



# Change agents and sustainable supply chain collaboration: A longitudinal study in the Dutch pig farming sector from a sensemaking perspective



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## ARTICLE INFO

### Article history:

Received 1 March 2016

Received in revised form

6 July 2017

Accepted 9 August 2017

Available online 10 August 2017

Handling Editor: Govindan Kannan

### Keywords:

Sustainability

Sensemaking

Supply chain

Change agent

Collaboration

Longitudinal

## ABSTRACT

Academic research on sustainability issues in supply chain collaboration has recently begun to focus more on a network-oriented view. Both horizontal and vertical relationships are being explored, which has led to recognition of the significance of the active participation of change agents in this process. This paper provides a practical example of how change agents shifted an entire chain (pig farming) towards sustainability over 17 years. The longitudinal study examined the mechanics of how change agents in a chain successfully engage others on sustainability issues. A sensemaking approach was used that focussed on three aspects: communication, action, and building relationships. The findings show that the change agents worked on different levels of supply chain collaboration in response to the evolution of the sustainability initiative. Their focus moved from producers controlling the entire chain to engaging in partnerships with other contributors both inside and outside the chain. They translated the abstract concept of sustainability into language understandable for the potential partners, fostering transparency, joined an eco-label certification program, and later invested in experiments to find solutions to new ideas as they arose through reflection. This stepwise construction of a network reveals the evolution of reciprocal interdependence in an informal, personal and trust-based way between organizations which can be applied to sustainability initiatives in other fields.

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## 1. Introduction

Supply chain collaboration on sustainability issues has gained momentum, not only in everyday corporate practice but also in the supply chain management literature and the business ethics literature (Quarshie et al., 2016). In the past two decades, the focus of academic research in these fields has gradually converged from either environmental topics and performance outcomes or ethical concerns and policies to greater appreciation for a network-oriented view. This view focuses attention on the horizontal collaborative ties between suppliers and associated vertical alliances between suppliers and buyers. It also recognizes the active participation of key actors or “change agents” in engaging others to collaborate across the supply chain (Hagedoorn, 2006;

Lazzarini et al., 2008; Prima Dania et al., 2016; Quarshie et al., 2016).

However, despite the convergence on the need for collaborative strategies and the leadership role of change agents, gaps remain in our understanding of how chain relationships evolve into partnerships that embed sustainability issues (Meulensteen et al., 2016; Quarshie et al., 2016). Knowledge of the coordinating interactions through which such change agents translate sustainability concepts into supply chain collaboration is limited (Nassimbeni, 2004). Therefore, authors are calling for more research on long-term collaborative efforts to reach sustainability objectives (Bansal et al., 2014; Seuring and Gold, 2013; Winter and Knemeyer, 2013). Ashby et al. (2012) also emphasized that research which offers real-life insights and guidance into how collaboration on sustainability can be achieved is scarce and should be a key priority.

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We are particularly lacking qualitative research to better understand the actual efforts that are needed to collaborate and build trust with suppliers and communities. These interactions are seldom viewed through a supply chain lens (Quarshie et al., 2016). Insight into chain collaboration increases our understanding of how to involve people across and beyond the chain. This is relevant for change agents who need to gain support from the main chain actors by “getting everyone to understand the key issues and embrace the new vision” (Quarshie et al., 2016).

Finding ways to involve people across the chain is particularly connected to sustainability issues, which permeate all levels of the chain and often are not fully defined, but “are continually (re) constructed as events and issues emerge and are articulated by resourceful actors and stakeholders” (Selsky and Parker, 2010). These emergent issues require parties to negotiate, align values and build trust to achieve agreement on environmental, social and financial responsibility (Clegg et al., 2007; Ring et al., 1994; Sharma, 2000). These exploratory and often intuitive processes are easily impeded by the lack of a common cultural setting in the supply chain. Therefore, the interactions to engage others are critical mechanisms to ensure coordination and create shared meaning (Hult and Slater, 2004).

In view of the above problem definition, the purpose of this paper is twofold. The first purpose is empirical, to identify collaborative patterns of interactions that change agents deploy over time. We also assess how a better understanding of these patterns of interactions can help improve the management of supply chain initiatives. The second purpose is to generate theoretical insights into the long-term construction of collaboration that contribute to the network-oriented view on supply chain collaboration. We draw on a 17-year longitudinal study that followed the efforts of two change agents who initiated the first Dutch sustainable pig-farming chain. They have engaged others to collaborate on sustainability issues throughout the entire period under study. Accordingly, this paper provides new insights and suggests patterns of action involving long-term engagement interactions to manage collaboration for more sustainable supply chains.

In this paper, we adopt a sensemaking perspective to clarify the interactions to collaborate on sustainability issues. This perspective is based on the theory of organizational sensemaking by Weick (2001, 1995, 1979) and others who have built on his work. Utilizing the lens of sensemaking seems a promising approach as it provides a more robust conceptual basis to study the interactions to engage others and to create shared meaning than simply analyzing the change agent's efforts as a series of actions over a period of time (Basu and Palazzo, 2008).

In the next section, we introduce theoretical notions from organizational sensemaking within the context of change agent roles in a sustainable supply chain. Subsequently, we extend this line of reasoning by developing a sensemaking perspective focused on three key concepts: communicating, acting and building relationships. Then we explain the qualitative research methods. This is followed by the presentation of our longitudinal empirical fieldwork from the sensemaking perspective. The paper concludes by discussing the contributions and future research directions of this study.

## 2. Change agents and sustainable supply chain collaboration

This paper builds on the network-oriented view in the supply chain literature that recognizes the engaging, meaning-making role of change agents in collaboration on sustainability issues (e.g.

Quarshie et al., 2016; Visser and Crane, 2010; Vlachos et al., 2013). The change agent is defined as a supply chain member who is “seeking to drive or subvert a change agenda” (Buchanan and Badham, 2008) toward sustainability and whose role is formally appointed or, in this case, self-appointed.

The unit of analysis in this paper is the change agent as an individual and not in the shape of the organization as a whole, as in chain research on the greening of industrial development. Research in a food supply chain by Andersson and Sweet (2002), for example, referred to collaborative guidance by “a firm that takes on the role of change agent”. Rossi et al. (2000) defined multinational corporations, governments and civil society as “leading agents of change” and “critical institutional change agents in sustainability”. In this field, inter-organizational collaboration became a dominant theme in the 1990s (Rossi et al., 2000; Sarkis et al., 2015). The focal point of efforts to reduce environmental impact changed from organizational processes to the relations between organizations (Boons and Baas, 1997). Research addressed the “strengths and limitations of partnerships between government, business and NGOs” (Rossi et al., 2000) and “solutions using an interactivity based process of social networking” (Partidario and Vergragt, 2002).

The individual as change agent is a more common unit of analysis in fields that focus on social partnerships and intra-organizational sustainability processes. Some social partnership studies mention the involvement of powerful actors that “seek to manage the meaning of partnership” (Selsky and Parker, 2010) or “bridging agency as a collective process” (Manning and Roessler, 2014) in sustainability processes. Intra-organizational research more elaborately examines individual change agents in sustainability processes. This body of literature regards change agents as key interpreters in a search process of how organizations configure sustainability in relation to their organizational context (Metcalf and Benn, 2013; Rauter et al., 2017). These intra-organizational studies acknowledge that change agents gradually translate general information on sustainability into diverse organizational settings, practices and routines (Aguilera et al., 2007; Cramer et al., 2006; Haack et al., 2012; Onkila and Siltaoja, 2015).

Change agents in the supply chain are similarly involved in a process of searching for interpretations of what sustainability means in actual practice. However, in the supply chain context, the change agent is confronted with two main circumstances that differ from the setting of the individual organization. Firstly, given the lack of a shared culture in the chain, collaboration often needs more negotiation and coordination, “eventually enabling participants in inter-organizational relationships to achieve more congruent understandings” (Vlaar et al., 2006). Secondly, the supply chain has no overarching top management that validates the change agent role in collaboration. This is contrary to the situation of the change agent within an organization who, ideally, is supported by the CEO or top management and engages others on centrally determined priorities of sustainability issues (Basu and Palazzo, 2008; van der Heijden et al., 2012).

In this paper, we posit that in chain collaboration for sustainable development, members struggle to understand each other. Problems of understanding emanate from the fact that chain partners are interdependent, but their interdependencies are often asymmetric. They are accustomed to different cultures, which include dissimilar structures, ways of working, organizational resources, knowledge and terminologies (Vlaar et al., 2006). Therefore, chain partners acting as change agents should take time to “discuss and develop a shared understanding of sustainable development” (Sharma and Kearins, 2011).

In this paper we build on the finding from intra-organizational studies which demonstrates that change agents take part in an unfolding and emerging process shaped by trial and error. The messy reality of the problems of practice demands that they navigate between chain parties, using negotiated and politicized forms of interaction. They have to make things happen with dynamic uses of language, thoughts and activities (Cramer et al., 2004). It follows then that their interactions cannot be analyzed as a process that is coordinated by autonomous individuals who act on rational calculations (Tatli and Özbilgin, 2009).

By taking the above aspects of prior knowledge into account, this paper intends to improve the empirical grounding for action patterns that capture the reality of how change agents in the chain understand what they are about, how they act, adapt and relate with others, and how these processes evolve over time (Bartunek et al., 2011; Tatli and Özbilgin, 2009). We adopt a sensemaking perspective to follow the long-term development of a sustainable supply chain initiative in the Dutch pig-farming sector, from the standpoint of the change agent. Such a sensemaking view focuses attention on how the change agents have engaged others to develop working relationships, and constructed and shared meanings of sustainability with people in and around the chain.

### 3. Sensemaking perspective

The mediating role of change agents in chain collaboration is reflected in visible interactions as well as less visible “backstage tactics” (Buchanan and Badham, 2008) of negotiating and creating support with different interest groups (Tatli and Özbilgin, 2009). Building on knowledge from intra-organizational contexts, recent studies have shown that taking a sensemaking perspective on sustainability processes brings observable interactions as well as the underlying negotiations to the fore (Haack et al., 2012; Lockett et al., 2006; van der Heijden et al., 2012; Visser and Crane, 2010). In a similar way, Sonenshein (2016) demonstrated that a focus on how central actors make sense can offer a way to understand the social processes shaping a firm's attention toward new or unknown sustainability issues.

The theory on sensemaking in organizations was originally developed by Weick (1979, 1995; 2001) and has become highly influential in the field of organization studies, especially in organizational process research (Anderson, 2006; Brown et al., 2015; Sandberg and Tsoukas, 2015). Sensemaking in and between organizations is a social process of how people make and share meaning of new or unknown organizational issues: “sensemaking is an ongoing process of meaning construction whereby people interpret events and issues within and outside of their organizations that are somehow surprising, complex, or confusing to them” (Cornelissen, 2012).

