



Transformation

and sustainability in agriculture

Connecting practice with social theory

edited by:
Sietze Vellema

Transformation and sustainability in agriculture

Transformation and sustainability in agriculture

Connecting practice with social theory

**edited by:
Sietze Vellema**



*Wageningen Academic
P u b l i s h e r s*

ISBN 978-90-8686-161-3
e-ISBN: 978-90-8686-717-2
DOI: 10.3920/978-90-8686-717-2

First published, 2011

© Wageningen Academic Publishers
The Netherlands, 2011

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned. Nothing from this publication may be translated, reproduced, stored in a computerised system or published in any form or in any manner, including electronic, mechanical, reprographic or photographic, without prior written permission from the publisher:

Wageningen Academic Publishers

P.O. Box 220

6700 AE Wageningen

The Netherlands

www.WageningenAcademic.com

copyright@WageningenAcademic.com

The individual contributions in this publication and any liabilities arising from them remain the responsibility of the authors.

The publisher is not responsible for possible damages, which could be a result of content derived from this publication.

Table of contents

Acknowledgements	11
Chapter 1 – Transformation and sustainability in agriculture: connecting practice with social theory	13
<i>Sietze Vellema</i>	
1.1 Context	13
1.2 Management of transitions	13
1.3 Transition management and theoretical pluralism	14
1.4 Connecting theory and practice	16
1.5 A word on methodological choice	17
References	18
Chapter 2 – New institutional economics: Douglass North and Masahiko Aoki	21
<i>Gerdien Meijerink</i>	
2.1 Introduction	21
2.2 NIE's explanation of social change	21
2.3 Applying NIE to the field of transition	27
2.4 Tensions between NIE and the assumptions of transition management	30
2.5 Perspectives for acting	31
2.6 Conclusion	32
References	32
Chapter 3 – Social systems and social engineering: Niklas Luhmann	35
<i>Kristof van Assche, Martijn Duineveld, Gert Verschraegen, Roel During and Raoul Beunen</i>	
3.1 Introduction	35
3.2 Social systems: an introduction	35
3.3 System innovation and transition management in the Dutch landscape	37
3.4 Luhmannian responses to the Dutch transition management discourse	38
3.5 Conclusions: limits and possibilities of steering transitions	43
References	45
Chapter 4 – The role of social networks: Mark Granovetter	49
<i>Machiel Reinders</i>	
4.1 Introduction	49
4.2 Strong and weak ties	49
4.3 Applying strength-of-ties theory to the transition literature	51

4.4 Tensions between both theoretical perspectives	53
4.5 Perspectives for action	54
4.6 Conclusion	55
References	55
Chapter 5 – Doubt management as a tool for change: Karl E. Weick <i>Trond Selnes and Catrien Termeeer</i>	57
5.1 Maps of the unknown	57
5.2 The concept of sensemaking	58
5.3 Making sense of transitions	62
5.4 Doubt management as action	64
5.5 Conclusion	67
References	67
Chapter 6 – Power and discipline in transitions: Michel Foucault <i>Martijn Duineveld and Guus Dix</i>	69
6.1 Introduction	69
6.2 Foucault	70
6.3 Disciplining, subjection and exclusion	72
6.4 Michel Foucault and the transition researcher or manager	75
References	77
Chapter 7 – Materiality, nature and technology in agriculture: Ted Benton <i>Sietze Vellema</i>	79
7.1 Introduction	79
7.2 Explaining social change: an argument for materialism	79
7.3 Complementarities between materialism and transition thinking	81
7.4 Contradictions between materialism and transition thinking	84
7.5 An application: materiality in agriculture	86
7.6 Conclusion and perspectives for social action	88
References	89
Chapter 8 – Sustainable greenhouse horticulture and energy provision: two regional transition processes compared	91
<i>Jan Buurma and Marc Ruijs</i>	
8.1 Introduction	91
8.2 Reconstruction of two regional development projects	92
8.3 Regional horticultural development areas in terms of transition management	100

