Understanding the System Context of Alternative Food Supply Chains

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Abstract

This paper focuses upon the case of alternative food supply chains (AFSCs) as a "laboratory" for the implementation of sustainability concepts on a larger scale. To realize this type of up-scaling, two important conditions should be fulfilled: the initiatives have to combine a performing internal organisation with the ability to understand and interact with the larger food system. To explore these concepts, the theory of hybrid organisations and the system innovation policy approach are discussed. Theory and empirical evidence learns that both concepts are complementary, as they both stress the importance of networking with actors that can be situated within or outside the supply chain.

1. Introduction

In recent years, an impressing number of alternative supply chains (AFSCs) have been established in order to meet the increasing consumer demand for safe and high quality food products, but also a means to increase the generate extra added-value. This evolution has been studied by a wide field of authors, who have focused on different dimensions of AFSCs such as their role in rural development (Marsden et al., 2000; van der Ploeg et al., 2000), their ability their guarantee a specific product quality (Henson & Reardon, 2005; Ilbery & Kneafsey, 2000) and their governance structures (Ménard, 2004; Ménard & Valceschini, 2005; Raynaud et al., 2002). In this paper, we work on a conceptual framework that allows to study the up-scaling of AFSCs that market products with a sustainability claim and the crucial factors that determine the success of this process. Up-scaling has hereby to be distinguished from growth. An initiative grows when partners do not change their strategies and the existing resources are used more intensively, while scaling up implies a major change in the strategic vision because of new outlets and/or new investments, new partners, but also a different organisations of resources. Examples of scaling up are the exploration of new markets with new products, the establishment of new spin offs by an initiative and the replication of the model of an initiative in another region (Jahn et al., 2006).

In this paper, we argue that it is not sufficient that an AFSC optimizes its internal functioning to be successful, but it should also be able to take the context of the system into account and to interact with different actors, organisations and institutions. We will therefore use insights of the economics of hybrid organisations and the SI policy approach to identify key success factors. We consider both concepts to be extremely complementary, as they both stress the importance of networking with other chain actors, organisations and institutions, which can be within or outside the supply chain. The challenge is of this paper is to come to an integrative analysis that describes the networking and collaboration between firms and the central authority of the AFSC on the one hand and with actors in the wider network on the other. We will therefore confront the internal functioning and external networking to study an initiative's performance.

Before addressing the performance, we will first describe the main characteristics of the theoretical concepts and the possibility to use them. Consequently, we explore the coherence between both concepts through empirical evidence of 14 European AFSCs. The final section then discusses the conclusions and gives some first indications on how to study the relationship between the commercial performance and sustainability of an AFSC, internal organisation and external networking.

2. Assessing the internal performance of AFSCs – the economy of hybrid organisations

2.1 Theoretical context of hybrid organisations

The theory of hybrid organisations, which is situated in the field of New Institutional Economics (NIE), is used to analyse the internal organisation of initiatives. The NIE theory focuses on the organisation of economic activities and institutional structures, with the basic assumptions that governance structures have an important impact on the economic performance of the stakeholders involved, and that governance structures can be analysed using rigorous theoretical and empirical methods (Arrow, 1974).

An important tool hereby are transaction costs, or the costs that are associated with carrying out a transaction or the costs of organising a transaction with information costs, negotiation costs and monitoring and enforcement costs as the most important examples. Transaction cost economics then focuses on how transactions are organised in order to minimise transaction costs and three critical dimensions are hereby identified: uncertainty, frequency and asset specificity (Coase, 1937; Hubbard, 1997; Verhaegen & Van Huylenbroeck, 2002) A comprehensive discussion of transaction costs and the characteristics of transactions in the context of AFSCs can be found in Réviron et al. (forthcoming).