Thus far, taking a sensemaking perspective has not been common in supply chain and other inter-organizational research (Jørgensen et al., 2012; Vlaar et al., 2006). Vlaar et al. (2006) state that conventional perspectives on inter-organizational collaboration prevail in the literature, and their paper is one of the first to propose a sensemaking perspective to examine collaborative inter-organizational relationships. Their study emphasizes the central role of formal processes of negotiating and contracting as a means to overcome differences in culture, management styles and expertise, “eventually enabling participants in inter-organizational relationships to achieve more congruent understandings”. However, research on embedding sustainability within organizations found that informal bargaining interactions

(aiming to create support) are at least as important as formalization (Van Der Heijden et al., 2010). Arguably, formal and informal collaborative interactions, and possible tensions between them, can assume a relevant role in supply chain collaborations.

More recently, Sharma and Kearins (2011) furthered Vlaar's sensemaking approach of inter-organizational collaboration to focus more specifically on how individuals make sense of sustainability. Based on Weick's sensemaking theory, they assert that “the human relational aspects of collaborative organizing are very central to the institutionalization of sustainable development”. They also contend that, in practice, inter-organizational collaboration for sustainability entails complex and difficult processes of engagement. They conclude that the idea that collaboration is an effective mechanism to achieve sustainability is idealistic “and perhaps overly simplistic”. Their study shows that adopting an interpretive view based on sensemaking “sheds light on the fluid and ‘human’ nature of inter-organizational collaborations for sustainability”. Also, in line with our argument above on problems of understanding, a sensemaking-based view explains how asymmetries between partners can influence the emergence and development of collaborations that benefit sustainability (Sharma and Kearins, 2011).

In sum, the literature increasingly acknowledges that a sensemaking lens can bring to the fore less tangible process elements of formal and informal interactions, tensions that stem from knowledge and expertise asymmetries, and collaborative mechanisms and motivations. These elements, however, are generally not addressed in studies of real-life supply-chain practice. As a matter of fact, an often-heard critique on organizational sensemaking as a research perspective is that “the notion of process remains relatively vague” and “lacks details about the actual process of sensemaking” (Sandberg and Tsoukas, 2015).

Therefore, in this paper, we apply a sensemaking perspective that builds on our prior research (Van Der Heijden et al., 2010, 2012), which operationalized theory by considering three sensemaking concepts. These concepts include different types of engagement interactions by change agents: (a) discursively constructing accounts (‘communicating’), (b) undertaking tentative action (‘acting’) and (c) connecting to others (‘building relationships’). We will discuss these three concepts and adapt them for use in empirical analysis in the supply chain context, based on the theoretical vantage points of the research above.

#### 3.1. Communicating

Weick's sensemaking work centers on language and communication in the construction of organizational reality (Eisenberg, 2006). Authors who build on that idea focus on discursive aspects of sensemaking, such as language, discourse, communication, dialogue, and vocabularies (e.g. Balogun et al., 2014; Calton and Payne, 2003; Gephart, 2004; Hill and Levenhagen, 1995; Schultz et al., 2013; Taylor and Robichaud, 2004). In the supply chain context, creating a form of common vocabulary can enhance understanding of other partners' efforts, develop “positive collaborative spirit around sustainability” (Sharma and Kearins, 2011), and thus help to overcome asymmetries in knowledge between partners.

According to Weick and Quinn (1999) change agents can be effective prime movers for whom language interventions become a crucial means to create change. Studying how they talk and use words can help to clarify the multi-dimensional functions of communication (Strannegård, 1998).

Supply chain collaboration also requires the exchange of

information between stakeholders and therefore the need to share a language and manage information flows on sustainability issues (Hofstede, 2003). Vice versa, an increased focus on how change agents communicate sustainability issues could improve our understanding of supply chain information flows (Quarshie et al., 2016).

In the case study of this paper, we analyzed how the change agents formulated the issues of sustainability in the pig-farming supply chain over time. The main argument, from our sense-making perspective, is that the interactions to develop a 'local' language on sustainability facilitated the collaboration between partners. This is because when a general idea of sustainability is translated to the local context, it can evolve into a specialized local language—a jargon (based on Daft and Wiginton, 1979). We therefore determined whether the change agents were using a local language and how they used it to engage others over time.

### 3.2. Acting

Sensemaking is a cyclical process of taking action in order to translate events and develop shared understanding (Daft and Weick, 1984; Weick, 2001). A change agent is a sensemaker whose ways of acting, observations and reflections contribute to a shared understanding (Craig-Lees, 2001; Seligman, 2006). To become aware of such interactive, emergent ways of acting, we need to look at what the change agents do to create interpretations of the situations they deal with. In essence, interpretation follows on from the expectations created. By sharing expectations on sustainability issues, change agents can help develop collaborative relationships as well as a better understanding of the sustainability issues in the chain. Sharma and Kearins (2011) argue that such expectations need to be realistic about what can be achieved through collaboration.

In the case study, we examined the expectations that the change agents attached to sustainability issues and how they made use of those expectations, i.e. which interactions sprang from the expectations. We also determined some of their observations and reflections on the realization of their expectations and actions, and consequently revealed changes in ways of acting over time.

### 3.3. Building relationships

Inter-organizational collaboration for sustainability is not just about relations in the chain. It is also about building relationships with authorities (government and local), NGOs and other stakeholders. The concept of building relationships, however, is not highlighted in sensemaking theory as explicitly as communicating and acting. We argue that the notions of sensemaking and building relationships are inextricably related, for two reasons. Firstly, new and thus uncertain ways of working often cause actors to struggle with changing organizational relationships (Luscher and Lewis, 2008). Secondly, the issue of sustainability in particular involves connecting people in all activities, departments, and organizations in the chain and in the network around the chain. Weick (1995, 2001) argues that informal and formal ways of connecting are central to shared sensemaking. Such processes of organizational sharing are built through patterns of communication interlocking with actions (Bakken and Hernes, 2006; Langley and Tsoukas, 2010).

As mentioned above, Vlaar et al. (2006) are one of the few to concentrate on 'formalization' - i.e. formal processes of negotiating and contracting - as a means to interpret inter-

organizational collaboration. Our prior intra-organizational research showed that informal interactions also contribute to a more consensual view of sustainability (van der Heijden et al., 2012). Combining both types of interactions, Clarke and Roome (1999) suggest that collaboration for sustainability in an inter-organizational network occurs simultaneously informally through personal contacts and formally through official partnerships and strategic plans.

In order to examine how change agents build relationships in the case study, we studied two types of interactions that can create shared meanings: informally connecting people through personal contacts, and handling formalized connections such as rules, contracts and authority relations. We identified informal and formal change agent approaches and determined whether these ways of working changed over time.

## 4. Research context and methods

### 4.1. Research context

The agri-food sector is being pressured to become involved in the embedding of sustainability, as food production typically has significant economic, social and environmental impacts on a local and regional level. The suppliers, processing companies, and groups or cooperatives of farmers often need to work together under close scrutiny from local governments and societal organizations. The literature on sustainable supply chains in the agri-food sector has increasingly focused on the collaborative horizontal and vertical alliances (Oerlemans and Assouline, 2004; Smit et al., 2006). These studies often address the construction of regional agri-food systems (Berti and Mulligan, 2016; Marsden and Smith, 2005).

Especially in such pressured chain settings, the lack of a shared culture makes it difficult to translate information about sustainability issues into collaboration. Hence, the translator role of change agents in mobilizing others into the networks of suppliers and buyers can manifest clearly in a chain initiative within that sector (Berti and Mulligan, 2016; Marsden and Smith, 2005; Oerlemans and Assouline, 2004; Smit et al., 2006). The selected case of the pig-farming initiative illustrates this change agent role well.

Pig farming is an important economic sector in the Netherlands, with production amounting to almost €3000 million in 2012, which represented 50% of the gross production value in the Dutch livestock sector and 11% of the primary sector. From the 1980s onwards, restrictive policy measures were introduced to reduce the environmental impact. In 1997 the sector stopped expanding, due to internal factors (the outbreak of disease and low prices for pork) and to external pressure relating to animal welfare issues and the high environmental impact of pig farming. Government policy measures also encouraged family companies to scale up. Accordingly, the number of farms decreased from 15,000 in 1999 to 5110 in 2014, while the average number of pigs per farm increased from 900 to 2400.

In response to the problematic situation in his sector, a pig farmer named Hans Verhoeven started a beyond-compliance sustainable supply-chain initiative. The initiative, named "De Hoeve", started in 1999 and is still functioning in 2017. It was the first sustainable pig-farming initiative in the Netherlands. This case offers rich and illuminative insights about the phenomenon of engagement by change agents because sustainability is a salient issue in the sector, and the initiative is a long-running and

notable example of sustainability process development. The noteworthiness of the initiative became apparent when the authors of this paper participated in a research project that was based on the situation of the pig-farming initiative in 2006. At the time, the two change agents had undertaken several steps to address sustainability issues in their supply chain. Although these steps were not always successful, they appeared motivated to continue their attempts. Overall, the collected data showed that the initiator Hans Verhoeven, who was joined at a later stage by agro-advisor Mark van den Eijnden, operated as internal change agents who are “involved in facilitating, initiating, influencing, and implementing change” (Buchanan and Badham, 2008).

Because the two change agents had participated several times in research projects for sustainable farming, they were used to exchanging information with researchers and open to the idea. Thus, the case and its two actors as change agents were selected for their knowledge, their noteworthy long-term involvement, and their willingness to participate. This approach to the selection of the case and the actors relates to interpretive research design, which privileges case selection based on access to persons and documents and focuses on local, situated knowledge to improve understanding of the phenomenon under study (Bartunek et al., 2011; Schwartz-Sea and Yanow, n.d.). This is in line with the aim of this study to better understand the interpretive process of how interactions of language, action and relationships influence the course of the sustainability process.

In order to identify the evolution and patterns of interactions during the process of achieving sustainability, we used longitudinal process research methods that focussed on the history of the case and on constructing timelines to demonstrate and explain how the interactions unfold (e.g. Pettigrew, 1990; Van de Ven et al., 2000; Westnes, 2007). The value of the longitudinal research was twofold. First, it yielded rich information with a high level of detail that allowed us to narratively construct the process and made it possible to identify and sequence social

interactions that the change agents connected to moments of change (based on Abbott, 1992; Van de Ven et al., 2000; Westnes, 2007). Such rich, long-term accounts revealed changes that could not have been found in a short-term study (Symon and Clegg, 2005). Second, the longitudinal study and the use of related sensemaking concepts allowed for more sensitivity to the process and enabled us to trace emerging process patterns (Christensen et al., 2013).

