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Beliefs, expectations, and assurance in social-ecological system dynamics of common property regimes

Abstract

Game-theoretic reasoning has considerably influenced research on common property regimes. Models of repeated interaction in dilemma situations became dominant narratives to explain cooperation in the commons, and, together with related experiments, explain effects of strategies, communication, reciprocity, trust, reputation, and related institutions.

Models structure and focus thought, but also constrain and narrow perspectives. Several scholars have argued to consider the assurance problem as a model of commons governance. Under certain conditions, also repeated dilemmas become assurance problems. Assurance models are characterized by multiple equilibria, because no dominant strategy exists.

This has substantial implications: Equilibrium outcomes and transition thresholds depend on beliefs about cooperation and expectations about outcomes. Credible futures could thus be important empirical categories to explain the emergence and decline of cooperation. Expectations also crucially depend on the perceived dynamics of resource systems. To explain likely outcomes, empirical models therefore need to account for resource system properties. Ecological and technological system dynamics help to explain social dynamics.

Based on three empirical examples, I will address some consequences of thinking along the lines of this model. The first is a project to construct a village heating network to use thermal energy from biogas combustion. The second is the construction of a large sawmill in Switzerland. The third concerns investments in energy-efficient irrigation in India. In all three cases, expectations play a key role for collective choices.

I will indicate how assurance models could also provide potentially promising avenues for sustainability transformations, with a focus on the water–energy–food nexus in India. This model approach could also inspire interdisciplinary research: Beliefs and expectations may influence, but also be shaped by discourses and institutions. Game-theoretic models could then both inform and account for research on discourses, culture, and institutional crafting along science-policy-society interfaces of commons governance.

Short bio

Christian Kimmich, Ph.D., M.Sc., is researcher at Masaryk University Brno. He works on questions of natural resource governance, including the water–energy–food nexus and related infrastructures, commons, cooperatives, and technologies. His perspectives include social choice and institutions, political economy and game theory, ecological macroeconomics, and related models and methods.

Christian is an agricultural economist and scientist by training and holds a Ph.D. from HU Berlin. He consulted on biofuel conflicts to the German Parliament while at the Leibniz Institute ATB Potsdam. He is fellow of the Future Earth global research platform. As a member of the Sustainable Money Research Group, he studies monetary drivers of growth. He was visiting scholar at the Thurgau Institute of Economics, UC Davis and the Ostrom Workshop at IU Bloomington, and PostDoc at the Swiss Federal Institute WSL of ETH Zürich before joining MU.