8.4 Theoretical reflection	105
8.5 Conclusions	110
References	111
Chapter 9 – The reconstruction of livestock farming in the Netherlands	113
<i>Carolien de Lauwere and Sietze Vellema</i>	
9.1 Introduction	113
9.2 The time scale of the reconstruction process	114
9.3 The reconstruction process in terms of transition	117
9.4 Theoretical reflection on the reconstruction process	119
9.5 Synthesis	124
References	125
Chapter 10 – Seed provision in developing economies: converting business models	131
<i>Rolien C. Wiersinga, Derek Eaton and Myrtille Danse</i>	
10.1 Introduction	131
10.2 Reconstruction of the process	132
10.3 Transition reflection	136
10.4 Theoretical reflections	139
10.5 Conclusions	145
References	146
Chapter 11 – Changing the crop protection or pesticide use regime in the Netherlands: an analysis of public debate	147
<i>Jan Buurma</i>	
11.1 Introduction	147
11.2 Reconstruction of the public debate on crop protection and pesticides	147
11.3 The regime change in terms of transition management	154
11.4 Theoretical reflection	157
11.5 Conclusion	163
References	163
Contributors	165

Acknowledgements

The research, exchange and discussion that contributed to this volume was supported by the Netherlands Ministry of Agriculture, Nature and Food Quality through its Knowledge Base Funds (in the programme ‘Transition Processes, Institutions, Governance and Policy’, project KB-07-003-0001). I highly appreciate the sustained commitment of all the authors to this learning journey, which started in 2008 with a series of intense and creative working sessions bringing theory and practice together and which required open minds and respectful exchanges of ideas. The continued support of Krijn Poppe to make this project possible was of great value. The cross-boundary knowledge and actions of Jan Willem van der Schans were an inspiration in this process. Initially, Eric ten Pierick guided the research team through the pallet of transition literature. Michelle Luijben skilfully edited the contributions to this volume.

Wageningen, 2010

Sietze Vellema

Chapter 1

Transformation and sustainability in agriculture: connecting practice with social theory

Sietze Vellema

1.1 Context

This book is about how to analyse the social and institutional mechanisms that enable or hinder endeavours to change the way agriculture is done and food is provided. In recent decades, agriculture and food provision have faced a series of events often labelled as ‘crises’. These have included damage due to increased pressure on natural environments, food scares related to contamination and animal diseases, public fears of genetic modification, and civil protests against the way animals are kept and treated. Since 2001, the Netherlands government has taken upon itself the vast task of initiating a selection of ‘planned’ transitions, in response to these persistent and complex problems and with the aim of achieving a sustainable society within a period of 30 years (Slingerland and Rabbinge, 2009). Sustainable agriculture is one of the selected transition areas, besides energy, mobility, and biodiversity and natural resources.

A transition arena provides room for long-term reflection and prolonged experimentation.¹ The transition arena for sustainable agriculture is an evolving network assembling a variety of stakeholders, projects and interventions in a joint endeavour to realise a transition of the agro-food complex. The authors contributing to this volume have, to varying degrees, been involved in projects, interventions and experiments embedded in this arena.

1.2 Management of transitions

Parallel to this combination of policy, practice and research, scholarly work has begun to theorise about transition processes, from the premise that such change processes do not have a predictable outcome. This literature adopts a strong process focus in describing the management of transitions and seeks to combine complexity theory with new governance models (Rotmans *et al.*, 2005; Loorbach and Rotmans, 2006). It does this with an open mind to participatory approaches for steering, to social learning and to iterative processes between shared vision and open-ended experimentation (Blanken *et al.*, 2004). This conceptualisation of transition processes also suggests the need for new forms of governance (Hendriks and

¹ The Dutch Research Institute for Transition (DRIFT) plays an important role in setting the knowledge agenda for transition thinking in the Netherlands. Terminology used in this volume is partly derived from its work (see <http://www.drift.eur.nl/>).

