Journal of Cleaner Production xxx (2012) 1–9

Contents lists available at SciVerse ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Social learning in regional innovation networks: trust, commitment and reframing as emergent properties of interaction

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ARTICLE INFO

Article history:
Received 16 January 2012
Received in revised form
20 July 2012
Accepted 21 July 2012
Available online xxx

Keywords:
Social learning
Multi-actor innovation networks
Rural and regional development
Sustainable development

ABSTRACT

Social learning in multi-actor innovation networks is increasingly considered an important precondition for addressing sustainability in regional development contexts. Social learning is seen as a means for enabling stakeholders to take advantage of the diversity in perspectives, interests and values for generating more sustainable practices and policies. Although more and more research is done on the meaning and manifestations of social learning, particularly in the context of natural resource management, little is known about the social dynamics in the process of social learning. In this contribution an integrated hypothetical framework that provides a better understanding of social learning as a generative process with outcomes is presented. This hypothetical framework is grounded theoretically in emergent social learning theory and empirically in a retrospective case study around multi-stakeholder sustainability-oriented regional learning in the North of The Netherlands. Our findings indicate that trust, commitment and reframing are interrelated aspects and emergent properties of interaction in the process of social learning. Hence, the framework presented reflects social learning as a dynamic process, in which trust, commitment and reframing are continuously produced and reproduced through the (inter)actions of the individual actors.

1. Introduction

I'll let you be in my dream if I can be in yours – Bob Dylan

Society faces a multitude of intricately intertwined sustainability issues related to energy use, loss of biodiversity, natural resource management, climate change, food security and food safety and so on. These issues have increasingly received attention from the perspective of ecological, economic and regional development because sustainability issues often have specific characteristics (e.g. Pike et al., 2007; Quétier et al., 2010; Valkering et al., 2011). Examples include:

- Climate change impacts on a river-basin (Valkering et al., 2011);
- Changing roles of rural areas as metropolitan pressures on the countryside increase and become more varied (Hermans et al., 2010; Quétier et al., 2010);
- The interface between indigenous local knowledge and universal knowledge systems in organic food production (Eernstman and Wals, 2009);
- Rethinking personal mobility systems at local, regional and national levels (Vergragt and Brown, 2007).

In many sustainability studies, including the ones listed above, researchers consider the regional scale level as a crucial level for dealing with sustainability management issues, because this is the level at which ecological processes and human activities most intensely interact (Bohunovsky et al., 2010; Graymore et al., 2010; Cundill, 2010).

It is thought that the regional level holds a specific capacity for the generation of new knowledge created in *multi-actor innovation networks* (Pekkarinen and Harmaakorpi, 2006) in which, for instance, farmers, scientists, students, NGO's and policy makers together can find new answers to existing social, economic and ecological problems. Indeed, such diverse groups of actors representing a range of perspectives, values and interests are seen as a prerequisite for dealing with sustainability issues (Van Asselt, 2000; Wals, 2007a,b). However, creating pathways towards sustainability does not occur through the mere combination of existing knowledge, but requires on-going interaction between multiple actors willing and able to lay their own values and interests on the table (Koutsouris, 2008). Sustainability problems are best addressed when multiple actors with diverse interests and perspectives develop a shared frame on a jointly perceived problem

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http://dx.doi.org/10.1016/j.jclepro.2012.07.041

or challenge, which enables joint action (Pahl-Wostl, 2006; Sriskandarajah et al., 2010). This process is increasingly referred to as social learning. Social learning, as we will elaborate later on, has been shown to facilitate innovation and possibly foster the pathway for positive transitions in social–ecological systems (Cundill, 2010; Stephens and Graham, 2010; Tukker and Butter, 2007).

Many accounts of social learning (e.g. Pahl-Wostl and Hare, 2004; Schusler et al., 2003; Bouwen and Taillieu, 2004; Woodhill, 2003) provide rich images of the various factors and processes involved in social learning and its needs for facilitation. However, the *dynamics* of social learning have not received such attention from scientists (Bouwen and Taillieu, 2004; Reed et al., 2010). The challenge of a successful social learning process underscores the need for theories about social learning that can help us understand social learning not only in terms of the interaction taking place between the stakeholders but also in terms of the dynamics, in terms of knowledge and social relations, produced by this interaction (Beers et al., 2010).

The main research questions we will address here are:

- What factors drive social learning in a context of diverse and conflicting interests?
- What is the role of trust, commitment and reframing in social learning?
- How can we foster the dynamics of social learning?

First we will introduce regional sustainable development as a suitable context for investigating social learning challenges. Then we discuss several theories on social learning and knowledge co-creation, after which we present our research methods and the empirical case in which our research questions are addressed: a multi-actor innovation project in the province of Groningen, situated in the North of The Netherlands. This leads us to our key findings.

1.1. Regional development as a social learning context

A region can be seen as an area smaller than a nation that has an identity demarcated by boundaries (possibly as an administrative entity) or that can be identified by relatively homogeneous economic, social, cultural or landscape characteristics (Van Zeijl-Rozema and Martens, 2010). In regional development processes, different (groups of) actors often have different ideals and images of what a region is and what it should be (Quétier et al., 2010). Pekkarinen et al. note: "The real competitive advantage of regional innovation networks is based on their ability to create knowledge in a collective and interactive learning process" (2006 p. 410). An important question then becomes: to what extent are the different actors involved able to find future trajectories for the benefit of all?

