

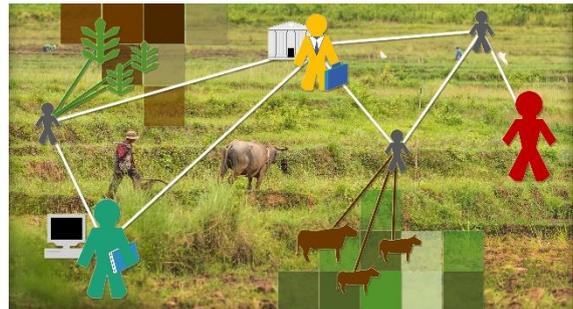
How can computer models better help policymakers to solve problems in human-environment systems?

Meike Will, Gunnar Dressler, David Kreuer, Hans-Hermann Thulke, Adrienne Grêt-Regamey, Birgit Müller

Especially in the present time, we can see how much policymakers rely on models. Many measures to prevent the spread of coronavirus, for example, are based on predictions from computer simulations. Similarly, many decisions in the context of transportation planning are not possible without the use of models. However, when it comes to analysing human behaviour in environmental systems, many scientific models exist, but few of them are used for policy advice.

To understand why the degree to which different models are used to support policy-making varies so much, we conducted interviews with researchers whose models have helped to improve policies. We compared examples that differ in their extent to how explicitly they represent human behaviour as part of the model, ranging from purely environmental systems (including models for river management, honeybee colonies and animal diseases), where modelling techniques have long been established, to coupled human-environment systems (including models for land use, fishery management and sustainable water use). Based on these examples, we synthesised four key factors for successful modelling for policy and management support in systems that incorporate both social and environmental components: (1) the specific requirements caused by modelling the human dimension, (2) the importance of data availability and accessibility, (3)

essential elements of the partnership between modellers and decision-makers, and (4) insights related to characteristics of the decision process. For each of these aspects, we give recommendations specifically to modellers, decision-makers, or both to make the use of models for practice more effective. We argue that if all parties involved in the modelling and decision-making process take into account these suggestions during their collaboration, the full potential that modelling a human-environment system bears can increasingly unfold.



Rice cultivation on the Philippines. Models can help to understand such human-environment systems and support policy-making, for example with regard to sustainable land management. Photo credit: André Künzelmann, Graphic Design: Gunnar Dressler, Icons: NetLogo Shapes Library.

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