## 4.2. Methods

### 4.2.1. Data collection

This study takes a processual approach, using a qualitative single-case study design to capture the longitudinal evolution from the standpoint of the internal change agent(s) (Pettigrew, 1990; Yin, 2003). A triangulated methodology was used to collect different types of data and validation through feedback verification from participants and outsider researchers (Boeije, 2010; Shenton, 2004). In longitudinal studies, observation and verification are iterative processes (Pettigrew, 1990), which in this study involved open, structured, in-depth group interviews with the change agents and participants in the chain, individual interviews, participant observation, documentary data, account verification and external verification (see Table 1). Between the sessions of data collection, the researchers maintained contact with the change agents and other participants, which established and sustained their trust and hence made them willing to provide extensive information. Another contributing factor to the reliability and accuracy of the data is the fact that the change agents did not request anonymity.

The primary data were collected through retrospective collective and individual interviewing (Langley and Tsoukas, 2010), in which the focus was on letting the participants reconstruct the evolution of the process they followed. Since retrospective accounts are susceptible to limitations of memory and rationalization (Langley and Tsoukas, 2010), we used reflective and

**Table 1**  
Stages of data collection.

Methods	2006 Participants/source	2013 Participants/source	2015 and 2016 Participants/source
Open-structured, in-depth group interview with hot seating (3 h per session)	<ul style="list-style-type: none"> <li>•Initiator-pig farmer (change agent)</li> <li>•Coordinating manager (change agent)</li> <li>•4 pig farmers (interview guide: Appendix A)</li> </ul>	<ul style="list-style-type: none"> <li>•Initiator-farmer (change agent)</li> <li>•Coordinating manager (change agent)</li> </ul>	
Semi-structured, individual interviews (1 h per interview)	<ul style="list-style-type: none"> <li>•6 pig farmers who participated in an introductory programme for the initiative (none of them joined the initiative) (interview guide: Appendix B)</li> </ul>	<ul style="list-style-type: none"> <li>•2 chain partners (abattoir owner and wholesaler)</li> </ul>	<ul style="list-style-type: none"> <li>•Coordinating manager (change agent) (2015 and 2016)</li> <li>•2 chain partners (abattoir owner and wholesaler) (2015)</li> <li>•Round-table meeting (2015)</li> <li>•Academic meeting of change agents and chain partners with the Dutch scientific network “The Green Mind”, focused on a recent sustainability issues initiative (2016)</li> </ul>
Participant observation (3 h per session)			<ul style="list-style-type: none"> <li>•Interviewees (2015, 2016)</li> <li>•Sustainability professor who participated in the “The Green Mind” scientific network meeting</li> </ul>
Account verification	<ul style="list-style-type: none"> <li>•Interviewees</li> </ul>	<ul style="list-style-type: none"> <li>•Interviewees</li> </ul>	
External verification	<ul style="list-style-type: none"> <li>•Reports of previous public-private research projects in which the initiator had participated</li> <li>•Published articles and interviews about the initiative (in farming magazines and on the internet)</li> <li>•External researcher who had been intermittently involved in scientific projects with the pig-farming initiative since 1999</li> </ul>	<ul style="list-style-type: none"> <li>•Published articles and interviews about the initiative (on paper and on the internet)</li> <li>•The same external researcher who had been involved in scientific projects with the farming initiative</li> </ul>	

group discussion methods of data collection. The main example of reflective methods is the group interview in 2006, which was divided in two parts. The participants were change agent Hans Verhoeven, assistant Mark van den Eijnden, and four pig farmers from the initiative. The aim was to collect data on the initiative's background and the formation process from 1999 until 2006, as well as the state of affairs in 2006 (the interview guide is attached as [Appendix A](#)).

In the first part of the session, the approach was based on the active 'hot seating' method to encourage discussion and share information among the participants. The hot seating method is derived from research on drama teaching ([Heathcote and Bolton, 1995](#); [Machado et al., 2001](#)). The method was used to let the participants reflect on their expectations and the actions and outcomes of their efforts. It put the participants in a situation that would enable them to explain their interpretation of their ways of interacting. We facilitated the session and asked several questions about the participant's role in the initiative. Each participant first wrote down a few cues. Next, every participant was 'hot-seated' for 7 min and asked to explain his role in the initiative, guided by the questions. Subsequently, the rest of the group was primed to ask questions to the hot-seated participant. We prepared follow-up questions as well, about the reasons and added value of participating and the cooperation in the group. During the second part of the group session, we elicited a concluding discussion between the participants about (a) their motivations, themes and modus operandi, (b) the strengths, weaknesses and binding factors of the group, and (c) their expectations about the future of the initiative.

For triangulation via data sources ([Shenton, 2004](#)), we conducted semi-structured individual interviews with six pig farmers who participated in an introductory program that was organized by Verhoeven. These six farmers did not join the initiative. Another data source for triangulation was a comparison between interview data and document analysis (i.e. reports of previous projects, published articles and interviews in farming magazines and on the internet). The follow-up sessions, in 2013 and 2015–2016, comprised updated process reconstructions. The interviews were based on a customized guide that set out the aims of the conversation. The interview topics were the participants' motivations and expectations, ways of working and joint actions. Other topics were the notions of sustainability that were introduced, the people and organizations that were involved in the initiative, and the interventions they developed.

In 2015 a round table meeting with six participants from the initiative (the two change agents, the two chain partners and two farmers) aimed to incorporate the most recent process developments. They each presented their views on how the initiative came about historically and which future developments they envisaged. In 2016 an update of the process developments was obtained during an interview session and participant observation. The observation, by one of the authors, took place during a meeting between the sustainable pig-farming initiative and the Dutch scientific network "The Green Mind". The Green Mind is a nationwide network of prominent scientists from universities and colleges that collaborates with companies to develop sustainable business models. The farming initiative was represented by the change agents, the chain partners from the abattoir and wholesaler, and two farmers. The change agents had asked the scientists to discuss with them their two sustainability priorities at that time (on more sustainable fodder and a closed

**Table 2**  
Stages of data analysis.

Data analysis	Output
1. Temporal <b>chronology</b>	Narrative (thick description)
2. Interaction <b>clustering</b> and contexts	Key events that define actors, ways of doing, process shifts ( <a href="#">Appendix C</a> )
3. Identification of repetitive temporal <b>patterns</b> ( <a href="#">Langley and Tsoukas, 2010</a> )	Overall temporal process pattern of four critical sensemaking periods ( <a href="#">Fig. 1</a> )
4. Longitudinal <b>tracking</b> in the sensemaking concepts	Detailed account of main engagement interactions per time period ( <a href="#">Appendix D</a> )

loop production system) and the possibilities to finance the accompanying innovations. The collected data were externally verified by one of the sustainability professors who participated in the meeting.

All interviews were taped and transcribed verbatim, and the participants verified the transcriptions of their interviews.

#### 4.2.2. Data analysis

The data analysis comprised four steps (see [Table 2](#)). First, we wrote a chronology in the form of a case history, pulling together the interview accounts and documentary data ([Lincoln and Guba, 1985](#); [Pettigrew, 1990](#)). It started as a narrative of the change agent interventions, including activities, intentions, typical and recurring quotes, and contextual situations and circumstances. We then focused on further shaping the case history, in order to reach a more fine-grained understanding of the timeline of change agent interactions for a sustainable business model ([Fairhurst, 2004](#); [Glick et al., 1990](#)). Therefore, as a second step we clustered the change agent interactions and their contexts into key events as defined by the central actors, their ways of doing, and shifts in their process. [Appendix C](#) shows a section of the coding into event clusters.

As a third step, we combined the empirical findings of the clustered key events with the chart of the fluctuations in the initiative's growth (see [Fig. 1](#)) and identified four time periods in the development of the sustainable farming initiative ([Langley and Tsoukas, 2010](#); [McPhee, 1990](#); [Ven and Poole, 2005](#)): setting up, stagnation, revitalization, and consolidation. They served as a division for the data analysis and presentation of our research in the Findings section of this paper.

As the fourth and final step of data analysis, we applied the three sensemaking concepts of "communicating", "acting", and "building relationships" to each of the four growth periods. The sensemaking concepts provided a basis for the empirical analysis of our findings, as the "underlying logic" that enabled us to understand why that succession of events would take place (based on [Langley and Tsoukas, 2010](#)). [Appendix D](#) gives a detailed account of the results of this analysis in the form of social interactions as observed through the lens of the three sensemaking concepts. The quotes from the interviewees are translated from Dutch, to give readers an impression of the significance of tone and tenor during the embedding process and the character of process evolution (based on [Haack et al., 2012](#)). These detailed results are indispensable to this paper because they are part of the thick description of the findings that enables the reader to assess how well the presented knowledge and perceptions may be applicable to other settings ([Langley et al., 2013](#); [Lincoln and Guba, 1985](#); [Schwartz-Sea and Yanow, n.d.](#)).

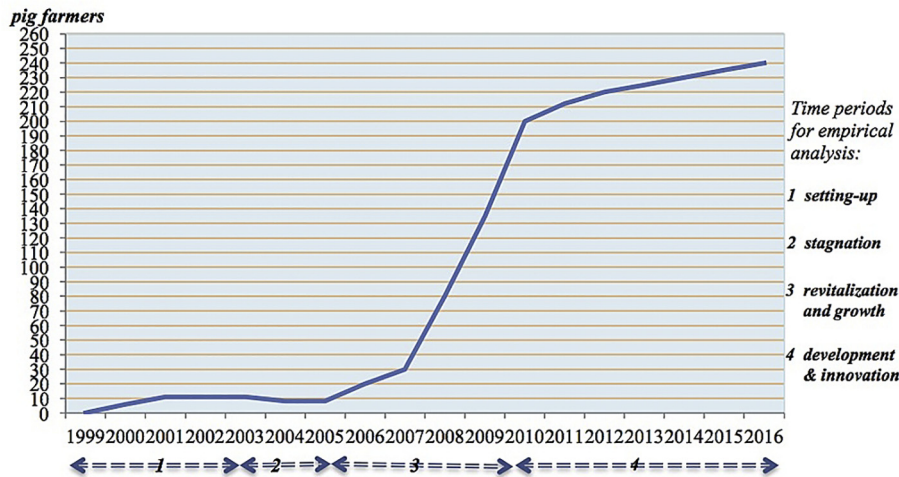


Fig. 1. Growth fluctuation and four time periods: number of pig farmers in the sustainability initiative.

Table 3

Changing foci, time and core aims to achieve overarching local sustainability ambition.

Focus	Time period	Core aim
Producer level collaboration	Setting up 1999–2003	Take control of chain processes from producer level
Producer level collaboration	Stagnation 2004–2005	Expand chain control from producer level
Chain level collaboration	Revitalization and growth 2006–2009	Enlarge playing field via chain partnerships
Beyond the chain level collaboration	Development and innovation 2010–2016	Remain front-runner via far-reaching partnerships

## 5. Findings

As discussed in the Methods section, Appendix D gives a detailed account of the findings and their contexts of time and place, subdivided into the four time periods. This section first summarizes the findings about the change agents' overarching sustainability ambition and their changing levels of supply chain collaboration to achieve that ambition. This is followed by patterns of interactions that are linked to the changing level of collaboration. These interactions reveal the experiences of the change agents as they are unraveled using the three concepts of the sensemaking lens: communicating, acting and building relationships.

