



Co-designing research on transgressive learning in times of climate change

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This paper reflects on the epistemological context for the co-design of a research programme on transformative, transgressive learning emerging at the nexus of climate change, water and food security, energy and social justice. It outlines a sequence of learning actions that we, as a group of collaborating partners in a Transformative Knowledge Network (TKN) undertook to co-design a research programme, firstly *in situ* in various case study contexts, and secondly together across case study contexts. Finally, it provides some reflections and learning points.

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A focus on transformative, transgressive learning in times of climate change

The need for radical social learning-centred transformation in times of climate change is recognized in the social-ecological sciences (SES) [1,2,3**]. Yet how this occurs *via* learning processes remains a key under-researched narrative, especially where ‘wicked problems’ arise at the nexus of food-water-energy-climate-social justice

[3**,4,5**,6**,7]. Nexus issues involve interlinked and intersectional concerns that often involve complexity and trade offs [8]. Engaging with such concerns requires learning, dialogue, collaboration and coordination [8,3**], crossing institutional and social boundaries, expanding horizons, transgressing stubborn routines, norms and hegemonic powers [2]. Ultimately new forms of human activity and new social systems need to be created that are more sustainable and socially just. Latour [10] calls this an open-ended ‘learning curve’ involving multiple relations and perspectives (both human and non-human).

Research undertaken by transition theorists suggests that transformation to sustainability occurs in ‘niches’ at the local level, where nexus concerns arise. It is from this level that wider social changes and regime shift transformations are driven or emerge [11,12]. Radical innovations in niches involve, ‘dedicated actors [who] nurture alignment and development on multiple dimensions to create “configurations that work”’ [11, p. 495]. This involves negotiation and *learning with others* how to bring about such transformations [11,12,13,14,15,16**]. While this is recognized, there is still a lack of clarity on *the types and processes of learning* that drive such ‘radical innovations’ at niche level. There is thus a need for explaining *this type of learning, how such learning occurs, and what influences this learning*.

Confirming the significance of engaging with transformative learning and praxis at the niche level, the IPCC [2] notes that local institutions are important for social engagement in climate change responses and dialogical, participatory and deliberative democracy approaches [17,18,19,20] are seen as helpful in bringing diverse groups of people and institutions together to realize transformative sustainability practices. While there is recognition of the importance of participatory and deliberative approaches for learning and societal change [11,12,13,14,15,16**], the IPCC [2] suggests that the outcomes of such processes are ‘mixed’ and require further research.

There also appears to be poor differentiation between transformative and transgressive forms of learning and a lack of insight into the potential significance of this differentiation for sustainability transitions. Here