2.2 The governance of hybrid organizations

Good governance of supply chains makes it possible for transaction partners to realise and share the mutual gains of an exchange or cooperation. A governance structure is hereby defined as the set of institutional arrangements within which a transaction is organised (McFetridge, 1994; Ménard, forthcoming; Williamson, 1985, 1991). Hybrid organisations, as a specific governance structure between markets and hierarchies, can then be defined as arrangements that involve deliberate coordination of a subset of activities among partners who maintain autonomous property rights and who remain independent as decision makers in last resort (Ménard, 2004). A plenitude of organisational forms comply with this definition and joint ventures, franchising, commercial networks, subcontracting, cooperatives are only a handful of examples (Ménard, 2004; Ménard & Valceschini, 2005). Within this diversity, Ménard distinguishes four categories of hybrid organisations based on their asset specificity and the transaction costs: (i) *trust* is the closest to market arrangements as decisions are decentralised and loose coordination is implemented through mutual influence and reciprocity; (ii) *relational networks* have formal rules and conventions that frame relationships among agents and restrict the risk of opportunism; (iii) *leadership* emerges when a firm establishes its authority over the partners, because it holds specific competencies or occupies a key position in the chain and (iv) *formal governments* function as a private bureau with some attributes of hierarchy as a significant subset of the partners' decisions is coordinated through a quasi-autonomous entity. In all cases, the partners remain independent and may even compete on segments of their activities (Ménard, 2004).

Another classification was proposed by Verhaegen and Van Huylenbroeck (2002), and these authors consider the partial transfer of decision power, especially concerning quality control issues, as the key factor to distinguish hybrid forms. Three categories of hybrids can then be distinguished: (i) *framework governance*, whereby quality implies non-observable and non–standardised attributes but their is no strive for quality increase nor product standardisation; (ii) *coordinating governance*, the intended quality is developed by one level of actors in the chain and (iii) *participating governance* implies that quality requires deployment of uniform resources and/or uniform production processes.

The confrontation of both classifications for a set of AFSCs studied within the SUS-CHAIN project learns that there is a positive correlation between a strive for common quality and delegation of authority to the centre of co-ordination (see Figure 1. Classification of SUS-CHAIN case studies according to their internal organisational form and their strive for quality 1). This correlation is evaluated to be logic and natural, as any initiative needs an effective and efficient decision mechanism to realize and coordinate its promise (Réviron et al., forthcoming). The placement of an initiative on this grid is however dynamic and can change in the initiatives' lifecycle. When an initiative for example decides to create a private brand next to the general organic label it was already using, the organisation is likely to evolve from a framework governance with trust to a co-ordinating governance in a relational network.

Strive for quality / Type of hybrid form	Framework (no strive for quality increase and standardisation)	Co-ordinating (intended quality is developed with technical leeways)	Participating (uniform resources and processes)
Trust (loose coordination)	Cornwall Food programme (UK) High Weald cooperative group (UK) LAMCB (LV)		
Relational network (formal rules and conventions, accepted discipline)	Biomelk Vlaanderen (B)	Westhoek farm products (B) Pistoia Mountain cheese (I) Rye Bread of Valais (CH)	
Leadership (a firm establishes authority over partners)		Uplaender dairy (DE) CAF (I)	CONO dairy (NL) NaturaBeef (CH)
Formal government (a private bureau with some attributes of hierarchy)			Tegut / KFF (DE) De Hoeve (NL) Rankas dairy (LV)

Figure 1. Classification of SUS-CHAIN case studies according to their internal organisational form and their strive for quality

3. Analysis of AFSCs in the context of a system – SI policy approach

3.1 Theoretical context of system innovation

This paper aims to study the potential of AFSCs to scale up, or in terms of transition theory (Rotmans et al., 2001), the potential of innovative niches to penetrate the regime and possibly the transformation of the entire agri-food sector. But, as Green and Foster (2005) state, transforming human activities with respect to food requires a focus on the whole system of agricultural, industrial, retailing and household activities and their interrelationships. This complexity of innovation is also reflected by the system definition of innovation as proposed by Klein Woolthuis et al. (2005): *"Innovation is an interactive, non-linear process in which actors (e.g. firms) in-*

teract with a manifold of other organisations (e.g. research institutes, customers, authorities, financial organisations) and institutions (e.g. regulations, culture)".