### 5.1. Overarching ambition and changing level of collaboration

The findings show that during the 17-year process, the change agents adhered to achieving one overarching, locally defined sustainability ambition. They consistently pursued the ambition to ensure the continuation of a family business through more environmentally friendly chain processes and better animal welfare practices that create financial and societal value.

Over time, however, the level of collaboration to achieve that ambition changed. Three different levels of collaboration emerged from the findings: the producer level, chain level and beyond the chain level. Table 3 presents an overview of these changing foci on collaborative levels.

The table also shows how the change of collaborative level related to the time periods analyzed and which core aims were pursued to achieve the overarching sustainability ambition. Initially, the focus was on collaboration among the producers. The farmers aimed to take over the chain processes that used to be beyond their control (time periods 1999–2003 and 2004–2005). Hence, the change agents built a network with other farmers, at the producer level of the chain. In 2005, however, it became apparent that the focus on chain control had stagnated. Subsequently, the initiative was revitalized after sessions of reflection on the course of events. The focus changed from producers controlling the whole chain to close collaboration with partners throughout the chain. Finally, from 2010 and again after reflection, the change agents shifted their attention to engaging in far-reaching partnerships outside the chain. Since then, the core aim has become to remain front-runner on sustainability.

Distinguishing the different foci is important because they appeared to link with different interaction patterns to achieve collaboration. These patterns are further explained below in the next section.

### 5.2. Patterns of interactions at three collaborative levels

The agents regularly reflected on the course of their initiative and adapted their collaborative interactions accordingly. Hence, during the sustainability process, each focus is related to a pattern of interactions to engage partners at the producer level (pattern 1), chain level (pattern 2), and beyond the chain level (pattern 3).

The following descriptions of the interaction patterns typically show types of interactions that recur at each level of collaboration and other types of interactions that are new and relate to the collaborative focus in question. The patterns of reiterative and new interactions at different collaborative levels are summarized in Fig. 2.

#### 5.2.1. Interaction pattern 1: producer level collaboration

The change agent's **communicative** interactions show that the sustainability focus was on engaging others within the producer level of the chain. The change agent's persuasiveness manifested in the informal ways he shaped and used a locally adapted sustainability language. Alongside the contextualized overarching sustainability ambition, he conveyed the expected financial and

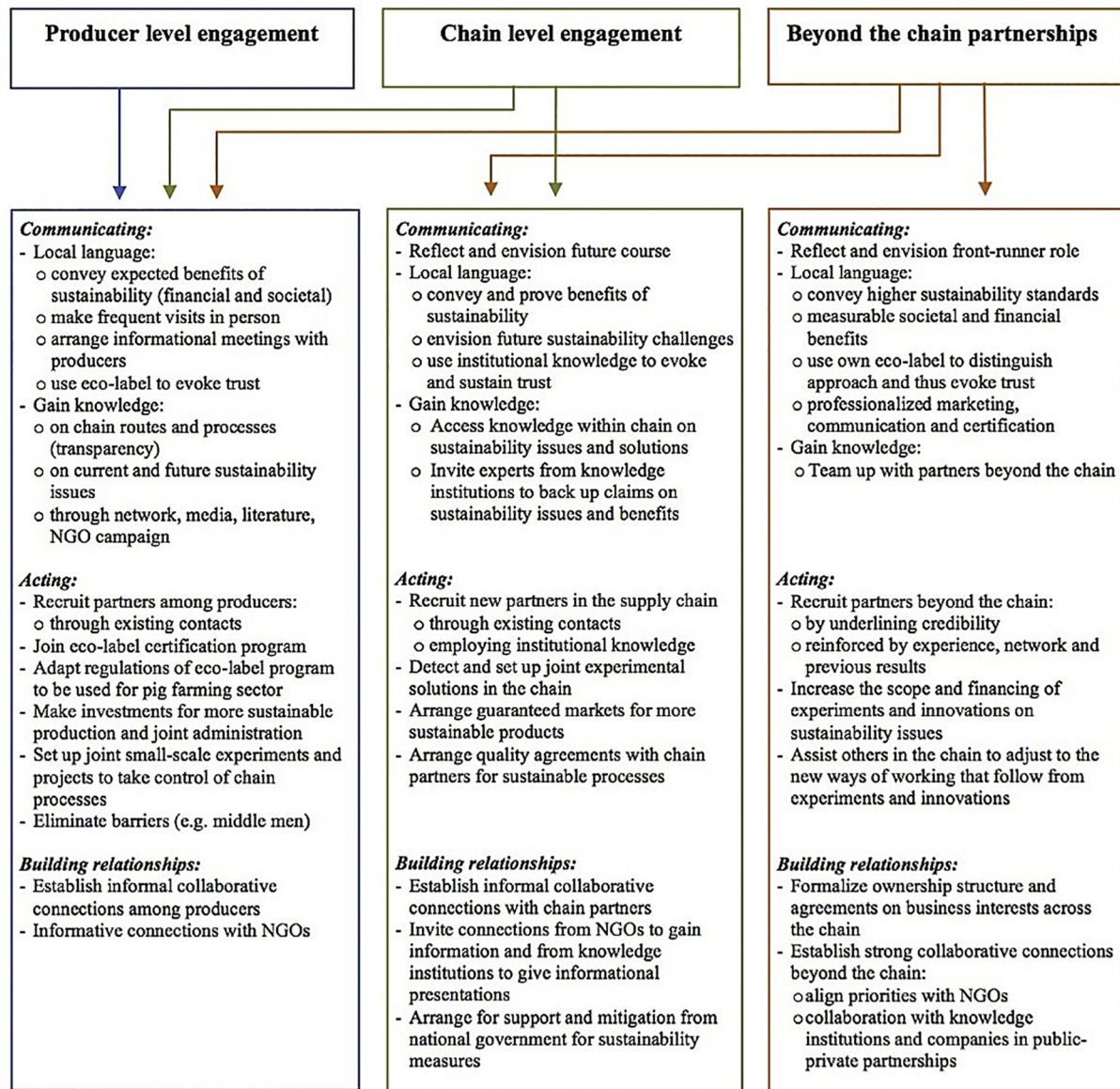


Fig. 2. Three levels of collaboration and corresponding interaction patterns.

societal benefits of that sustainability ambition to the farmers. He also organized information meetings and discussions among the farmers, and frequently conducted personal visits to the farms of potential partners.

The group actively sought to take control of chain processes. Therefore, the change agent wanted to gain knowledge of the sustainability issues in the sector. He kept himself informed through his network, the media and the professional literature, and translated the ideas into language tailored to the perception of the producers.

The change agent realized that the producers needed to gain insight into the routes of their products financing and power relations throughout the supply chain. These chain routes were traditionally screened by middlemen, who decided on what to buy, from whom, when, and for how much. The change agent severed that connection with middlemen and broke down other barriers in

the chain as well by making the chain processes more transparent. This enabled the participants to take more control over quality, delivery times, and market price fluctuations. They used their increased control of chain processes to execute interventions that improved animal welfare and enabled more environmentally friendly production methods.

These interventions reflect one of three ways of **acting** by the change agent to set up and organize the single chain level. First, emphasizing the expected financial and societal benefits, the change agent recruited pig farmers who were willing to take an active role in the supply chain processes. He drew on his existing network of contacts to approach potentially interested producers. By 2001 a total of 11 farmers were participating in the network.

Second, the pig-farming initiative joined the Dutch eco-label certification program called Milieukeur. The eco-label program



was used in other sectors but not yet in pig farming. The producers and the certification agency together set the criteria for sustainable pig farming. The change agent suspected that this approach would 'offer a guarantee as well as tracking and tracing and thus serve as a carrier of our message'. Additionally, the eco-label evoked credibility and trustworthiness for the sustainability initiative.

Third, following on from the certification criteria and the improved chain transparency, new investments were made for more sustainable operational management, production and administration. The eco-label program also became a platform to share ideas and set up experiments and small projects to change the chain routes and processes. Solutions were mainly discovered through trial and error.

Collaborative **relationships** were primarily established among the producers. These were informal collaborations based on mutual trust. Ideas and shared meanings were developed during meetings about the sustainability activities and ways to collaborate. The strength of the relationship among the producers was demonstrated in 2003 when the participating farmers received lower prices than their competitors, but stayed part of the initiative.

The change agent also initiated discussions about sustainability issues in his network and gained information from NGOs campaigning on pig-farming issues. It is noteworthy that the interaction with NGOs can precede the connections with supply chain partners.

The above course of social interactions contributed to the formation of a small but stable alliance of pig farmers. They were bound together by their shared expectations that achieving a more sustainable chain collaboration would increase the financial and societal value of their production processes and thus ensure the continuation of their family business.

From 2004, however, the tide turned and the sustainable farming initiative had begun to stagnate. Unforeseen leadership and capacity problems, combined with a large financial risk, brought about different ways of communicating, acting and building relationships.

The main reason for the setback was the diverted attention of the change agent who had taken up an external administrative post at the national agricultural federation. Due to his absence, the social interactions became more distant, more formal and less frequent, which was not in keeping with the informal and persistent approach that had attracted the initial group. Additionally, financial and organizational issues led to a further stagnation of the energetic setting-up interactions. The survival of the sustainable pig-farming model hung in the balance. The change agent was faced with the choice of either abandoning the initiative or redirecting all his attention to reviving the idea of creating a new and sustainable business model for pig farming.

Despite the stagnation of the initiative, the change agent had built up knowledge and a network of new contacts both home and abroad during his absence. This network would prove helpful to revitalize the initiative.

### 5.2.2. Interaction pattern 2: chain level engagement

In 2006, forced by the problematic situation of the sustainable farming initiative, the change agent reconsidered the future of the initiative and his involvement. Applying the sensemaking lens, the findings focusing on ways of **communicating** reveal his interactions of reflection and persuasion. The change agent sat down with his assistant to reflect on the course of the initiative. They decided to give up the external administrative post and jointly

revitalize the initiative. Their main intervention was to let go of the idea of taking control of the chain processes. Instead, their attention shifted from collaboration on the producer level to forming partnerships at other supply chain levels. The reason for this change of approach was that the change agent anticipated financial guarantees and organizational assistance from an expansion of the collaboration. A restart was thus set in motion, this time with the former assistant taking up the role of an additional change agent.

The chain partners needed to be willing to align their values and ways of working, and commit financially to the network. Therefore, to convince them to participate, the change agents continued to use their familiar personal interactions of communication. In addition, the local language was adjusted for the different parties along the chain.

The change agents also employed institutional knowledge to back up the claimed benefits. Experts from national knowledge institutions functioned as an external, objective information source during meetings with prospective chain partners. They explained future sustainability trends and ways to act on them, which reinforced the credibility of and trust in the sustainability initiative.

