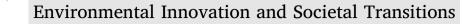
Contents lists available at ScienceDirect



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



Geographies of transition—From topical concerns to theoretical engagement: A commentary on the transitions research agenda



Christian Binz^{a,b,*}, Lars Coenen^{c,d}, James T. Murphy^e, Bernhard Truffer^{a,f}

^a Eawag: Swiss Federal Institute of Aquatic Science and Technology, Duebendorf, Switzerland

^b CIRCLE - Centre for Innovation, Research and Competence in the Learning Economy, Lund University, Sweden

^c Melbourne Sustainable Society Institute, Faculty of Architecture, Building & Planning, University of Melbourne, Parkville, VIC 3010, Australia

^d Mohn Centre for Innovation and Regional Development, Western Norway University of Applied Sciences, Postboks 7030, NO-5020 Bergen, Norway

^e Graduate School of Geography, Clark University, USA

^f Faculty of Geosciences, Utrecht University, Utrecht, the Netherlands

ARTICLE INFO

Viewpoint

Keywords: Sustainability transitions Geography Geography of transitions Scale Space Place

ABSTRACT

This viewpoint takes stock with the 'geography of sustainability transitions' (GOST) as it is presented in the transitions research agenda. GOST has been a relatively recent addition to transition theorizing, addressing the need for greater sensitivity and attention to the scales, spatialities, and context-specific factors that shape transitions. In our view, the agenda represents a rather narrow perspective on GOST, which is geared to two empirical themes, namely urban transitions and transitions in developing countries. While these are relevant and topical issues, the section lacks sufficient acknowledgement of the increasing engagement of geographers with transitions studies and the theoretical approaches they have brought to bear on the field. This short commentary thus aims at complementing the agenda paper by outlining a theoretical research agenda that is emerging in this field, framed around the conceptualization of scales, places and spaces in which transitions unfold.

1. Introduction

The updated research agenda of the Sustainability Transitions Research Network (STRN) provides testimony to the thriving state of transitions research (Köhler et al., 2019). In view of the reported successes and considering the quickly expanding theoretical legacy of the field, it is not surprising that the STRN agenda is structured around its 'foundational' concepts (e.g. MLP, SNM, TM, TIS). This caters to conceptual coherence and consistency but may also increase the risk for theoretical lock-in in the long term. This viewpoint takes the section on the 'geography of sustainability transitions' (GOST) as a case in point for outlining how field-internal agenda setting should go hand-in-hand with deepened theoretical engagement with related social science disciplines.

The 'geography of sustainability transitions' has been a relatively recent addition to transition theorizing, addressing the need for greater sensitivity and attention to the scales, spatialities, and context-specific factors that shape transitions. The agenda paper frames the 'geography of transitions' as being "primarily concerned with understanding how and why transitions are similar or different across locations" (Köhler et al., 2019: 14). Despite the conceptual subtitle 'spaces, scales and places', most of the subsequent discussion focuses on empirical insights regarding the geographical unevenness and spatial variegation of transition trajectories and their impacts.

https://doi.org/10.1016/j.eist.2019.11.002

Received 25 August 2019; Received in revised form 16 October 2019; Accepted 4 November 2019 Available online 05 December 2019 2210-4224/ © 2019 Elsevier B.V. All rights reserved.

^{*} Corresponding author at: Eawag: Swiss Federal Institute of Aquatic Science and Technology, Duebendorf, Switzerland. *E-mail address:* christian.binz@eawag.ch (C. Binz).

As a result, the agenda represents a rather narrow perspective on the GOST, which is geared to two empirical themes, namely urban transitions and transitions in developing countries. While these are relevant and topical issues, the section lacks sufficient acknowledgement of the increasing engagement of geographers with transitions studies and the theoretical approaches they have brought to bear on the field. This short commentary thus aims at complementing the STRN agenda by outlining the contours of a wider theoretical research agenda that is emerging in this field, framed around the conceptualization of scales, places and spaces in which transitions unfold (Coenen et al., 2012; Hansen and Coenen, 2015; Murphy, 2015).

