

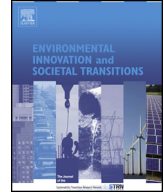


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Contents lists available at ScienceDirect

Environmental Innovation and Societal Transitions

journal homepage: www.elsevier.com/locate/eist



Human geography and socio-technical transition studies: Promising intersections



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ARTICLE INFO

Article history:

Available online 1 April 2015

Keywords:

Socio-spatial context
Legitimization
Trust building
Transition politics
Place-making

ABSTRACT

Transition researchers recognize increasingly the need to better address the role that spatial and geographical factors play in guiding the evolution of socio-technical and technological innovation systems. At the same time, some geographers are being drawn to transition studies as they strive to better understand the development trajectories of cities, industries, production networks, and economies. Building off these convergences, this paper proposes two interventions through which geographical ideas might further contribute to transitions research. The first focuses on conceptualizations of the socio-spatial dynamics through which TIS or niche contexts are coupled or aligned effectively with socio-technical regimes such that regime shifts become possible. The second brings the concept of place-making to bear on transition studies in order to analyze the political processes that shape the evolution of socio-technical systems. The paper closes with general arguments about ways to expand and diversify the geography-of-sustainability-transitions epistemic community.

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1. Introduction

Over the past decade or so, socio-technical transition theory has become an influential body of work that strives to understand the co-evolution of societies and technological systems, particularly those

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associated with essential sectors such as water and sanitation, energy, transportation, and agriculture (e.g., Geels, 2002, 2005; Kemp et al., 2007; Klerkx et al., 2010; Dewald and Truffer, 2012). Sustainability and sustainable development are key themes in the literature, manifest in transitions toward less environmentally destructive socio-technical systems (Markard et al., 2012). The field is constituted by a diversity of approaches, those that emphasize the significance of innovative niches in driving the evolution of socio-technical systems (e.g., Kemp et al., 1998), those that focus on the management of transitions (e.g., Voss et al., 2009), and those concerned with the internal and external forces that drive a socio-technical system's evolution (e.g., Geels, 2004; Geels and Schot, 2007; Markard and Truffer, 2008; Shove, 2004). In recent years transition theory has engaged with the work of geographers as scholars strive to better account for the role that multi-scalar, spatial, and context-specific factors play in shaping the pace, scope, and direction of transitions (Coenen et al., 2012; Raven et al., 2012; Binz et al., 2014). This "turn" has also attracted geographers to transition concepts and approaches which are beginning to diffuse more widely in fields such as economic geography, urban geography, and political ecology (Truffer, 2008; Bulkeley and Castán Broto, 2012; Truffer and Coenen, 2012; Lawhon and Murphy, 2012).

Building off these foundations, this paper seeks to advance further this dialogue through two interventions that demonstrate how geographical concepts and perspectives can contribute significantly to transition studies. The first relates to the question of how we conceptualize and analyze the socio-spatial relationships constituting the alignments or couplings between the functional contexts of technological innovation systems (TIS), socio-technical niches (or niche experiments), and the socio-technical regimes where transition is desired. Drawing off of institutional and relational ideas from economic geography, the paper develops a conceptual framework for analyzing the socio-spatial processes through which couplings (and non-couplings) emerge between niche, TIS, and regime and landscape contexts such that transitions (disruptive or otherwise) might occur. Once the framework is described, its utility is then demonstrated through a case study of rural energy transitions in East Africa.

The paper's second intervention focuses on the power relations and politics that underpin transition processes and the contributions that geographers can make to our understandings of these dynamics. Through the application of recent work on place-based political struggles from urban and political geography (Pierce et al., 2011), the paper argues that the political dynamics of transition can be understood as a form of relational place-framing and making – a multi-scalar, networked political process through which the proponents of competing visions for the future of a region, community, or country struggle for control over the direction, pace, and scope of its development. Through these relational (networked) political struggles one group's place frame (e.g., vision or imaginary) may become or remain dominant or, more likely, a compromise or hybridized outcome may result, one which is necessary to achieve political consensus but which may dilute the prospects for more radical or alternative transitions toward sustainability. To demonstrate its value for transitions studies, the conceptual approach is deployed through a case study of smart growth initiatives in the Boston (USA) Metropolitan region.

Beyond these specific interventions, the paper concludes with general arguments regarding the potential for a substantive and sustained dialogue between geographers and transition scholars. Challenges in this respect relate to the "wheres" of transitions research and the "whos" or participants involved in the geography-of-sustainability-transitions project. Researchers would do well to shift some of its empirical focus away from the European, North American, and Australian context and to expand and extend this conversation to include a greater number and diversity of colleagues from geography. Challenges aside, a constructive dialogue between geographers and transitions researchers is well underway and it will continue to yield important insights regarding the spatial dimensions and dynamics of socio-technical change.

2. Geographies of sustainability transitions: progress to date

Thus far, socio-technical transition theory's engagement with geography has been significant in raising questions about the ways in which space, scale, and territory are accounted for in the transitions literature and by encouraging geographers to engage with transitions scholarship (see Coenen

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