In their ways of **acting**, the change agents used their familiar approach of mobilizing their contacts to recruit chain partners. Only after engaging chain partners did the agents discover that the new level of collaboration enabled them to develop more substantial interventions on sustainability issues. The new focus on collaboration appeared to offer more advantages than the expected financial and organizational assistance. The collaboration quickly grew stronger as it contributed to more sustainable production and chain processes. The chain partners took financial risks and guaranteed markets for the more sustainable products, which in turn convinced farmers to collaborate. The change agents also arranged quality and production agreements in the chain on sustainable products.

But the most important consequence of the chain collaboration, according to the change agents, was that joining forces enabled them to detect and set up extensive experimental solutions for sustainability issues. The turning point for the sustainability initiative was the radical and risky reform towards a production process that led to measurable societal and financial benefits. This reform was the action to bring uncastrated pigs (boars) to the market. This was a bold choice as it anticipated societal acceptance from consumers and competitors in the sector but also from the NGOs that had started the societal discussion on piglet castration and animal welfare. The change agents knew their proposal had far-reaching implications. They also knew it was feasible because the director of the abattoir had found a technical solution that did away with the need for castration. It was up to the change agents to convince all parties to become the first supply chain to implement this modification. The chain partners took the financial risk of the project and arranged for a guaranteed boar meat market. Moreover, uncastrated pigs were generating more revenue because they are heavier set and previously could not be sold.

Eventually, the radical production reform made the economic benefits of sustainability tangible, which resulted in a substantial increase in the number of participants in the sustainability initiative. Following this increase, the change agents could demand certain volumes of produce and allowed for a stricter selection of partners.

To realize this sustainability reform, the change agents had to develop interactions to deal with the farmers and chain partners,

and arrange for external support. They took advantage of their network that had grown considerably during the absence of the initial change agent, due to the international and diplomatic nature of his external work. They used that built network of **relationships** to create support and guide this (and other) reforms in the envisioned direction. For example, they utilized their contacts with national government officials to mitigate possible adverse publicity from competitors.

From the viewpoint of building relationships, the findings again show the added value of reflection. Taking time to reflect and envision future challenges proved to be a major element of how the change agents identified new sustainability issues and devised alternative plans with added societal values and financial benefits. Overall, the initiative achieved a larger playing field.

### 5.2.3. Interaction pattern 3: beyond the chain partnerships

The findings on interactions of **communicating** showed that in 2010 the change agents again reflected on their approach to achieving the overarching sustainability ambition, mainly because other sustainability initiatives in the sector were catching up. Given their aim to remain a front-runner on sustainability, they decided to distinguish their approach from the upcoming initiatives by starting their own, autonomously developed eco-label.

The change agents remained as focused on fine-tuning the local language as ever. They emphasized the higher sustainability standards of the new eco-label, and its measurable societal and financial benefits. Moreover, they professionalized the marketing, communication and certification procedures. Along with these formalizations of the local language, the familiar informal and personal meetings and visits remained important ways of informing and engaging partners of the growing initiative.

The new aim to remain a front-runner on sustainability also led to several ways of gaining knowledge of locally adapted sustainability solutions. The change agents teamed up with public, societal and private parties beyond the chain in partnership collaborations.

**Acting** on the new approach, the change agents also increased the scope and funding plans of their sustainability experiments and innovations. They had gradually surpassed the standards of their initial eco-label and could better foresee future sustainability issues. To realize the expansion, the agents reached out to collaborative partners outside the chain. In group and personal meetings, they built on their credibility gained from experience and the results of their previous sustainability interventions. The approach of trust-based collaborations beyond the chain also became evident in experimental projects, for instance on the public health issue of antibiotic use in pig farming. In that project, the initiative engaged in a public-private partnership to test and implement new measures. As a result, they could stop the administration of antibiotics. As follow-up interactions, they demanded of the participants the implementation of the resulting new measure in all production processes, and they assisted them to effectuate the necessary adjustments.

These ways of acting were also applied to sustainability innovations, and increasingly, the interactions of acting and **building relationships** intertwined. A recent example is the project to install a closed-loop system of manure digesters on all farms. In 2016 the change agents had mobilized the national knowledge network 'the Green Mind' to present their efforts and questions, and managed to find investors and new collaborative partners for their innovation. Overall, collaborations with partners beyond the chain were

extended from merely informative to coordinative, as for instance with NGOs who aligned their priorities during private meetings with the sustainability initiative.

Formalization of the relationships was achieved in an advanced stage of the collaboration. In practice, the beyond the chain collaborations were also informal, and based on trust and transparency. The change agents claimed that robust relationships generally originate from connections with people having similar values and world views, and sharing the same ambitions on sustainability. They also expressed that their early start in the 1990s made them feel as if they were "playing chess on five boards simultaneously" and the long-term involvement "provided the knowledge and experience which now gives us an advantage".

## 6. Discussion

This paper highlights the importance of social interactions by change agents to engage others in supply chain collaboration on sustainability issues. We have argued that a longitudinal empirical analysis guided by a lens of three sensemaking concepts can reveal patterns of collaborative interactions. A better understanding of these interaction patterns can help improve the management of sustainable supply chain initiatives. We also intended to gain theoretical insights into the construction of collaboration to contribute to the network-oriented supply chain literature.

### 6.1. Empirical contribution

The main empirical insights hold implications for practice, through the added value of the exemplary action courses and the elucidation of the interpretive change agent role.

Firstly, practical guidance in sustainable supply chain studies generally addresses collaboration as planned change processes and focuses on developing step-by-step plans, models, indicators or tools (e.g. Carter and Jennings, 2002; Courville, 2003; Cramer, 2008; Cruz, 2008). This paper, however, identifies three exemplary patterns of interaction that move beyond planned implementation guidelines and focus on the collaborative interactions of change agents in inter-organizational contexts (Fig. 2). The interaction patterns show how new and recurring social interactions set events in motion and develop over time (based on Ven and Poole, 2005; Westnes, 2007).

More specifically, the collaborative patterns of interaction highlight how change agents convince other parties to collaborate on sustainability issues. It is worth recommending these patterns to other initiatives as they show how the close collaboration within the chain enabled access to more knowledge and experience of chain processes and solutions for sustainability processes. They can inspire practitioners to deal with emergent, meaning-making aspects of negotiation, coordination and trust-building across the chain, to complement the planned models. In that sense, the study shows that making a conscious effort to determine context- and situation-related engagement approaches is a tool to facilitate the long-term embedding of sustainability.

Secondly, this study elucidates the largely neglected interpretive role of the internal change agent, who appears to play a central role in encouraging chain collaboration on sustainability issues. The empirical analysis showed that over time, the new and repetitive social interactions by change agents evolved into collaborative and knowledge-based relationships. The change

agents had to deal with changing situational contexts (such as social and political awareness of sustainability) and personal contexts (such as opinions and relational networks). Therefore, the involvement of chain partners and other stakeholders in sustainability issues is not a standard procedure of well-defined steps. The experiences of the change agents showed that, to a large extent, it is an intuitive process that involves central actors who rely on their social, political, and organizational sense to guide them in adapting to new circumstances. Furthermore, experimenting through trial and error was essential to reveal opportunities for sustainable growth.

Thirdly, the longitudinal research setting revealed that the change agents gradually gained skills, knowledge and network partners, which contributed to their increasing ability to assess opportunities to expand the initiative. They also took advantage of the credibility they acquired through previously obtained results. Hence, the change agents who always try to find sustainability opportunities and search for leeway for change adhere to the role that Wilson and Barbat (2015) identified as the “political entrepreneur”, who is concerned with “the creation of inter-organizational value and the management of power”. In the farming case, the change agents are entrepreneurs who continuously search for ways to enhance the embedding of sustainability by enlarging their circle of partners and the scope of the initiative. Not knowing in advance which strategy will be most effective, they learn through trial and error and by building relationships within and around the chain. They precede and even augment the formal collaborative mechanisms of contracts, processes and structures that supply chain managers normally take into account (Wilson and Barbat, 2015).

The indispensability of the entrepreneurial change agent role was shown when his involvement was interrupted by other commitments outside the sustainability initiative. In the absence of the change agent, the chain partners lost focus and became less aware of collaboration. In essence, the change agent has an important role in engaging others because he acquires and exchanges tacit knowledge on sustainability. This knowledge is typically provided and transferred through personal interaction, by example or experience, both inside and outside an organization. These interactions of networking in sustainable supply chain contexts are “an important element of the knowledge flows within these networks that lead to innovation” (Boons and Berends, 2001). This study demonstrates how networks built by change agents are important in processes of sustainability and innovation.

## 6.2. Theoretical contribution

This paper makes three contributions to the literature on the network-oriented view of supply chain collaboration. First, it positions the stepwise construction of the farming case as a netchain transformation. Second, it illustrates new elements of participant interdependence. Third, it demonstrates the useful added value of a sensemaking lens in detecting social interactions that encourage collaboration.

To start with, the analysis of the interpretive, entrepreneurial role of change agents shows the steps of transformation that can be achieved over time. The farming initiative provides new insights into the necessary preceding steps at lower integration levels within and around the supply chain towards transformation at the chain and system level. These preceding steps are often neglected in the literature on the supply chain level and in transition

management (e.g. Blome et al., 2014; Haan and Rotmans, 2011).

This emergent side of sustainable supply chain collaboration revealed a gradual, tentative and stepwise construction. In that sense, the long-term development can be considered a netchain transformation. The term ‘netchain’ is used in the chain literature to represent a larger interfirm network that incorporates not only supply chain aspects such as technology and logistics but also a social structure and collective responsibility that is shared by the participants (Hofstede, 2003; Lazzarini et al., 2008). The concept of netchain entails both horizontal and vertical chain alliances, which are “the processes that take place between the members, the processes of engaging other actors and the processes of engaging in relationships with the ‘outside’ world” (Oerlemans and Assouline, 2004). The farming initiative illustrates the netchain’s emphasis on transparency, trust and informal relationships.

Second, this paper adds to the knowledge of types of interdependence between participants in a netchain. Lazzarini et al. (2001) call this type of interdependence “reciprocal interdependence”. In other words, the participants are mutually dependent, and “the knowledge of one party strongly depends on the knowledge of another”, which means there is “knowledge co-specialization”. The reciprocal interdependence in the farming initiative is a collaboration based on strong social ties and dense networks and personal coordination mechanisms.

What is needed in the literature is an analysis of the evolution of reciprocal interdependence in netchains (Bommel, 2011; Lazzarini et al., 2001). This is important for a more advanced understanding of complex inter-organizational relations. The longitudinal case setting of the sustainability netchain in pig farming provided an opportunity to reconstruct how these dependencies are negotiated over time. The practice of the farming initiative demonstrated how collaboration can remain informal, personal and trust-based, even between organizations and even when financial interests and organizational ties increasingly intertwine.