2. Scale

The agenda paper reflects a general tendency in transition studies to implicitly suppose that transition processes play out (and can be analysed) within the boundaries of pre-given, and often formal, geographical categories such as 'cities', 'regions', 'nations' or 'the global South.' Such an approach is problematic in that it fails to consider the fluidity, permeability, and multi-scalarity of such territorial containers. Moreover, this view is at odds with recent insights in the field itself, which highlight the importance of horizontal and vertical interdependencies between cities, regions, countries and supranational structures in transition processes (Bauer and Fuenfschilling, 2019; Hansen et al., 2018; Quitzow, 2015; Sengers and Raven, 2015). It also contradicts state of the art theorizing in human geography, where multi-scalar, relational, and constructivist understandings of scale and socioeconomic processes predominate (Coenen et al., 2012; MacKinnon, 2011; Marston, 2000).

Transition studies accordingly need to develop concepts and methods that better account for the manifold ways in which apparently territory-specific processes are influenced by 'distanciated' policy interventions, narratives, firms, or institutional arrangements. Recent contributions have ventured in this direction predominantly by exploring multi-scalar relations at a niche level, e.g. through the perspectives of transnational linkages in niche experiments (Wieczorek et al., 2015), global innovation systems (Binz and Truffer, 2017), or policy mobilities (Sengers and Raven, 2015).

Regime-level processes, in turn, have only very recently been conceptualized from a multi-scalar perspective (Bauer and Fuenfschilling, 2019; Fuenfschilling and Binz, 2018; Späth and Rohracher, 2012) and we still lack a thorough understanding of how 'landscape' forces are influenced by and influencing developments at interrelated spatial scales (Schot and Kanger, 2018). Taking multi-scalarity seriously means deeply reconceptualizing some of the foundational concepts and acknowledging the role that distanciated forces play in shaping niche, regime and landscape dynamics or the development of TIS structures and SNM processes in specific places. Economic geography, international political economy and globalization studies all offer promising avenues for improving our theorizing in this respect (Amin and Cohendet, 2004; Fuenfschilling and Binz, 2018; Newell, 2019).

3. Place

Second, the agenda provides a static understanding of place that ignores the richness of place-making theories in geography. These theories argue that places are produced relationally – meaning they are not pre-ordained, discrete sites or locations, but contexts actively constituted by the relations between actors, materials, cultures, histories, and structures (Pierce et al., 2011). These place-making relations come together collectively in place frames – shared understandings of what a place is, means, and might become through socio-political change or sociotechnical transitions (McCauley and Murphy, 2013). Such frames are powerful with respect to potential transition trajectories given they can be mobilized in support of (or against) niche innovations or regime changes, and because they reflect wider landscape features such as societal values, national or global trends, and/or cultural shifts (Jensen et al., 2016; Murphy, 2015; Truffer et al., 2015).

A proper engagement with place-based transitions would have to recognize the 'urban' or 'regional' as holistic categories with emergent properties that warrant further conceptualization (Bulkeley et al., 2010; Frantzeskaki et al., 2017; Wolfram and Frantzeskaki, 2016). Such a reconceptualization would also help to advance transitions research beyond a focus on singular socio-technical systems. Instead, place-making inspired theorizing would explore how transitions are influenced by various regimes at once, all related to the multiplicity of infrastructure, consumption, and production activities that constitute places (Hodson et al., 2017; Konrad et al., 2008; Murphy and Carmody, 2019).

4. Space

Third, geography provides highly relevant theoretical inroads to explore the spaces and spatiality of transition processes. Here, the agenda paper rightly points to a need to further explore and explain the spatial variation in transition's social, economic and ecological impacts. We also fully agree that the euro-centric, linear spatial diffusion models that underlie many MLP-based studies should be replaced with more variegated models of transition pathways that explicitly include and account for innovation processes in non-Western countries and developing/emerging economies (Hansen et al., 2018; Van Welie et al., 2018).

