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Title: Fostering Sustainability: Design Heuristics for Emergence of Effective Governance in Social-Ecological Systems



Governance has generally been defined (loosely) in terms of a set of rules, decision processes, and actor networks that are set up to steer societies towards some desired outcomes. This definition is based on the premise that governance is something (external) we “do” on a given system in order to make it perform in certain desirable ways. This view also underlies the recent trend towards evidence based policy reform effort, wherein the idea is to isolate the impact of specific policies/institutions, so that those shown to be “effective” can be transferred to other contexts. However, the rather dismal track record of externally driven policy reform efforts – specifically in the context of natural resource governance in the developing world - behooves us to step back and critically re-examine how we conceptualize governance of social-ecological systems (SESs). In this paper we propose departing from the dominant mindset of viewing governance as something “external” that we “do” to a system. Instead, we propose thinking of governance as an emergent phenomenon. Emergence is generally associated with dynamic systems whose behavior arises from the interaction among its parts, often leading to unique synergistic effects, which lead the whole to do much more and/or something qualitatively different than the constituent parts. In order to study this phenomena of emergence we developed a typology of small-scale irrigation systems, based on case studies from Asia. Our analysis reveals a wide range of institutional arrangements based on –reciprocity, bureaucracy, religion and market –which emerge as “best fits” to specific types of underlying social-ecological contexts. Through exploring these varied types of configurations we show how successful governance may be the result of a constellation of both biophysical and social factors that induce social interactions and shared understandings, thus enabling governance to develop through a self-organizing, emergent process from within. We provide several examples to show how disregarding this process of emergence may explain the failure of several well-intended policy reform efforts and suggest some SES design heuristics as a way forward.