The third and final theoretical insight follows from the sensemaking lens used in this paper. The sensemaking viewpoint revealed the largely overlooked importance of reflection for the continuation and deepening of sustainability processes. Reflection in sensemaking theory is more than evaluation; it means “critically examining and reconstructing meaning” (Kessener and Termeer, 2007). Reflective pauses make room to define problems, which requires a different method of reasoning than solving problems (Bakken and Hernes, 2006; Kessener and Termeer, 2007). For that reason, reflection is an occasion for new sensemaking.

The change agents of the farming initiative regularly reflected on their course and adjusted their expectations, focus, scope, and actions to the changing circumstances and demands. In that sense, they were able to translate general notions about sustainability into a language and plan of action that were locally understood and embraced.

Furthermore, the reflective pauses manifest as important occasions for new sensemaking, eliciting “mindful acts” (Weick, 2006; Weick and Sutcliffe, 2001) to achieve contextual (localized) meanings of sustainability. Weick proposed the idea of mindful acts to further his ideas on shared perceptions and actions (Weick, 2006; Weick and Sutcliffe, 2001). The concept was developed from Weick’s earlier work on the role of expectations that guide interpretations. Basically, when people are mindful, “they continually review and refine expectations in relation to events and context” (Bakken and Hernes, 2006).

The change agents' reflective pauses focused on the expectations that they had tied to the ambitions of the sustainable business model. Reflection led them to change focus on how to achieve the sustainability ambition and interpret the expected outcomes in terms that fitted the local context, i.e. a local language. Based on the longitudinal process findings, we assert that the mechanism of regular reflection resulting in adaptive foci and action courses gives concrete expression to Weick's concept of mindful acts. Thus, meaning-making occasions are not isolated moments but connected steps that deepen and strengthen inter-organizational collaboration over time.

Are the findings summarized above specific for sustainability initiatives or do they hold for all more radical transformation processes? Relying upon Langley et al. (2013), we assume that the findings may be valid for other transformation processes as well. The results apply particularly to processes that involve similar actor-based, problem-oriented approaches that start by questioning what the problems and solutions are and aim to develop sustainability visions and possible courses of action (Avelino, 2011).

The findings of this paper apply to embedding processes with similar dimensions of balancing ethical values and trust-based collaboration across organizational and societal levels. The ways in which the change agents of the farming initiative acquired knowledge typically manifest a transdisciplinary approach in which social interactions with other partners led to the accumulation and refinement of knowledge, including the involvement of actors from outside academia in order to integrate the best available knowledge, reconcile values and preferences, and take responsibility for problems and solutions. In that sense, the meaning of a transdisciplinary concept such as sustainability for a particular supply chain (here pig farming) is not straightforward from the beginning but is defined through the social interactions of the change agents with partners and refined in the course of time.

## 7. Conclusions

This paper highlights how embedding sustainability is a social process of translating the abstract concept into meaning that is relevant to the day-to-day work of individuals. The change agents are central actors who pull together and push ahead amid an ongoing and emergent sustainability process. They contextualize sustainability issues into a local overarching ambition. The ambition expresses the societal added value and ensuing financial benefits. Over time, the change agents adapt their approach to take account of envisioned trends in the sector and in society. Sensitive to context, they use informal interactions and personal contacts to fine-tune the sustainability foci, expectations and interactions. As a result, a progressively congruent and local embedding of sustainability is achieved through building connections with others.

The longitudinal study has offered the opportunity to examine the mechanics of how change agents in a chain successfully engage others on sustainability issues. The general lessons deduced from it made it possible to identify patterns of action that enable change agents to reach sustainability objectives. Those courses demonstrate exemplary ways to mobilize collective action and adaptively build integrative relationships "that are characterized by shared employees and activities" (Pelozo, 2009).

The sensemaking lens of three analytical concepts helped to

unravel patterns of social interactions to gradually achieve local interpretations of sustainability. It highlights how sustainability issues are localized and how change agents "interpret their environment in and through interactions with others, constructing accounts that allow them to comprehend the world and act collectively" (Maitlis, 2005). Although sustainability endeavors are linked to local contexts, the case study demonstrates the widely applicable lesson that achieving the embedding of sustainability is a dynamic, adaptive, and innovative process that attains different levels of shared meaning over time, both across the chain and beyond to the network around the chain. The sustainability focus and overarching local ambition motivate people to respond to new issues and therefore are strongly related to the local embedding of sustainability practices (cf. Bansal, 2005; Bansal et al., 2014). The sensemaking lens illustrates how sustainability becomes embedded not as a result of a systematic stepwise approach but by skillfully and adaptively navigating social interactions.

Following on from this, an important direction for future research would be to further investigate sustainability embedding as an ongoing process of sensemaking. Such research should focus on multiple case comparisons of sustainability processes in intra-organizational and inter-organizational settings. Furthermore, in order to better understand and address sustainability embedding, it could be a valuable addition to multi-system perspectives of sustainability management to pay attention to social processes (e.g. Lozano, 2012; Starik and Kanashiro, 2015). Subsequently, the idea of embedding as an ongoing process of sensemaking could also be applied to methodologies for studying processes, with retrospective understanding of how processes operate being translated into insights and tools to help companies make plans for future interventions (i.e. prospective sensemaking).

## Acknowledgements

We would like to thank the interviewees who participated in this study for the wealth of information they freely provided. We are also grateful to the editor and the anonymous reviewers, and to Paul Spee, Frank Boons, Wouter Spekkink, Julia Wittmayer and Lenie Klein Holkenborg for their helpful feedback and suggestions. Finally, we would like to thank Alison Fisher for professional editorial and linguistic assistance.

## Appendix A

### Interview guide De Hoeve/Milieukeur

*Group discussion 1: members of the Milieukeur producer association 27 May 2006, 19:00–22:00*

*Background.* The following parties will participate in the group discussion: the organiser (pig farmer), his assistant (Agro-advisor) and pig farmers who are currently members of the Milieukeur producer association and sustainability initiative De Hoeve BV.

We want to learn about how the participants coped with the transition from standard to sustainable pig farming: what were (and are) their motives and expectations about participation, how did they handle and arrange the transition?

In the discussion, both the individual and the collective processes were covered. Initially, a development will have taken place in the way they individually regard their working method and its

context. At the same time, the pig farmers are jointly forming a producer association, in which ideas, values and practices are developed, likewise through mutual interaction. These processes occur at the level of the company and of the horizontal and vertical chain network.

During the group discussion, the manner of interaction and the roles of the different parties were considered in the process of establishing the producer association.

#### *Group discussion, approach and supervision*

##### *A. Introduction*

1. Background of the study
2. Aims of the group discussion:
  - a) Insight into the motivation, working method and collaboration of the Milieukeur pig farmers.
  - b) Improvement of the introductory programme for interested pig farmers, based on these insights.
3. Next steps after group discussion:
  - Report sent to all participants for comments
  - Comments processed in an analysis and sent to all participants
  - Recommendations for improved design of the introductory programme
4. Practical matters:
  - The discussion will be recorded, and the recording treated confidentially
  - The outcomes of the discussion will be published. Data about the organization will only be made public after obtaining consent.
  - Informal form of address.

##### *B. The process of creating support: 2 HOURS and a short break*

Using the “hot seat” method: in 5 min each participant answers verbally several concrete questions he received in advance. Then the other participants can ask questions for 5–10 min. This leads quickly to an image of the process that each company went through and the influential motives and factors.

The questions are:

1. Why was joining this producer association important for you?
2. What expectations did you have about your participation in this group?
3. Which steps have you taken so far?

Follow-up questions, for example:

- Why did you choose this particular group, Milieukeur/De Hoeve, what attracted you to it?
- To what extent have your expectations about this initiative been realized?
- What is for you the added value of participation in this producer association? (financial, environmental, individual & social, etc.)
- In what way(s) and in what situations have you had contact with the other pig farmers and with De Hoeve BV?

##### *C. Strategy (in cooperation with national agricultural economics research institute): 30 MINUTES*

**Aim:** obtaining an image of the differences and similarities in the companies' strategies.

#### **Questions:**

1. Which strategy have you followed so far to strengthen your business position (growth, cost reduction, specialization, added value, social acceptance, collaboration with fellow producers, collaboration in the chain, etc).
2. Can you assess the external environment and the market: will the demand for your product increase or decrease?
3. When reviewing your company's environment (in spatial as well as marketing and policy terms), what do you consider the greatest opportunity or threat regarding further strengthening of this sustainability initiative?
4. What do you think are the strong and weak aspects of this sustainability initiative?

**Approach:** Have the participants first write down key words for themselves and then initiate the discussion for each question.

##### *D. Conclusions (EUR): 30 MINUTES*

1. Determine which motives, themes and working methods are brought up and discussed.

#### **Checklist for drawing conclusions:**

##### *Motives*

- Which motives are involved when deciding to switch (or not) to Milieukeur?
- Are economic arguments important to convince pig farmers to join Milieukeur?
- Do the motives of ‘early adopters’ differ compared to pig farmers who join Milieukeur at a later stage?

##### *Themes and working methods*

- How did the collaboration between the Milieukeur companies come about over the course of time and which factors were involved?
  - What did the current pig farmers originally expect to achieve by participating in Milieukeur and to what extent have they been successful; what were the hindrances and the success factors?
2. What binds the current group of pig farmers who are participating in Milieukeur:
    - What are the strong and weak points?
    - Do they share certain value-oriented principles?
  3. Is there currently a common idea regarding the future development of Milieukeur pig farming?

#### **Appendix B**

##### *Selection procedure and interview guide De Hoeve/Milieukeur*

##### *Interviews with sustainable pig farming initiative, November 2006* *Background*

1. The following pig farmers participated in the introductory programmes of De Hoeve-Milieukeur (**bold** text = selected for interview):

Participated in introductory programme:		Oct2004	1Nov2004	15Nov2004	28Feb2005	Test deliveries
1	V.d. Aalst				X	
2	Corsmit		X			
3	Van Deurzen			X		
4	<b>Van Gompel</b>				<b>X</b>	
5	Gosens			X		
6	<b>Hesselmans</b>			<b>X</b>		<b>YES</b>
7	Van Hoof				X	
8	Horevoorts			X		
9	De Jong	X				YES
10	Joosten			X		
11	Koppens		X			
12	Krol			X		
13	Van Laarhoven			X		
14	Van Leeuwen-1		X			
15	<b>Van Leeuwen-2</b>			<b>X</b>		
16	<b>Maas &amp; Haassen</b>		<b>X</b>			
17	V.d. Meerakker		X			
18	Megens	X				
19	V.d. Nieuwelaar		X			
20	<b>Moonen</b>			<b>X</b>		<b>YES</b>
21	Van Nostrum		X			
22	Van Oosterhout	X				YES
23	Peeters		X			YES
24	Poels-V.D. Wiel			X		
25	Raaijmakers				X	
26	Rijkers*	X				
27	Smit				X	
28	Verbruggen			X		
29	<b>Vermeer</b>			<b>X</b>		
30	V.d. Vleuten		X			
31	V. Wijk-Bruurs	X				
32	V.d. Zanden		X			

## 2. This selection was based on the following criteria:

- Distribution over the introductory programmes; the vast majority followed the programme from 15 November 2004. The first programme (start-up) was not included. There was also variation in price comparison and test shipments or not. The suitability of the pigs arose as an important factor frequently addressed in the discussions between De Hoeve and the pig farmers. Some of the details about the pig farmers will be requested in the discussions, including unknown data.
- For personal reasons, 1 pig farmer (instead of 2) was included from the group from 1 November 2004.
- If necessary, two extra interviews can be planned: with a representative from 28 February 2005 and an additional pig farmer from the group that did not participate (but did register).

individual pig farmer's workplace. To allow sound comparisons, a semi-structured design was used. The aim was to get the pig farmer to tell us details about his background and then his own story.