The concept of system innovation emphasises on the fact that the innovation process is characterised by reciprocity and feedback mechanisms and three core issues are hereby identified: (i) innovation does not take place in isolation and interaction is central to the process of innovation; (ii) institutions are crucial to economic behaviour and performance as they form the 'rules of the game' that reduce uncertainty in the economic system and (iii) evolutionary processes play an important role by generating variety, by selecting among that variety and by producing feedback from the selection process to the variation creation (Klein Woolthuis et al., 2005).

3.2 SI policy approach

A system failure will occur when these elements are not properly aligned and four types of system failures can be distinguished: (i) *infrastructural failures* refer to the need for a reliable infrastructure; (ii) *institutional failures* consign to the institutional context as a defining and structuring element in the system, whereby a distinction is made between failures of the hard (formal, written) or the soft (informal, rules of the game) institutions; (iii) *interaction failures* involve the interaction between stakeholders within and outside an initiative, which can be too weak or too strong and (iv) *capabilities' failure* concern the initiative's competences to go from one paradigm to another. The system innovation policy approach then confronts the different actors (demand, companies, knowledge institutes and third parties) with the system failures as they were identified above, to analyze the initiative's link with the system and the way in which support should be targeted (Klein Woolthuis et al., 2005).

The visual output of the evaluation of system failures and support granted to the initiative "De Westhoek Hoeveproducten", small non-profit making organisation which brings producers of farm products together who will join forces to enhance the quality and the acknowledgement of farm produce in the region and who will jointly promote these products, is shown Figure 2. Adapted SI-policy framework for the "De Westhoek Hoeveproducten" case (Source: Vuylsteke & Van Huylenbroeck, 2005)1(2005), while Vuylsteke and Van Huylenbroeck (forthcoming) elaborately discuss the concept of system innovation and the analysis of the relationship between AFSC and their context through the SI policy approach.

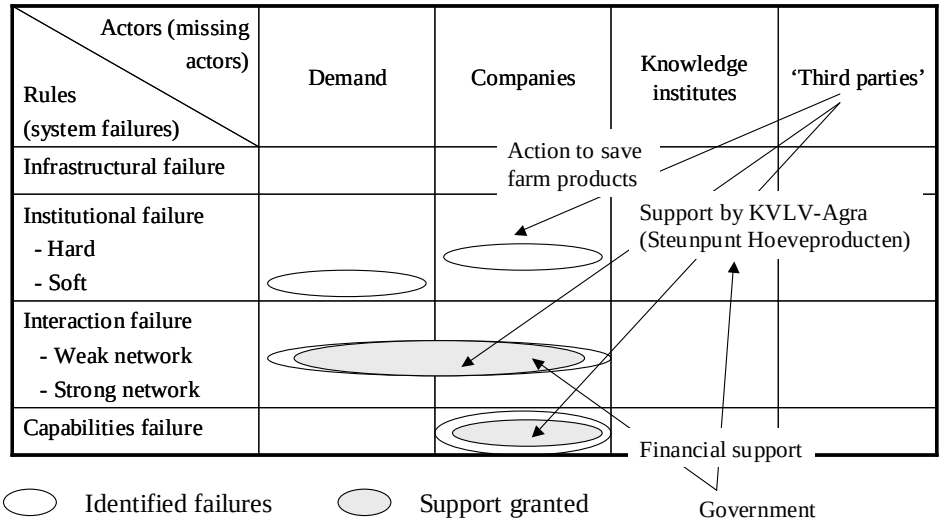

Figure 2. Adapted SI-policy framework for the "De Westhoek Hoeveproducten" case (Source: Vuylsteke & Van Huylenbroeck, 2005)

After this discussion of the two theoretical frameworks that are used in this paper, we will now focus upon the empirical evidence of examples of AFSCs that were studied within the SUS-CHAIN project.

