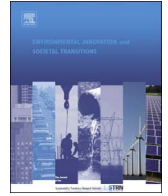




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Original Research Paper

Sustainability transitions and the state

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ABSTRACT

Sustainability transitions is an emerging field of research that has produced both conceptual understandings of the drivers of technological transitions, as well as more prescriptive and policy-engaged analyses of how shifts from unsustainable to sustainable forms of production and consumption can be achieved. Yet attention towards the role of the state is underdeveloped in the field. The significance of this neglect has become more apparent in particular due to the heightened urgency around the need to tackle climate change and energy security, where there are increasing calls for an enhanced role for the state. This paper sets out to advance understandings of the multiple and conflicting roles that states play in transitions. It first addresses key weaknesses in the way the state has been examined thus far. Second, it highlights theoretical resources and conceptualisations of the state that can help scholars of transitions open up new and more productive avenues for understanding drivers and barriers to sustainable transitions drawing on examples from different sectors, regions and issue areas.

1. Introduction

Large-scale, society-wide shifts in infrastructures and the provision and consumption of services and resources, as befit notions of transition and transformation, imply a key role for the state. Despite years of neo-liberal ideological assault on the efficiency and effectiveness of the state in Europe and North America and the global South through the influence of global economic institutions such as the World Bank and IMF, the role of the state is being reconsidered both in policy circles and by researchers studying approaches to sustainability transitions (Grin et al., 2010). There is a growing recognition that from protecting niches, nurturing research and technological innovation through to industrial policy, regulation and enforcement, the range and depth of powers that only the state can call upon will be required if radical and rapid transitions are to be achieved which allow humanity to operate within planetary boundaries (Rockström et al., 2009). This recognition has reinvigorated debates about the state and environmental crisis, drawing on earlier contributions around the prospects of a green state (Barry and Eckersley, 2005; Eckersley, 2004).

The role of the state has been discussed more narrowly in economic approaches to key sustainability challenges such as climate change. Here the emphasis is on the role of the state in enforcing property rights to enable trading, establishing pricing mechanisms and articulating minimum standards, where a theory of the state tends to be implied rather than articulated (Grubb, 2013; Stern, 2007). Instead, a set of normative recommendations are proffered about what a 'night watchman' state should do to achieve 'optimal policy outcomes' (Mabey et al., 1997) assumed to be achieved by facilitating the smooth running of a self-regulating market. Neo-institutional and evolutionary economics approaches meanwhile allow for a greater appreciation of the active and potentially positive role of the state in shaping policy outcomes (Jacobs and Mazzucato, 2016; Mazzucato, 2015; Foray et al., 2012). The state is also being brought back through the renewed attention to 'industrial policy' where the state plays a more active role in directing

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policy instruments towards addressing ‘market’ and ‘coordination’ failures as part of a more long-term strategy to support industry (Aiginger, 2014; Bianchi and Labory, 2011; Pegels, 2014; Pegels and Lütkenhorst, 2014; Peneder, 2016; Stiglitz et al., 2013). However, most accounts stop short of furnishing an explanation for how and why states behave the way they do, less still with regard to processes of transition with which we are concerned here.

In the burgeoning field of sustainability transitions more specifically, the state has been implicitly acknowledged, through increasing focus on politics and power (Geels, 2014), incumbency (Smink et al., 2013), institutional perspectives (Lockwood et al., 2016) and a focus on the destabilisation (Turnheim and Geels, 2013) and discontinuity of regimes (Johnstone and Stirling, 2015). While themes related to the state are becoming a more central focus in sustainability transitions, understanding the state as a focal point of analysis – as opposed to broader institutional account of decision-making – remains understudied. There is a need to further understand not just the role of a state, but also to delve deeper into the nature of the state in different contexts in more relational terms. Our focus is not normatively on whether the state is a good or bad thing and what its role should be, but rather on developing understandings of the state from diverse literatures to enrich understandings of sustainability transitions. What we provide here then is not a neat multi-dimensional conceptual model of the state that can be applied as a whole to case studies of transitions. Rather, we outline a framework for understanding different aspects of state power and ways of thinking about the state that can be adapted and selected according to their relevance by transition scholars to understand the sector, region and period of time they are studying.