### Interview guide. A. Introduction

Emphasis on confidentiality, especially: De Hoeve will not have access to data if the pig farmer does not grant consent. The data are analyzed anonymously. Consent requested to record questions.

Clarification given about what the data will be used for and how feedback will be given.

### B. Profile

1. You attended the introductory meeting about Milieukeur/De Hoeve on [date]; how many meetings of this programme have you attended in all?

	Gompel	Hesselmans	Leeuwen	Maas	Moonen	Vermeer
Introductory programme on:	28-2-05	15-11-04	15-11-04	1-11-04	15-11-04	15-11-04
Price comparison done:	Yes	No	No	No	Yes	No
Test shipments done:	No	Yes	No	No	Yes	No
Suitability of pigs:	Possibly	Still unclear	No info	Not now	Yes	No info

## 3. Type of interviews:

It was decided to conduct one-to-one interviews at the

2. How long have you been a pig farmer? Do you run the company on your own or with others/family members?

Can be added at the end of the discussion, if not already covered:

1. Is it correct that subsequently a price comparison was/was not done, concerning delivery via De Hoeve compared to your current situation?
2. What do you think of the price-setting for the pigs via Milieukeur?
3. Is it correct that you did/did not conduct any test shipments?

### C. Initial contact

1. Had you heard about De Hoeve and/or Milieukeur before being invited for an introductory meeting about Milieukeur pig farming? *If yes*, how did you become acquainted with it and in what year did that take place?
2. And did you know beforehand any pig farmers who had participated in De Hoeve/Milieukeur?
3. What aroused your interest to find out more about it? *In-depth question*: What were the most important reasons for you to learn more about this producer association?

### D. Motivation

1. Why were you interested in *this* initiative in particular; what appealed to you? – *We summarise the ideas about this in a list on paper*
2. I shall name two characteristics of the working method used by De Hoeve/Milieukeur. Please specify *whether* you feel these characteristics are important for such an initiative:
  - a. Mutual contact and discussion between the participating pig farmers and De Hoeve
  - b. Active role for the pig farmer in the process to slaughterhouse and wholesaler (from the yard to the platform; this changes the role of the dealer) – *We summarise these characteristics briefly on paper*
3. Seeing these different characteristics or motives listed: can you specify which ones you consider to be most important by arranging them in order of importance?
  - If possible, continue asking in-depth questions about trust and the way trust develops. For example: why do you find personal contact important?

E. The introductory programme.  
*You followed the introductory programme,*

1. Why do you think you were invited to the introductory meeting(s)?

2. What did you think were the good points of the meeting(s)?
3. What did you feel was missing or was not addressed well?
4. Do you have any more suggestions to improve future introductions about De Hoeve/Milieukeur?

*I would now like to discuss how you regard the initiative of the De Hoeve/Milieukeur producer association:*

### F. Expectations and actions to take

1. What could be the added value for you (financial or otherwise) of participating in this producer association?
2. What were your initial expectations concerning this initiative? (in particular: *when* and *how* did you notice the possibilities of participating yourself in Milieukeur/De Hoeve?)
3. Have you taken action since then to see if the working method of Milieukeur could be suitable for your company, whether or not in collaboration with Alex Bikker and/or Mark van den Eijnden from De Hoeve?
4. You just stated that your expectations regarding Milieukeur pig farming initially concerned [...]. What is your opinion about that now?
5. What do you think are the strong points of the initiative?
6. And what are the weak points?

### G. Conclusions and future perspective conclusion

1. What were the most important reasons for you not to participate (yet) in the De Hoeve/Milieukeur initiative?
2. Are there other factors that influenced your decision? *In-depth question*: What role did the suitability of the pigs play in your decision not to participate (yet)?
3. Do you consider your decision not to participate in De Hoeve/Milieukeur definitive, or will you keep the possibility open? If you would consider participating in the future, what does your decision depend on?
4. Can you indicate what this initiative needs to continue growing, to include more pig farmers in the future?

### Appendix C

Interaction clustering and contexts of key events that define actors, ways of doing, process shifts (section of data sheets)

Development	1998	2003	2006	2007	2012
<b>Event clusters</b>					
<b>Acquire participating pig farmers</b>		<p><u>Change agents set up Milieukeur certification</u> - Vision of change agents: <b>Owning the pig-farming chain</b>; controlling, steering</p> <p>Change agents use <u>existing personal contacts to find participants</u> (trust)</p> <p><u>Fixed amount of 11 farmers; 1000 pigs a week</u> - Farmers are united in producers association</p> <p><u>Introduction program</u> for unknown contacts as possible participants - Expanding not successful - Not enough farmers to meet expectations of growth and surplus value</p> <p><u>Main change agent leaves</u> the organization - Due to taking place in supervising committees, the main change agent has to limit his involvement with De Hoeve.</p> <p><u>Restart after financial difficulties</u> (a.o. with POP-project (see below)) - Change agents return - committed to focus on chain, - <u>vision</u> of change agents: becoming <b>chain manager</b> instead of chain owner - Financial support from bank to make restart</p> <p><u>New participating farmers</u> - Through personal visits of farmers - These farmers are clients of <b>1 and later 6</b> wholesaler's <b>middlemen</b> - however, growth of participating farmers not fast enough (2000)</p>			
pigs/week)					<p><u>Much faster growth</u> of participants, <u>after stopping castration</u> - because more profit and less trouble of castration work</p>
middlemen					<p>Participants through <b>25</b> - 18000 pigs per week - NB farmer dependent on</p>
middleman					<p>2012: Transfer from Milieukeur to <u>own certification scheme Duurzaam.</u></p>
'KDV' (Keten Marktsvies)					
<b>Meetings</b>		<p><u>Personal meetings at each farm</u> to explain and assist participation and certification (trust)</p>		<p><u>Formal and guided meeting with abattoir/wholesaler organization:</u> - Goal: to <u>convince</u> them of incorporating De Hoeve Milieukeur sustainability - Vision of change agents: Market will soon make beyond-compliance demands - Introduction lecture by expert, research-based, about <u>the trends of the future</u> - De Hoeve offers them the Milieukeur concept to incorporate, in order to anticipate on future market developments for sustainability.</p> <p>First meeting with one <b>middleman</b> of the abattoir/wholesaler, in - Change agents explain their approach; middleman wants to test</p> <p>Meetings at farms, connections from <b>middleman</b> middleman and farmers join De Hoeve.</p> <p><u>Informal but guided meeting with farmers</u> - about stopping castration</p>	
approach sustainability					
early					
restaurant					

## Appendix D

Detailed account of main collaborative interactions per time period (1999–2016)

Setting up (1999–2003): Focus: Take control of chain processes from producer level Outcome: horizontal network for sustainable pig farming

**Communicating.** The driver behind the initiative to set up the sustainable farming program, was the farmer Hans Verhoeven. His specific ambition was the creation of a new sustainable business model for pig farming that would generate higher income and thus long-term survival of the family companies. He took the lead as internal change agent for the following reason (group interview in 2005):

“My previous investments in new barns, improved animal welfare, less emissions, and more energy efficiency assure my survival in the short term. But if the market remains anonymous and prices drop, a new approach is needed.”

Essentially, he expected to realize his vision of a new business model by setting up an association of farmers who would join forces to assume control of the pig farming chain.

“My farm is too small to form a substantial group toward consumers. So is my neighbor's farm. Together we give meaning to collaboration”.

The change agent's persuasiveness was manifested in the

informal ways he communicated these expectations to the farmers, in terms that fitted the pig farming context. He made frequent visits in person and addressed informational group meetings to explain the initiative. From 1999 until 2003 this way of communicating convinced 11 farmers to participate. This, for example, is the experience of farmer Van Helvoort:

“We [pig farmers] had a bad [public] image. I went over to listen to the Milieukeur story in the town of Valkenswaard. After that, Hans [Verhoeven] came to my farm to talk about it. That personal approach is the main reason why I joined in”.

Through direct and personalized ways of providing information, Verhoeven's ideas became the expectations of his peer group. Overall, the farmers described their expectations of the initiative as:

- “gaining control of bringing our products to the market”
- “making a tangible profit”
- “maintaining small-scale family companies”
- “breeding pigs in a more environmental-friendly way”

**Acting.** To develop a shared understanding specific actions were taken. First, in operational management, the farmers made new investments for eco-label certification: a change to a new breed of pigs, and a large investment in reducing farm emissions of minerals into the environment. Furthermore, actions were developed in order to take control of deliveries to the abattoir. For example, during group meetings the farmers agreed upon a collective price



setting and payment system that would calculate an average price over every five weeks of delivery. Additionally, in 2001 the change agent and his assistant manager set up a central office to administer both the eco-label certification program and the financial operations.

Second, to organize and manage the group of farmers, change agent Verhoeven focused on recruiting farmers drawing on his existing connections. By 2001 there were 11 farmers in the network.

Farmer Hendriks: “Benny van der Heijden [a farmer] was in my study club and told us about his experiences in the network, about the better price from Milieukeur eco-label. My middleman then offered me a better price as well but I told him that I preferred De Hoeve for being a cooperative which offered surplus value as well as a more purposeful way of farming”.

*Building relationships.* During the setting up of the sustainable pig farming initiative, three sets of connections between people were created: between the farmers, with societal organizations, and with market partners in the supply chain.

The farmers united in De Hoeve developed close professional relationships. The eco-label certification program laid a foundation for discussions on new ways to collaborate. Ideas and shared opinions about activities and ways of collaboration were developed during personal and group meetings. The strength of the relationship was demonstrated in 2003, when the participating farmers received lower prices for their products than their competitors yet remained in the initiative.

Working on the Milieukeur eco-label certification also led to relationships with NGOs and private sector organizations, ranging from green activists to a bank. Agro-industry consultant Van den Eijnden who acted as the assistant of the change agent Verhoeven was surprised about the effects of collaboration with societal organizations. He had not foreseen that, for example, an animal rights foundation would start lobbying with a supermarket chain on behalf of the pig farmers from De Hoeve. However, support from government officials was limited:

Verhoeven: “Civil servants as well as politicians are very interested, but only in private conversations, not in public. (...) The societal basis of our initiative has not yet been translated into better government policies for sustainable farming”.