4. Methodology

4.1 SUS-CHAIN research project

This empirical part builds upon the outcomes of the EU 5th Framework project "Marketing sustainable agriculture: an analysis of the potential role of new food supply chains in sustainable rural development". SUS-CHAIN has been carried out by a consortium of academic institutes and NGOs in seven European countries (The Netherlands, United Kingdom, Switzerland, Italy, Belgium, Latvia and Germany. The aim of the project was to assess the potential role of food supply chains in the enhancement of sustainable food production and rural development by identifying critical points in food supply chains which currently constrain the further dissemination of sustainable production and recommend actions that are likely to enhance the prospects for sustainable food markets. Specific attention was hereby given to factors related to the organisational structure of food supply chains and interactions between stages of the chain (www.sus-chain.org).

The core part of SUS-CHAIN consisted of an elaborated analysis of 14 case studies, based on a wide variety of information sources (documentation, archival records, direct observations, participant observation, physical artefacts and individual interviews to informants or to respondents (Brunori & Wiskerke, 2004). The outcomes of each case studies are reflected in reports and a set of indicators on the following core themes: (i) commercial performance and distribution of value added along FSCs, (ii) marketing conception, marketing measures and communication, (iii) public support, (iv) nature of organisation, self-governance and changes during scaling up, (v) impact on rural economies and rural assets and (vi) embeddedness, local networks and locality.

4.2 Method

In order to search the link between the internal organisation of an initiative, its external networking and the eventual performance and scaling up, the data were encoded in the statistical program SPSS 12 to perform a homogeneity analysis. This technique is used to get a better visualisation of the link between different types of initiatives and the characteristics of farmers and exploitations. This technique describes the relation between characteristics and aims to group several similar cases. The result is a two or three dimensional figure that visualised the relation between the categories of the variables and the cases. Homogeneity analysis is a technique for data-reduction that plots cases of the same category near to each other. In a two-dimensional figure, two sets of values are calculated to reach a maximal spreading of the categories. Homogeneity analysis with SPSS allows the use of more than two variables, contrary to correspondence analysis, but has the disadvantage that the interpretation is mainly visual and there are no indicators for the quality and the accuracy of the result. Only eigen values are calculated (SPSS, 1999; Vuylsteke et al., 2003).

4.3 Data

A set of relevant variables was selected based on the theoretical discussions of paragraphs 2 and 3, together with some general descriptive variables. The information on this variables was available through the SUS-CHAIN comparative analysis (Jahn et al., 2006) or was gathered based on the individual case study reports. 1 gives an overview of the variables that included in the analysis and the distribution of the AFSCs over the categories.

Table 1. Variables included in the analysis with their categories and respective frequencies

Variable	**Categories**	**Freq.**
Initiatives	Code for the 14 case studies	
Number of producers involved	Less then 100 producers	8
	Between 100 and 1000 producers	5
	More then 1000 producers	1
Market share in relevant market	Low market share	7
	Medium market share	4
	High market share	3
Commercial performance	Poor performance	5
	Medium performance	1
	Good performance	8
Scaling up	No scaling up	9
	Scaling up	5
Hybrid form	Trust	3
	Relational network	4
	Leadership	4
	Formal government	3
Strive for quality	Framework governance	4
	Coordinating governance	5
	Participating governance	5
Market differentiation	Very competitive market	7
	Medium competitive market (branding)	5
	Low competitive market (certification)	2
Networking	Initiative with low networking profile	4
	Initiative with medium networking profile	8
	Initiative with high networking profile	2
Infrastructural failures	No infrastructural failure identified	10
	Infrastructural failure still present (IFF -)	1
	Infrastructural failure overcome (IFF +)	3
Hard institutional failures	No hard institutional failure identified	8
	Hard institutional failure still present (HIF -)	0
	Hard institutional failure overcome (HIF +)	6
Soft institutional failures	No soft institutional failure identified	8
	Soft institutional failure still present (SIF -)	3
	Soft institutional failure overcome (SIF +)	3
Weak network failures	No weak network failure identified	9
	Weak network failure still present (WNF -)	4
	Weak network failure overcome (WNF +)	1
Capabilities failures	No infrastructural failure identified	5
	Infrastructural failure still present (CF -)	3
	Infrastructural failure overcome (CF +)	6

5. Performance of AFSCs and their potential to scale up

The aim of this paragraph is to explore, through homogeneity analysis, the performance of AFSCs and their potential to scale up in relation with their internal organisation and their external networking. The analysis results in two dimensions with eigenvalues 0,571 (dimension 1) and 0,396 (dimension 2) and a graphical output, which is shown in 2.