An additional area where conceptual cross-fertilization is well underway concerns the question under which conditions cities, regions or countries are able to branch into radically new (potentially more sustainable) development trajectories. Evolutionary economic geography (EEG), in particular, affords a sophisticated understanding of the ways in which the spatially uneven distribution of skills, technological capabilities and institutional capacities influence innovation and structural transformation potentials (Boschma et al., 2017; Boschma, 2017; Neffke et al., 2011). EEG provides robust evidence that regions and countries are most likely to move into new industries that are related to the pre-existing knowledge bases and capability portfolios (Hidalgo et al., 2018). Exploring the determinants of 'long jumps' into technologically and institutionally unrelated, more sustainable, development paths is

a frontier that is of key relevance for both transitions and geography scholars (Binz and Diaz Anadon, 2018; Boschma, 2017; Grillitsch et al., 2018).

5. Outlook

This short discussion illustrates that an exciting theoretical agenda is emerging around the multi-scalar, place-based and spatial factors and processes that influence transition dynamics. Yet, to better understand and explain the geography of sustainability transitions, we need to combine the topical concerns mentioned in the agenda paper with a more serious engagement with current theorizing in human geography and related spatial theories in the social sciences. If successful, the GOST could develop into a research avenue, which is of crucial importance for understanding and supporting sustainability transitions in today's digitalizing, urbanizing, and increasingly unequal world system.

Acknowledgements

Lars Coenen gratefully acknowledges financial support from the City of Melbourne and the Department of Jobs, Precincts and Regions, State of Victoria, Australia.

References

Amin, A., Cohendet, P., 2004. Architectures of Knowledge: Firms, Capabilities, and Communities. OUP Oxford.

- Bauer, F., Fuenfschilling, L., 2019. Local initiatives and global regimes—multi-scalar transition dynamics in the chemical industry. J. Clean. Prod. 216, 172–183. Binz, C., Diaz Anadon, L., 2018. Unrelated diversification in latecomer contexts—the emergence of the Chinese solar photovoltaics industry. Environ. Innov. Soc. Transit. 28, 14–34.
- Binz, C., Truffer, B., 2017. Global Innovation Systems—a conceptual framework for innovation dynamics in transnational contexts. Res. Policy 64 (7), 1284–1298. Boschma, R., 2017. Relatedness as driver of regional diversification: a research agenda. Reg. Stud. 51 (3), 351–364.
- Boschma, R., Coenen, L., Frenken, K., Truffer, B., 2017. Towards a theory of regional diversification. Reg. Stud. 51 (1), 31-45.

Bulkeley, H., Broto, V.C., Hodson, M., Marvin, S., 2010. Cities and Low Carbon Transitions. Routledge.

- Coenen, L., Benneworth, P., Truffer, B., 2012. Toward a spatial perspective on sustainability transitions. Res. Policy 41 (6), 968-979.
- Frantzeskaki, N., Coenen, L., Castán Broto, V., Loorbach, D. (Eds.), 2017. Urban Sustainability Transitions. Routledge, New York, NY.
- Fuenfschilling, L., Binz, C., 2018. Global socio-technical regimes. Res. Policy 47 (4), 735-749.
- Grillitsch, M., Asheim, B., Trippl, M., 2018. Unrelated knowledge combinations: unexplored potential for regional industrial path development. Cambridge J. Reg. Econ. Soc. 11 (2), 257–274.
- Hansen, T., Coenen, L., 2015. The geography of sustainability transitions: review, synthesis and reflections on an emergent research field. Environ. Innov. Soc. Transit. 17, 92–109.
- Hansen, U.E., Nygaard, I., Romijn, H., Wieczorek, A., Kamp, L.M., Klerkx, L., 2018. Sustainability transitions in developing countries: stocktaking, new contributions and a research agenda. Environ. Sci. Policy 84, 198–203.
- Hidalgo, C.A., Balland, P., Boschma, R., Delgado, M., Feldman, M., Frenken, K., Glaeser, E., He, C., Kogler, D.F., Morrison, A., 2018. The principle of relatedness. International Conference on Complex Systems 451–457.

