Chapter 2

Socio-technical transitions in farming: key concepts

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Introduction

Transition studies usually focus on processes of radical change at the level of a country, or even at the international level. Since a transition can only be ascertained in hindsight, many of these studies are historical. The case studies presented in this book differ from many other studies on transition to sustainability in several ways: the focus is on emerging transitions (transitions in-the-making) and we focus on a smaller spatial level, that of the region. These specifications allow us to zoom-in on the niche-regime interactions that play a key role in the 'take-off' phase of a transition; when a niche engages with the regime to initiate radical technical, institutional and structural changes.

The case studies presented in this book were selected because they have the potential to contribute to a transition to sustainability in agriculture. They focus on new developments that question the dominant paradigm, calling into question the basic assumptions of the existing regime in a fundamental way. To achieve radical change, the niche is involved in a whole complex of interrelated changes including, for example, new beliefs and values; new technologies and practices; new configurations of actor groups; new networks or new policies.

This chapter presents the core characteristics of studies of 'socio-technical transitions to sustainability', focusing on the multi-level perspective and niche-regime linking. It includes a very brief overview of previous work on niche-internal processes, which was situated within research on (endogenous) rural development. Finally, some core concepts on transitions within farming will be discussed: the need of a niche to cope with the complexity and unpredictability of societal change process; the role of power in resisting and steering transitions; the politics involved in defining sustainability in agriculture; and the role of changing rules and values to engender transitions.

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Socio-technical transitions to sustainability

Characteristics of transition studies

Transition studies build on a wide range of theoretical backgrounds (Geels and Schot, 2010). These include evolutionary economics, which focuses on long-term processes and developed the concept of technological regime to understand coordination within a population of firms. They also include sociology, especially structuration theory (Giddens, 1984), which assumes knowledgeable, interpretive actors that enact rules and structures, and where structures guide but do not determine action. Furthermore, they draw heavily on innovation studies and on science and technology studies (STS) which have shown the complexity, fluidity and contingency of technological change (Elzen *et al*., 2004b).

The concept of co-evolution denotes the interaction between societal subsystems which influence the dynamics of the societal system under study. Indeed, as economic, cultural, technological, ecological and institutional subsystems interact, they respond to changes in each other and adapt. Understanding transitions thus means that structures, cultures and practices of a societal system are analysed in an integrative manner (de Haan and Rotmans, 2011). Structures include the formal, physical, legal and economic aspects that enable or restrict practices. Cultures include the cognitive, discursive and ideological aspects involved in sense-making. Finally, practices include the routines, habits and procedures through which actors (individuals, organizations) maintain the functioning of the societal system. Since structures, cultures and practices co-evolve, it implies that in a transition, they are fundamentally changed so that the way the societal system functions is profoundly altered (de Haan and Rotmans, 2011).

Within studies of socio-technical transitions, two broad approaches can be distinguished. Firstly, there are ***historical studies*** of completed socio-technical transitions (e.g. the shift from sailboats to steamships (Geels, 2002) or from horse-drawn carriages to automobiles (Geels 2005)). They were driven by the commercial motivation of pioneers and entrepreneurs who developed the technology. They were not planned or managed by policy. Their objectives were not determined beforehand, but the transitions and their directions emerged as a result of co-evolutionary processes involving a variety of societal influences (Slingerland and Rabbinge, 2009). Thus, while normative changes were often involved, they were not the main drivers.

Secondly, there are studies of ***current societal changes***. These often explicitly focus on 'transitions to sustainability', which is a normative goal and thus there is an (implicit) intention to steer them in the 'right' direction (Grin *et al.,* 2010). As these are on-going processes and future developments cannot be predicted, it is uncertain whether the outcome will be limited to incremental change or whether there will be a radical transformation.

Whilst for historical studies it is clear what changes were brought about, for studies of ongoing processes it remains a challenge to distinguish incremental change processes which are ongoing in any regime, from those change processes which will – eventually – lead to systemic, radical change and thus qualify as 'transition'.

The multi-level perspective

The multi-level perspective views transitions as non-linear processes that result from the interplay of developments at three analytical levels: niches (the locus of radical

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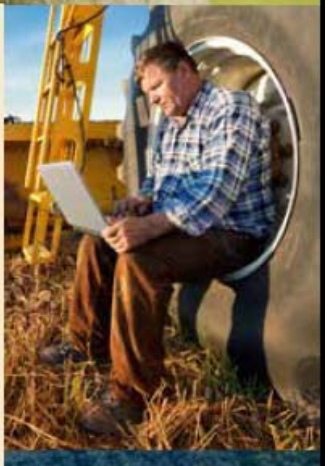

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