The characteristics concerning the AFSCs' commercial performance (indicated by the three ellipses) are situated on a line through the origin, whereby the 'poor commercial performance'-cluster combines a positive score for dimension 1 with a negative score for dimension 2 and 'good commercial performance' is situated in the quadrant with negative and positive values for respectively dimension 1 and 2.

A closer look learns that poor performance is more often linked with framework governance, very competitive markets (without product differentiation), the presence of soft institutional failures and trust as hybrid form. The presence of trust and framework governance in the same cluster was expected based on the findings of Réviron et al. (forthcoming). The same holds for initiatives trying to position a rather generic product in a very competitive market. The homogeneity analysis furthermore illustrates that initiatives with an organisation close to spot markets seem to struggle more often to overcome soft institutional failures. Further, it can be concluded from this analysis that such initiatives also face capabilities failures and have not invested in external networking activities.

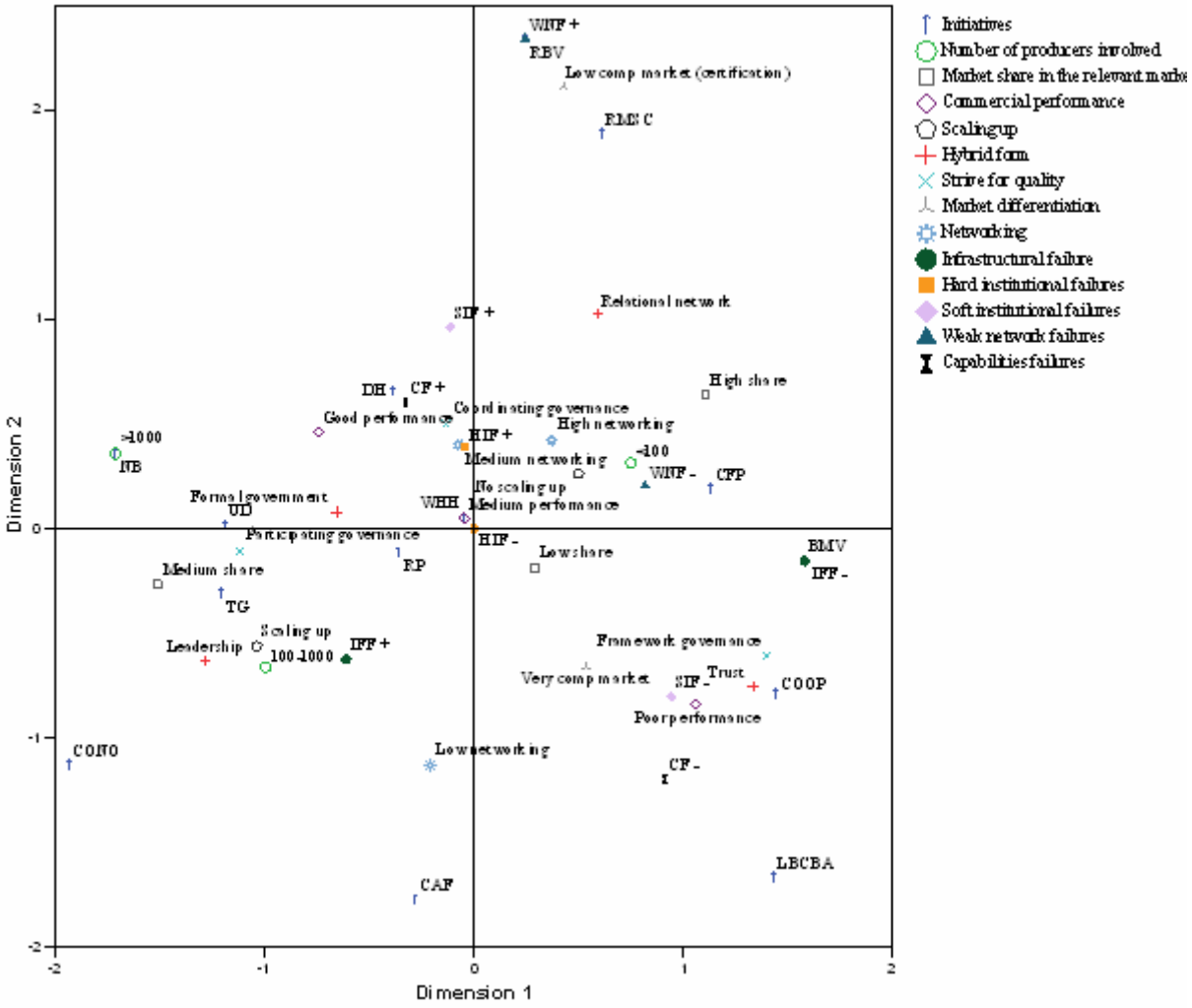

Figure 3. Output of the homogeneity analysis that links performance with internal organisation and external networking

On the other hand, good performance is associated with stronger internal structures (coordinating governance), a medium degree of networking, but also hard institutional and capabilities' failures that have been overcome. There is thus an indication that good economic performance is related to a more formal degree of collaboration and the ability to overcome system failures through interaction with external organisations.

The presence or not of a scaling up attempt is indicated by dotted line in the graph and learns that scaling up is done by initiatives with a medium market share, a participating internal governance structure, organisational forms characterised by leadership, medium sized initiatives (100 to 1000 producers involved) and after having solved existing infrastructural failures.. The presence of the hybrid forms leadership and formal government and the strive for quality through participating governance in this cluster suggests that scaling an initiative up requires a further specification of the collaboration and a more centralized decision structure. These tighter forms of organisation together with a significant number of farmers involved or benefiting from the initiative are also logic in a perspective of the investments required for the scaling up and to overcome the infrastructural failures.