Hodson, M., Geels, F., McMeekin, A., 2017. Reconfiguring urban sustainability transitions, analysing multiplicity. Sustainability 9 (2), 299.

Jensen, J.S., Fratini, C.F., Cashmore, M.A., 2016. Socio-technical systems as place-specific matters of concern: the role of urban governance in the transition of the wastewater system in Denmark. J. Environ. Policy Plan. 18 (2), 234–252.

- Köhler, J., Geels, F.W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., 2019. An agenda for sustainability transitions research: state of the art and future directions. Environ. Innov. Soc. Transit. 31, 1–32.
- Konrad, K., Truffer, B., Voß, J., 2008. Multi-regime dynamics in the analysis of sectoral transformation potentials: evidence from german utility sectors. J. Clean. Prod. 16, 1190–1202.
- MacKinnon, D., 2011. Reconstructing scale: towards a new scalar politics. Prog. Hum. Geogr. 35 (1), 21-36.
- Marston, S.A., 2000. The social construction of scale. Prog. Hum. Geogr. 24 (2), 219-242.
- McCauley, S.M., Murphy, J.T., 2013. Smart growth and the scalar politics of land management in the Greater Boston region, USA. Environ. Plan. A 45 (12), 2852–2867.
- Murphy, J.T., Carmody, P.R., 2019. Generative urbanization in Africa? A sociotechnical systems view of Tanzania's urban transition. Urban Geogr. 40 (1), 128–157. Murphy, J.T., 2015. Human geography and socio-technical transition studies: promising intersections. Environ. Innov. Soc. Transit. 17, 73–91.
- Neffke, F., Henning, M., Boschma, R., 2011. How do regions diversify over time? Industry relatedness and the development of new growth paths in regions. Econ. Geogr. 87 (3), 237–265.
- Newell, P., 2019. Trasformismo or transformation? The global political economy of energy transitions. Rev. Int. Polit. Econ. 26 (1), 25-48.
- Pierce, J., Martin, D.G., Murphy, J.T., 2011. Relational place-making: the networked politics of place. Trans. Inst. Br. Geogr. 36 (1), 54-70.
- Quitzow, R., 2015. Dynamics of a policy-driven market: the co-evolution of technological innovation systems for solar photovoltaics in China and Germany. Environ. Innov. Soc. Transit. 17, 126–148.

Schot, J., Kanger, L., 2018. Deep transitions: emergence, acceleration, stabilization and directionality. Res. Policy 47 (6), 1045–1059.

- Sengers, F., Raven, R., 2015. Toward a spatial perspective on niche development: the case of Bus Rapid Transit. Environ. Innov. Soc. Transit. 17, 166–182. Späth, P., Rohracher, H., 2012. Local demonstrations for global transitions-dynamics across governance levels fostering socio-technical regime change towards sustainability. Eur. Plan. Stud. 20 (3), 461–479.
- Truffer, B., Murphy, J.T., Raven, R., 2015. The geography of sustainability transitions: contours of an emerging theme. Environ. Innov. Soc. Transit. 17, 63–72.
- Van Welie, M.J., Cherunya, P.C., Truffer, B., Murphy, J.T., 2018. Analysing transition pathways in developing cities: the case of Nairobi's splintered sanitation regime. Technol. Forecast. Soc. Change 137, 259–271.
- Wieczorek, A.J., Raven, R., Berkhout, F., 2015. Transnational linkages in sustainability experiments: a typology and the case of solar photovoltaic energy in India. Environ. Innov. Soc. Transit. 17, 149–165.
- Wolfram, M., Frantzeskaki, N., 2016. Cities and systemic change for sustainability: prevailing epistemologies and an emerging research agenda. Sustainability 8 (2), 144.