Sustainability Science

Transdisciplinary research for systemic change: who to learn with, what to learn about and how to learn

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Abstract
A key aim of transdisciplinary research is for actors from science, policy and practice to co-evolve their understanding of a social–ecological issue, reconcile their diverse perspectives and co-produce appropriate knowledge to serve a common purpose. With its concurrent grounding in practice and science, transdisciplinary research represents a significant departure from conventional research. We focus on mutual learning within transdisciplinary research and highlight three aspects that could guide other researchers in designing and facilitating such learning. These are: "who to learn with", "what to learn about" and "how to learn". For each of these questions, we present learning heuristics that are supported by a comparative analysis of two case studies that addressed contemporary conservation issues in South Africa but varied in scale and duration. These were a five-year national-scale project focusing on the prioritisation of freshwater ecosystems for conservation and a three-year local-scale project that used ecological infrastructure as a theme for advancing sustainability dialogues. Regarding the proposed learning heuristics, "who to learn with" is scale dependent and needs to be informed by relevant disciplines and policy sectors with the aim of establishing a knowledge network representing empirical, pragmatic, normative and purposive functions. This emergent network should be enriched by involving relevant experts, novices and bridging agents, where possible. It is important for such networks to learn about the respective histories, system processes and drivers, values and knowledge that exist in the social–ecological system of interest. Moreover, learning together about key concepts and issues can help to develop a shared vocabulary, which in turn can contribute to a shared understanding, a common vision and an agreed way of responding to it. New ways of group learning can be promoted and enhanced by co-developing outputs (boundary objects) for application across knowledge domains and creating spaces (third places) that facilitate exchange of knowledge and knowledge co-production. We conclude with five generic lessons for transdisciplinary researchers to enhance project success: (a) the duration, timing and continuation potential of a project influences its prospects for achieving systemic and sustainable change; (b) bridging agents, especially if embedded within an implementing agency, play a critical role in facilitating transdisciplinary learning with enhanced outcomes; (c) researchers need to participate as co-learners rather than masters of knowledge domains; (d) purposeful mixed-paradigm research designs could help to mend knowledge fragmentation within science; and (e) researchers must be vigilant for three pitfalls in mutual learning initiatives, namely biases in participant self-selection, perceived superiority of scientific knowledge and the attraction of simple solutions to wicked problems that retain the status quo.