The absence of scaling up, on the contrary, is characterised by small initiatives (less then 100 producers), a high networking profile, an important share in the relevant market and weak network failures that are still present. It could be expected that scaling up is not relevant for initiatives that already have an important market share and that have problems of internal organisation of the network.

6. Conclusion

In this paper, we have analysed the internal organisation and external networking of alternative food chains through the lens of the theory of hybrid organisations and the SI policy approach. Based on these theories, we have identified a set of variables that characterise the performance of AFSCs, their internal organisation and their external networking. Data on 14 initiatives studied within the SUS-CHAIN project were then used to perform a homogeneity analysis. The results learn that there is indeed a relationship between the performance, internal organisation and external networking. Because of the low number of cases, these results are only indicative and need to be further confirmed by other case studies. But in any case they confirm our hypothesis that for successful initiatives both a good internal organisation as a strong external network to overcome system failures are important. We therefore think that our lens to look at emerging food chains is promising and can help to learn why initiatives are able to survive, grow or even to scale-up. .

7. References

Arrow, K. (1974). The Limits of Organisation. New York: W. W. Norton & Cie.

Brunori, G., & Wiskerke, J.S.C. (2004). Marketing sustainable agriculture: an analysis of the potential role of new food supply chains in sustainable rural development. Case study methodology - workpackage 4. Working document. 29 p.

Coase, R.H. (1937). The nature of the firm. Economica, 4, 386-405.

Green, K., & Foster, C. (2005). Give peas a chance: transformations in food consumptioin and production systems. Technological forecasting and social change, 72, 663-679.

Henson, S., & Reardon, T. (2005). Private agri-food standards: implications for food policy and the agri-food system. Food policy, 30, 241-253.

