainability.

**Keywords:** agent-based modelling, institutional analysis, participative modelling, rural development, society-nature interaction, sustainable regional development.