After reviewing discussions of the state in sustainability transitions thus far, we introduce five themes and the literatures which address them. These literatures and themes afford a more multi-faceted and inter-disciplinary reading of the state drawn from political economy, international relations, innovation studies, development studies and geographical perspectives. First, we discuss *historical* understandings of the functions and capabilities of states. Second, we focus on *global and spatial* readings of state-society complexes, given the diverse geographies of statehood that exist around the world. Third, *multi-dimensional* understandings of the full range of state power and functions that might be pertinent to their role as agents of transition and transformation beyond the realm of technology policy are outlined. Fourth, we discuss more *relational* and less zero-sum and static notions of power than are often ascribed to the state, enabling an appreciation of the state’s embeddedness in particular social relations. Fifth, we consider the *material* characteristics of technologies and how commitments to certain technologies may (re)produce particular types of decision making and require particular types of state; but also how the institutional configurations of the state may benefit or inhibit certain forms and uses of technology. We argue that these approaches offer an important resource for developing understandings and pursuing new avenues of research about the processes through which diverse configurations of the state are constituted. With the state becoming an increasingly important point of reference in the literature, these insights will offer a useful resource for research on key current themes in sustainability transitions including understanding politics and power in transitions, accelerating transitions, as well as fostering understandings of why transitions proceed along very different trajectories in different transitions contexts.

The rest of this article proceeds as follows. Before drawing upon relevant insights from a range of literatures on how to theorise and comprehend state practices, we first summarise some of the ways in which the state is currently conceptualised in the literature on socio-technical transitions in Section 2. We outline how although there has been implicit recognition of the crucial role played by the state in sustainability transitions, the state has not for the most part been examined as a focal point of enquiry in those debates. Section 3 outlines the five perspectives on the state, drawing on conceptual resources that help us to understand what we argue are key, yet neglected, dimensions of the state in socio-technical transitions. In the concluding discussion, we return to the broader implications of these insights for the field of sustainability transitions more generally and future research on the state in particular.

2. The state in sustainability transitions

2.1. The implicit presence of the state in sustainability transitions

Sustainability transitions is a burgeoning field of research that seeks to understand how transitions from unsustainable to more sustainable systems across a range of sectors including energy, transport, food and water can be initiated, as well as working with policy actors to implement such changes (Markard et al., 2012). There are varied strands to this work including insights from evolutionary economics (Dosi, 1982; Hughes, 1989; Nelson and Winter, 1982), technology studies (Bijker, 1997; Latour, 1996), and structuration theory (Giddens, 1984). Particularly prevalent in this literature has been the development of the ‘Multi Level Perspective’ (MLP) (Geels and Schot, 2008).

The MLP focusses on the interactions between ‘niche’, ‘regime’ and ‘landscape’ levels in understanding how incumbent (and unsustainable) technological regimes can be ‘destabilised’ through ‘niche’ developments. Niches refer to protected spaces including new innovations, technologies, actor configurations and institutional arrangements that replace and transform technological systems in energy, food, transport, and water, as part of transitions to sustainability (Geels, 2002; Kemp, 1994; Kemp et al., 1998; Rip and Kemp, 1996). Traditionally, most research utilising the MLP has been focussed on the ‘focal regime configuration’ entailing niche-regime dynamics (Johnstone and Stirling, 2015). The ‘landscape’ level, that refers to a range of ‘exogenous’ factors to the focal regime configuration – including the state – has generally remained a secondary concern. Geels and Schot (2007) refer to ‘internal’ factors of a socio-technical regime and niche in which the primary focus remains on the economics, institutions, cultural rules and norms of the interactive focal configuration of niche and regime. ‘External’ (and usually secondary) concerns of the ‘landscape’, refer to a very broad range of factors including other institutional perspectives (such as ‘varieties of capitalism’), political and cultural contextual factors or how ‘paradigms’ differ between national contexts (Kern et al., 2014). Other factors also included in the landscape can include phenomena ranging from ‘protest’ movements (Schmitz and Scoones, 2015) ‘long-range’ economic or environmental change, to unpredictable ‘shocks’ like financial crises or disasters such as a major accident (such as the Fukushima nuclear disaster in 2011)

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