Recognising social-ecological feedbacks: Co-creating a learning history of the dynamics of social-ecological innovations

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Abstract

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A key challenge for resilience thinking is to unravel and explain the dynamics of how innovative social responses to ecosystem change contribute to a social-ecological system’s resilience. The concept of social-ecological innovation offers a theoretical means to extend our understanding of how profound and novel social change can transform away from trajectories that threaten the resilience of a social-ecological system. Recent research into social-ecological innovations focuses on the challenges of linking local transformational change to broader system change through appropriate global governance structures. We address the need for a complementary stream of research that focuses on the temporal and spatial scales of the social-ecological feedback loops which characterise and determine how a social-ecological innovation contributes to a system’s resilience. By focusing on innovation at the individual and community level we are able to contribute to a more holistic understanding of how transformational change can be achieved across and between multiple scales and levels of a social-ecological system.

We present findings from research performed alongside Transition Ladock and Grampound Road, a community initiative situated in Cornwall, UK. Acting in response to perceived resource, climate and ecosystem change, the community has implemented a number of social-ecological innovations including renewable energy initiatives, a community nut orchard and local food market. The community aspires to build resilience and develop a learning process that can be diffused across spatial scales. We question whether individuals and groups involved in the social-ecological innovations of Low Carbon Ladock and Grampound Road are able to influence or control change across the temporal and spatial scales of a social-ecological system. Thus, a central question concerns agency. We explore whether and how individuals and groups recognise, understand and control the dynamic feedback loops that are an inherent and defining aspect of social-ecological innovation.

Using participatory action research methodology, we introduce a research framework that empowers communities to understand the processes of learning and feedback loops during social-ecological innovations. Innovation histories, an extension of the learning histories approach, use participatory co-production of innovation timelines, social network maps and reflective interviews to develop the community’s understanding of the temporal and spatial

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scales and dynamics of the social-ecological innovation. Nested within the approach, we use mental models, a psychological research method used widely across disciplines, to elicit participants’ internal cognitive representations of the external cause-effect relationships that characterise social-ecological feedbacks. Situated transect walks are combined with semi-structured interviews to allow participants to co-produce a construct of their individual mental model. We provide a forum for participants to understand, share and develop a learning history of their individual and shared mental models. By sensitising participants to feedbacks, our research becomes part of a collaborative process of change for current and future resilience building.

**Keywords:** Social ecological systems, Resilience, Feedback, Participation, Shared learning, Innovation