Grin, 2007). This literature brings on board concepts from a wide range of social science disciplines, such as sociology, culture sciences, and policy analysis. It has a strong interest in how small or incremental changes or technological improvements in strategic niches eventually result in a more drastic transformation of large systems (Geels and Raven, 2006). At the same time, it acknowledges that change processes towards sustainability comprise more than single technologies or organisations; they are the result of the combination and mutual reinforcement of technological, economic, ecological, social-cultural and institutional development at different levels (Rotmans *et al.*, 2001).

This volume uses the multi-level perspective (Geels and Schot, 2007) to visualise change processes, and its empirical contributions benefitted from this in picturing the chronology of events in specific change processes. Seeds of change can be observed in niches. Niche innovations can be self-invented or result from external pressures. The rules, routines and institutions driving continuity are located at the level of the socio-technical regime. Regimes show some level of stability, and from a transition perspective the question is what enables the reformation or reconfiguration of a regime. Next to the niche and regime level, the landscape level is considered to be largely exogenous to the transition process itself. But external pressures inducing change or creating windows of opportunity may come from this level, determined by slow changes in material infrastructure, culture, social structures, worldviews and paradigms.

Consequently, conceptualisation of a transition process shifts attention to the level of socio-technical systems (Geels, 2004). It sees transition processes not as the result of identifiable actors or factors, but caused by failures of a systemic nature (Kemp *et al.*, 2007). This is reflected in the presentation of transition processes in terms of speed and direction, and also as an S-curve revealing the seed of change gradually reconfiguring and stabilising a new socio-technical regime (Loorbach and Rotmans, 2006). This visualisation helps us to consider the long-term and systemic implications of change processes, which, in the short term, may look whimsical, and to work on intermittent and partial solutions for a systemic problem (Rotmans *et al.*, 2005).

1.3 Transition management and theoretical pluralism

Transition management seems to have a strong interest in building systems, and it strongly emphasises technological experimentation (Hegger *et al.*, 2007). This may result in a neglect of various dimensions of human behaviour and social organisation; and it may ignore experiments with forms of social organisation, institutional arrangements and behavioural patterns (for an example see Vellema *et al.*, 2006). The premise of the work presented in this volume is that to understand what enables or constrains processes of change it is necessary to further develop a socialised perspective on the management of transitions and to theorise more explicitly about how conditions at the regime level, manifested in rules, routines

and behavioural patterns, both shape the conditions for scaling up micro experiments and respond to signals from these experiments.

The literature on transition management under conditions of uncertainty and complexity is explicitly interested in the capacity to (re)engineer systems, the capacity to steer processes of socio-technical change, and the capacity to scale up experiments as a pathway to modify or transform regimes. The contribution of this volume is to further unpack these capacities by mirroring transition management thinking in a selection of social theories. In contrast to what transition management tries to do, namely attempting to integrate everything into one framework, this volume explores an approach that rests on a multiplicity of competing theories, as proposed by Dewulf *et al.* (2009). Hence, the volume comprises six theoretical essays, each presenting the merits of an individual theory. Each of these distinct theories is then applied in four case studies of change processes in agriculture and food provision. This is unlike a process which seeks to integrate distinct theoretical accounts and empirical processes into a single framework.

This volume reflects an endeavour to encourage theoretical pluralism. The project in which this volume was realised invited a number of theoretically interested researchers at or related to Wageningen University and Research Centre, to produce a theoretical essay for further use in a dialogue with more practice-oriented researchers. The essays were discussed in the team, and the usefulness of the theoretical insights was concretised in the context of four case studies. Towards the end of the joint exercise, the so-called ‘theorists’ were challenged to elaborate on the action perspectives or intervention repertoires hidden within the theoretical exposes. This served to further link the theories with the reality of practitioners, policy-makers and transition managers, who must take informed decisions about how to act and make change processes work within a specific context.