Hubbard, M. (1997). The 'New Institutional economics' in agricultural development: insights and challenges. Journal of Agricultural Economics, 48(2), 239-249.

Ilbery, B., & Kneafsey, M. (2000). Producer constructions of quality in regional speciality food production: a case study from south west England. Journal of Rural Studies, 16, 217-230.

Jahn, G., Peter, S., & Knickel, K. (2006). Comperative case study analysis. SUS-CHAIN WP 6. 100 p. www.sus-chain.org

Klein Woolthuis, R., Lankhuizen, M., & Gilsing, V. (2005). A system failure framework for innovation policy design. Technovation, 25, 609-619.

Marsden, T., Banks, J., & Bristow, G. (2000). Food supply chain approaches: exploring their role in rural development. Sociologia ruralis, 40(4), 424-438.

McFetridge, D.G. (1994). The economics of vertical integration. Canadian Journal of Agricultural Economics, 42, 525-531.

Ménard, C. (2004). The economics of hybrid organizations. Journal of Institutional and Theoretical Economics, 160(3).

Ménard, C. (forthcoming). Oliver Williamson and the economics of hybrid organizations. In M. Augier, J. March, & D. Teece (Eds.), xxx. Oxford: Oxford University Press.

Ménard, C., & Valceschini, E. (2005). New institutions for governing the agri-food industry. European Review of Agricultural Economics, 32(3), 421-440.

Raynaud, E., Sauvée, L., & Valceschini, E. (2002). In Governance of the agri-food chains as a vector of credibility for quality signalization in Europe. Paper presented at the 10th EAAE Congress: Exploring diversity in the European agri-food system, Zaragoza, Spain.

Réviron, S., Vuylsteke, A., & Van Huylenbroeck, G. (forthcoming). Hybrid firms ans decision power distribution within sustainable food supply chain initiatives. In J.S.C. Wiskerke, G. Van Huylenbroeck, & J. Kirwan (Eds.), Sustaining food supply chains: grounded perspectives on the dynamics and impact of new modes of food provision. Aldershot: Ashgate.

Rotmans, J., Kemp, R., & van Asselt, M. (2001). More evolution than revolution. Transition management in public policy. Foresight, 3(1), 1-17.

SPSS. (1999). SPSS Categories 10.0. Chicago: SPSS Inc.

van der Ploeg, J.D., Renting, H., Brunori, G., Knickel, K., Mannion, J., Marsden, T., et al. (2000). Rural development: from practices and policies towards theory. Sociologia ruralis, 40(4), 392-408.

Verhaegen, I., & Van Huylenbroeck, G. (2002). Hybrid governance structures for quality farm products: a transaction cost perspective. Aachen: Shaker Verlag.

Vuylsteke, A., Collet, E., Van Huylenbroeck, G., & Mormont, M. (2003). Exclusion of farmers as a consequence of quality certification and standardisation. Cahiers Options Méditerranéennes : Food Quality Products in the Advent of the 21st Century: Production, Demand and Public Policy, 64, 291-306.

Vuylsteke, A., & Van Huylenbroeck, G. (2005). In A. Blogowski, L. Lagrange, & E. Valceschini (Eds.), Policy actions to support system innovation: the case of alternative food supply chains. Paper presented at the Colloque SFER. Au nom de la qualité: quelle(s) qualité(s) demain pour quelle(s) demande(s), Clermont-Ferrand.

Vuylsteke, A., & Van Huylenbroeck, G. (forthcoming). System failures and the targeting of support to innovative food supply chains. In J.S.C. Wiskerke, G. Van Huylenbroeck, & J. Kirwan (Eds.), Sustaining food supply chains: grounded perspectives on the dynamics and impact of new modes of food provision. Aldershot: Ashgate.

Williamson, O.E. (1985). The Economic Institutions of Capitalism: Firms, Markets and Relational Contracting. New York: Free Press.

Williamson, O.E. (1991). Comparative economic organization: the analysis of discrete structural alternatives. Administrative Science Quarterly, 36, 269-296.