To assume control of the supply chain the farmers needed to establish other relationships with chain partners. They were ignorant of their products' price setting, logistics and power relations as all handling was taken over by middlemen as soon as the pigs had left the farm. Therefore they mapped out the links of their chain and came up with ideas and interventions:

“We learned that in the regular chain it takes several days for butchers to receive an order. A shorter delivery time would be better for the produce and for the welfare of the animals. We reorganized logistics and could deliver the meat in 24 hours. To make that happen, pigs had to be loaded at night. The farmers conceded to that experiment and wanted to see what that does for our profit margin. Taking that amount of control also enabled us to change to an abattoir that could meet the Milieukeur standard.”

In the same period, one type of existing relationship was terminated: between the farmer and the middleman. Severing the latter connection was a tough and emotional decision. Traditionally, the relationships with middlemen are very important for pig farmers, often dating back one or two generations. Ending the relationship with middlemen enabled the sustainability initiative to assume more control over market prices and collective planning.

*Stagnation (2004–2005): Focus: expand chain control from producer level Outcome: reduced leadership and financial setbacks*

*Communicating.* By 2004 the sustainable farming initiative had begun to downturn. While most farmers valued the initiative as such, it had become increasingly difficult to pinpoint any financial benefits. The farmers' network proved to be too small for interventions that could meet the expectations of its participants. The time of difficulty coincided with a critical turn in the management: change agent Verhoeven reduced his involvement in the initiative. The regional agricultural federation had invited him to join the board. Verhoeven struggled with his loyalties but the chairmanship also was an opportunity to build a professional network:

“The agricultural federation put pressure on me to take on a board position, mainly because of my experience with De Hoeve. It was a difficult decision but it enabled me to scour the world for more knowledge on other sustainability concepts and to meet people”.

Triggered by unfulfilled financial expectations and shifting management attention, the personal communication, meetings and visits largely stopped. The farmers involved in De Hoeve, started complaining among themselves, mostly by email, about the payments and costs of participating in the initiative. As a result, three of the farmers refused to pay for certification and left the group.

*Acting.* A further expression of the period of decline became evident as two main financial setbacks endangered the survival of the sustainable farming initiative. **First**, the financial centralization by taking control of the administration of deliveries and price setting, exceeded the administrative capacities of the people involved. Essentially, constant fluctuation in the market prices for pigs and meat engendered important financial risks and impeded a feasible profit strategy. **Second**, the farmers encountered a financial setback as anticipated income from a public-private partnership project never materialized. The farming initiative drained reserves, and almost caused the group to collapse.

*Building relationships.* Recruiting new participating farmers generated another challenge for the sustainability initiative. While the change agent approach originally was personal, informal, informational and based on existing connections, it changed towards a more formal, distant approach. Contrary to what happened during the set-up of the initiative, prospective participants were invited randomly, without consulting familiar connections. Despite the efforts to involve the new farmers via a formal introduction program, none of them joined De Hoeve. From the research interviews it appeared that the prospective farmers had markedly different expectations. They had appreciated the idea of personal contact and collaboration with other farmers, but they did not support the more active role they would have to take in the delivery

of the pigs and other animal welfare and environmental investments. Their main interest was in the added financial value, which had not yet materialized.

*Revitalization and growth (2006–2009): Focus: chain partnerships Outcome: collaborative, experimental solutions for sustainability issues*

*Communicating.* Confronted with the possibility of the imminent collapse of his pig farming initiative, farmer Hans Verhoeven reconsidered his involvement. In 2006 he sat down with his assistant Mark van den Eijnden. He reported: “We looked at each other and said, ‘we either stop with the whole thing or we go full speed ahead. We decided the latter’. Verhoeven gave up the board membership and other commitments and started with van den Eijnden to revitalize the sustainable pig farming business model. From then on, Verhoeven and Van den Eijnden jointly took the lead as change agents.

Forced by the problematic financial situation and high administrative burden, they searched for new partners in the supply chain willing to commit financially to the network. Therefore, in December 2006, they organized a meeting to win over the directors of an abattoir and two wholesale organizations that together ran a cooperative organization. Aware of the urgency of the situation, the change agents made careful preparations for the meeting. They built on their familiar approach of a personal meeting in an informal setting. Additionally, they mobilized a research scientist from an agricultural economics research institute. This was a contact from Verhoeven’s network, whom he had met during a previous farming research project. The scientist was introduced as an external, objective information source. He opened the meeting with a presentation, to inform the chain partners about future trends on sustainability issues in the sector. Next, Verhoeven expanded on the researcher’s argument:

“I simply explained that De Hoeve worked on the premise that the market demands for sustainability will go beyond what the law requires. We can either wait and see or we can take the lead. If you wait, your best farmers will leave. So you can choose to take the lead now and be the first, which is what our eco-labeled concept does. We’ll help you with implementation and we’ll reinforce each other.”

One month later, after careful reflection, the supply chain partners decided to become involved in the sustainable pig farming initiative.

*Acting.* The collaboration with the new supply chain partners occurred at the time that a new opportunity arose to regain a distinctive position on the market. As the eco-label Milieukeur did not trigger sufficient consumer response, another added societal value had to be found. This became the action to bring *uncastrated* pigs to the market. This was a bold choice as it anticipated societal acceptance, from consumers and competitors in the sector but also from the NGOs that had started the societal discussion on piglet castration and animal welfare. The change agents knew their proposal had far-reaching implications. They also knew it was feasible because the director of the abattoir had found a technical solution<sup>1</sup> that did away with the need for castration. They had started to test this solution but had not yet informed the farmers “because it was a controversial intervention” (Verhoeven).

<sup>1</sup> The solution was a simple “meat-frying test”. In order to test the odor of meat the change agents drew on the knowledge of an experienced sampler employed by the abattoir.

This approach shows that the supply chain collaboration made the chain processes more transparent. It was up to the change agents to convince all parties to become the first supply chain to implement this drastic modification. The abattoir–wholesale cooperative organization was willing to take the financial risk of a first no-castration project, assessed at 1.5 to 2 million euros. And the cooperative organization arranged for a guaranteed boar meat market through a contract with the Coop supermarket chain. These guarantees helped to gradually convince the farmers to stop castration.

What had started as an animal welfare initiative proved a financial success for the sustainable pig farming initiative. Suddenly, farmers were queuing up to join the initiative because uncastrated pigs were generating more revenue. The project to stop castration resulted in growth at an unprecedented pace.

Van den Eijnden: “The castration project proved to be a catalyst. From 2007 growth accelerated, leading to 180 members one year later. The number of pigs delivered increased from 2000 to 18,000 a week.”

*Building relationships.* During the revitalization period, collaboration was re-established but also extended to many different partners outside the supply chain (e.g. governmental and non-governmental organizations), that Verhoeven had met during his time as a board member. To prevent potential objections of other abattoirs or wholesalers to the project and to mitigate any adverse publicity, the change agents informed market parties such as other abattoirs of their strategy, and sought help from the Ministry of Agriculture.

Remarkably, from 2007 the middlemen returned to manage further growth of the initiative. The new group of middlemen was now part of a joint effort and equal responsibilities in the chain, instead of the ones that controlled the whole supply chain themselves, as Verhoeven explained:

“The approach of the middlemen was more personal and transparent than in the old days. They were self-employed suppliers, not employees of the abattoir”.

Therefore, the farmers could agree with the re-introduction of the middlemen. The expansion of the initiative attracted more middlemen, who in turn introduced more farmers. As their position in the market became stronger, the change agents realized that they could demand certain production volumes and make quality agreements with the middlemen. Even in their social interactions with the middlemen, the change agents remained loyal to their personal and forthright style of arranging informal meetings:

Verhoeven: “We invited a new middleman to discuss a project. He had never visited Kruiswijk [the wholesaler] before. We had a discussion over coffee. Later Kruiswijk’s wife served drinks and snacks. That domestic touch really touched the middleman. We all watch our bottom line, but these things make a difference too”.

*Further development and innovation (2010–2016): Focus: remain front runner via far-reaching partnerships Outcome: rapid growth, increased innovation*

*Communicating.* In 2010 the sustainable pig initiative had consolidated its position. The change agents had built a network of

partners and the collaboration in the supply chain had generated the expected financial benefits. However, it soon became clear that front-running in sustainability was no longer a given for the sustainable pig farming initiative, because rival initiatives were beginning to catch up. Knowing how to anticipate future developments in the pig sector and how to mobilize their partners, Verhoeven stated:

“We're always looking ahead and know what people want from us by 2018. We have put down our ideas on paper and we have the capacity to organize all parties involved around future sustainability issues”.

After a session of reflection, the change agents decided to distinguish their business model from the upcoming eco-labels and other sustainability initiatives in pig farming by starting a new, autonomously developed eco-label, *Keten Duurzaam Varkensvlees* (KDV) (which translates as Sustainable Pig Meat Chain). The language of the KDV eco-label introduction showed that the local sustainability language further developed. Moreover, the launch of the new eco-label was accompanied by professionalized communication: the change agents hired personnel for marketing and communication and for certification procedures. At the same time they continued informal communication and personally visited all 180 farms.

*Acting.* The focus on innovation became also visible in the activities that were set up. The change agents used the knowledge and experience in the supply chain and the surrounding network to develop various sustainable innovation projects related to pig farming, such as the introduction of solar electricity systems, improved ventilation, CO<sub>2</sub>-neutral barns, no docking of piglet tails, an innovation project on antibiotic use and the development of toys to prevent pigs becoming bored and stressed. Recently, in 2016, they have increased the scope of their sustainable innovations as they started a project to install mono manure digesters on all farms and thus creating closed loop production systems.

*Building relationships.* Although there were strong financial ties and interwoven business interests between the change agents and their supply chain partners, the inter-organizational relationships were initially not formalized. However, in the consolidation period the change agents began to formalize several inter-organizational relationships, such as the contracts for farmers and middlemen, and certification procedures. Nevertheless, the parties involved still perceived these relations as being informal and personal, and based on trust and transparency.

Furthermore, in 2015, the development of their own eco-label provided an occasion to formalize the partnership between the change agents and the abattoir-wholesaler supply chain partners. The group wanted to secure the joint rights of ownership by setting up a foundation for the eco-label. And in 2016, for instance, the change agents made good use of the knowledge and connections of the Green Mind, which is a Dutch network of prominent scientists that collaborated with companies to develop sustainable business models. At a network meeting the change agents presented their efforts and current questions, and managed to find investors for their extensive closed loop system of manure digesters. Thus, after 17 years, the change agents carry on building their network of chain partners, NGO's, governments and knowledge institutions such as universities and public-private innovation networks.

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