The social theories in this volume were selected along two axes, to ensure variety, and with a specific interest in theories that focus attention on the level of the socio-technical regime. Theories were placed on the ‘actor-system’ axis and on the ‘idealism-materialism’ axis. Gerdien Meijerink examines how new institutional economics, as developed by Douglass North and Masahiko Aoki (Chapter 2), combines a focus on individual actors with incentives for changing behaviour. A system perspective on human behaviour and social engineering is reflected in the work of Niklas Luhmann, presented in the chapter by Kristof van Assche, Martijn Duineveld, Gert Verschraegen, Roel Daring and Raoul Beunen (Chapter 3). The work of Mark Granovetter, discussed by Machiel Reinders (Chapter 4), relates change to both a micro perspective on individual behaviour and a meso perspective on patterns of interaction within social networks. Trond Selnes and Catrien Termeer (Chapter 5) use the work of Karl Weick to examine how actors construct and make sense of change under conditions of uncertainty within organisations. Martijn Duineveld and Guus Dix (Chapter 6) draw on the work of Michel Foucault to detect three mechanisms – disciplining, subjection and exclusion – which make explicit how the entanglement of power and knowledge conditions human

behaviour and social action. In Chapter 7, Sietze Vellema builds on the work of Ted Benton to incorporate non-manipulable material and natural limits on human-driven change into the analysis of transitions of socio-technical systems.

1.4 Connecting theory and practice

Combining theories provides grounds for a discussion on institutional failures in and the human dimension of transition processes. This is done using four case studies. Moreover, from the practitioners perspective it seems relevant to discern how actors, i.e. the partners in a transition process, behave under certain institutional and material conditions and to identify their room for manoeuvre and their capacity to change matters. Transition is also about making choices and agreeing to cooperate to make things work differently. Therefore, it is relevant to incorporate the mechanisms that induce choices and that install institutional arrangements into understanding systemic change, rather than merely projecting systemic change as an outcome of bounded, mainly technical inventions and experiments that set the socio-technical system in motion in a new direction. The aim in this volume is to find a way to conceptualise transition as an evolving configuration of social and technical realms, of which the precise outcomes are contingent on social choice and behaviour as well as on technological and natural realities.

The four case studies centre on concrete change processes which are embedded in a possible larger transition towards sustainable agriculture and food provision. Each case study reconstructs the chronology of events constituting the change process, and then tries to capture this in terms of transition management. Next, each draws on the six theoretical essays to explore what one can see or expect to observe in the case study when using the set of lenses provided by each distinct theory. The value of this exercise is to allow us to look deeper into the process, and into the mechanisms that bring about change.

In the first case study, Jan Buurma and Marc Ruijs (Chapter 8) seek an explanation of the different development pathways of two horticultural expansion areas in the northern and eastern Netherlands. Both transition processes were driven by national policies and plans to reform agricultural production and to change the way agricultural production is embedded in a specific environment. Differences in the development pace and outcome of the two areas seem to be related to the behaviour of actors and the relations between actors. A similar insight arises from the second case study, in which Carolien de Lauwere and Sietze Vellema (Chapter 9) examine how endeavours to reconstruct livestock farming, partly induced by outbreaks of animal diseases and concerns about animal welfare, touch ground in specific social environments. The case study seeks explanations for local resistance to a potential change towards a more environmentally benign and animal friendly system of livestock farming. In so doing, it is also concerned with how generic and imposed transitions are articulated in the logics embedded in specific localities.

The third case study, by Rolien Wiersinga, Derek Eaton and Myrtille Danse (Chapter 10), focuses on a business model for supplying smallholder vegetable farmers in the South with improved planting materials. The business model is embedded in processes of commercialisation and specialisation in rural areas that have a long history of producing agricultural crops mainly for food security. From the case study, it becomes clear that this change process, linked to general strategies for reducing poverty, is a combination of existing proven technological principles (i.e. hybridisation of seed) and a new institutional architecture featuring a division of labour between farmers and seed companies. Also, the business model is accompanied by new cultural models of what farmers are supposed to be, e.g. entrepreneurs operating in a market-driven environment. The application of a pallet of theoretical insights to the case study opens the black box of what seems to be a straightforward business model and creates space for counterfactual reasoning.

In the last case study, Jan Buurma (Chapter 11) shows that the court proceedings initiated by environmental groups, in the context of fierce public debate, was an important trigger for transforming the pest control regime in Dutch agriculture. It confirms that paying attention to social or institutional experiments is as important as framing transitions in terms of technological novelties. As a result of polarisation and the use of the juridical system, new alliances were brokered which set the way for a drastic modification of the regime of crop protection/pesticide application in the Netherlands. Here again, employing the distinct theories helps us to unravel various dimensions linked to this process of institutional change.

1.5 A word on methodological choice

This volume's collection of theoretical essays and case studies opens a discussion on connecting practice with social theory. This required a methodological endeavour to enable theoretical pluralism. The chosen approach enriched the reconstruction of the selected case studies by encouraging a theory-informed search for mechanisms hidden within the change process (Gerring, 2007). A transition perspective helped us to look at outcomes of change processes from a long-term and systemic viewpoint. The contribution of the work presented here is to enable us to open the black box of time and to place specific change processes by focusing attention on the mechanisms, with causal properties, that produce institutional change. This provides the basis for theory-driven empirical inquiry and leads to a research design based on the combination of researchable, alternative hypotheses. Methodologically, it suggests confederating empirical inquiry with a network of theories. This will make it possible to borrow, consolidate, or pass on explanatory structures and to relate a set of statements or hypotheses to segregated observations. This volume takes a first step in doing so.

Theoretical pluralism, i.e. pitting alternative theories against the same body of data (Denzin (1970) uses the term 'theoretical triangulation'), may be able to achieve the blend between theory and empirical research necessary to get inside the black box of transitions. Since transitions occur usually once, and do not repeat themselves in precisely the same way, it

is important to find methodological handles to detect traces of the causal powers at work in specific cases (Blatter and Blume, 2008). This volume suggests that future analyses of transition processes need to find a way to incorporate theory-driven expectations and to allow competing candidate mechanisms to be assessed in relation to data associated with the mechanisms themselves and with the context and outcomes concerned (Perri 6, personal communication, 2008). The often whimsical and uncertain reality of practice may benefit from theoretical pluralism, as it permits new and unexpected findings to challenge the assumptions prevalent in policy- and planning-driven transition processes.

References

- Blanken, H., A. Loeber and D.J. Joustra (2004) *Veranderen is leren, leren is veranderen*. NIDO Transitiepaper 9, The Hague: Dutch National Initiative for Sustainable Development (NIDO) and Ministry of Housing, Spatial Planning and the Environment (VROM).
- Blatter, J. and T. Blume (2008) In search of co-variance, causal mechanisms or congruence? Towards a plural understanding of case studies. *Swiss Political Science Review* 14 (2): 315-56.
- Denzin, N.K. (1970) *The Research Act: a theoretical introduction to sociological methods*. Aldine, Chicago, IL, USA.
- Dewulf, A.E., C.J.A.M. Termeer, R.A. Werkman, G.R.P.J. Breeman and K.J. Poppe (2009) Transition management for sustainability: towards a multiple theory approach. In: K.J. Poppe, C. Termeer and M. Slingerland (eds.). *Transitions Towards Sustainable Agriculture and Food Chains in Peri-Urban Areas*. Wageningen Academic Publishers, Wageningen, the Netherlands, pp. 25-50.
- Geels, F. (2004) From sectoral systems of innovation to socio-technical systems: insights about dynamics and change from sociology and institutional theory. *Research Policy* 33 (6-7): 897-920.
- Geels, F. and R. Raven (2006) Non-linearity and expectations in niche-development trajectories: ups and downs in Dutch biogas development (1973-2003). *Technology Analysis and Strategic Management* 18 (3/4): 375-92.
- Geels, F. and J.W. Schot (2007) Typology of sociotechnical transition pathways. *Research Policy* 36 (3): 399-417.
- Gerring, J. (2007) The mechanistic worldview: thinking inside the box. *British Journal of Political Science* 38 (1): 161-79.
- Hegger, D.L.T., J. Van Vliet and B.J.M. Van Vliet (2007) Niche management and its contribution to regime change: the case of innovation in sanitation. *Technology Analysis and Strategic Management* 19 (6): 729-46.
- Hendriks, C.M. and J. Grin (2007) Contextualizing reflexive governance: the politics of Dutch transitions to sustainability. *Journal of Environmental Policy and Planning* 9 (3-4): 333-50.
- Kemp, R., D. Loorbach and J. Rotmans (2007) Transition management as a model for managing processes of co-evolution towards sustainable development. *International Journal of Sustainable Development and World Ecology* 14 (1): 78-91.
- Loorbach, D. and J. Rotmans (2006) Managing transitions for sustainable development. In: X. Wiczorek and A.J. Wiczorek (eds.). *Understanding Industrial Transformation: views from different disciplines*. Springer, Dordrecht, the Netherlands.

- Rotmans, J., R. Kemp and M.B.A.V. Asselt (2001) More evolution than revolution: transition management in public policy. *Foresight* 3 (1): 15-32.
- Rotmans, J., D. Loorbach and R. Van der Brugge (2005) Transitiemanagement en duurzame ontwikkeling; co-evolutionaire sturing in het licht van complexiteit. *Beleidswetenschap* 19 (2): 3-23.
- Slingerland, M. and R. Rabbinge (2009) Introduction. In: K.J. Poppe, C. Termeer and M. Slingerland (eds.). *Transitions Towards Sustainable Agriculture and Food Chains in Peri-Urban Areas*. Wageningen Academic Publishers, Wageningen, the Netherlands, pp. 13-23.
- Vellema, S., D. Loorbach and P. Van Notten (2006) Strategic transparency between food chain and society: cultural perspective images on the future of farmed salmon. *Production Planning and Control* 17 (6): 624-32.

Chapter 2

New institutional economics: Douglass North and Masahiko Aoki

Gerdien Meijerink

2.1 Introduction

This chapter discusses the possible contribution of new institutional economics (NIE) to the transition literature. The two fields seem to have developed in parallel universes, and there has been no cross-fertilisation. This essay presents some possible starting points for exchange. In an overview of NIE, Brousseau and Glachant (2002: 4) say, '[T]he strength of NIE lies in its proposal to analyze governance and coordination in all sets of social arrangements.' They warn, however, that 'the design of institutional systems is not based on optimisation computation but on trial and error, on the implementation of solutions that should be recognized as imperfect and temporary.... In such a context, it is essential to take into account the management of changes together with the processes of evolution.' NIE thus has something to say about managing transitions, although it might provide a slightly different perspective on change management than that in the transition literature.

This chapter first discusses how NIE explains social change, including a review of some concepts used in NIE. It then shifts focus to what NIE adds to the literature on transition management and looks at tensions between NIE and some of the assumptions of transition management. It concludes by providing starting points for using concepts of NIE in management of change. The chapter draws primarily on two authors from the NIE school of thinking: Douglass North (1990, 2005) and Masahiko Aoki (2001, 2007). North developed several critical ideas about what institutions are, and Aoki elaborated on these. Other literature is used to expand on or back up their thinking.

2.2 NIE's explanation of social change

2.2.1 Institutions

The well-known definition by North (1990) of an institution is that it consists of the rules of the game in a society. Aoki (2001, 2007) elaborates on this and proposes that institutions are collectively recognised rules and symbols plus behavioural beliefs (expectations) of agents about other players' choices and intentions. Players base their own behaviour (strategies, actions, etc.) on these beliefs. These sets of beliefs are also called 'mental models' (Denzau and North, 1994) or 'social models' (Eggertsson, 2005). 'Meaningful rules' are those that