A regional approach to sustainable development has several advantages. First, regional actors often have somewhat unique localised knowledge that is not available outside the region and that can help in identifying promising directions for sustainable development (Bohunovsky et al., 2010). Furthermore, at the regional level it is often possible to involve the actors that are in power and that have the capabilities to implement possible solutions that emerge from a social learning process (Bohunovsky et al., 2010). However, this does not make it easier to deal with clashes in interests of different actors (Pike et al., 2007).

An example of a collaborative eco-system management problem is: "How can we combine agriculture, nature and tourism in the area in a mutually beneficial way?" This is the kind of complex management problem that is at the heart of our empirical case in the "Westerkwartier" (The Western Quarter) region in the Netherlands where a range of societal pressures is threatening the sustainability of the region. For instance, farmers are facing strong global market developments, which force them to either intensify their operations or to change to completely different business models. At the same time, nature conservationists are finding it increasingly difficult to preserve existing natural resources. Furthermore, rural and urban citizens again have different needs and desires regarding the region's livelihood and service level but they share the perception that the Westerkwartier is a rather poor regional backwater.

The challenges of social learning processes are closely related to the complexity of multi-actor networks (see also: Persson et al., 2011; Leys and Vanclay, 2011). In regional development processes the actors involved often represent different societal sectors, such as; education, government, research, trade, NGO's and primary production, and generally include researchers, entrepreneurs, educators, government workers, and NGO representatives. Each actor tends to be (semi)organized in some kind of stakeholder group or constituency and represents specific interests and goals, which influence their commitment of knowledge, creativity, resources and talents to regional development (Lebel et al., 2010). This situation is illustrated in Fig. 1.

Seen from the perspective of a shared multi-actor project, each of the members is also a representative of a constituency. A multi-actor network results from multiple multi-actor projects (and other activities) that form links between many more project participants and their constituencies. Social learning in a multi-actor network is influenced by interactions between project members and their constituencies. However, in this contribution we focus on the behaviours and interactions between the actors in the network.

1.2. Multi-actor learning

The concept of social learning explicitly includes the concept of learning. Therefore we first elaborate shortly on some concepts on learning from a social constructivist background, drawing on educational and organisational learning theories, before we focus on to the concept of social learning itself.

Several scholars have pointed out the social, interactive nature of learning in general. Wenger (1998) poses that learning is the

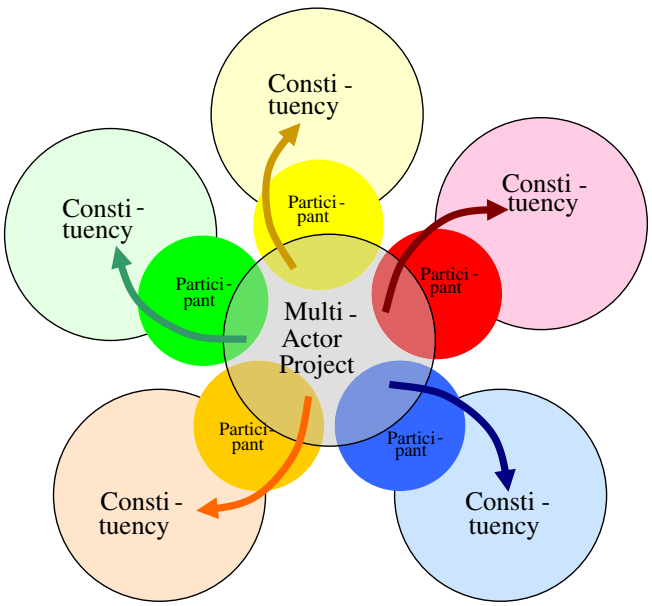

Fig. 1. Multi-actor innovation project form network links via project members and their constituencies.

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ability to negotiate new meaning and is fundamentally experiential and social in nature. Vygotsky, writing about individual development, states: "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological)" (1978). These approaches emphasise that learning is a social, interactive process, regardless of whether it is individual or social.

Alexander et al. (2009) define learning as "a multidimensional process, that results in a relatively enduring change in a person or persons, and consequently how that person or persons will perceive the world and reciprocally respond to its affordances physically, psychologically, and socially" (p. 186). This definition emphasises the result of learning, that is, learning can be seen as change, first in perception and then in behaviour. And again, this definition can apply to individuals as well as groups.

Following on this, and echoing educational thinkers like Piaget (1964), Berlyne (1965) and Festinger (1957), we define learning as an interactive process that leads to some form of dissonance as a result to being exposed to alternative ways of seeing, knowing and understanding, coupled with a desire to overcome such dissonance by changing one's own thinking in sometimes subtle and sometimes more radical ways. As such, learning can result in a change in perception, knowledge and behaviour of individuals, organisations and/or groups.

We can now define *social* learning as an interactive and dynamic process in a multi-actor setting where knowledge is exchanged and where actors learn by interaction and co-create new knowledge in on-going interaction. By using the adjective 'dynamic' we want to stress that there are internal changes in social interaction between actors that affect both the quality and effectiveness of such learning. Although external dynamics such as power, hierarchy, trends, issues, money, time etcetera might play an important role in the way actors behave in a multi-stakeholder setting, we do not take these factors into account here. Instead we only deal here with the behaviour of the actors involved.

By using the term 'multi-actor setting' we want to stress the importance of diversity. Multi-actor networks in regional development consist of people who represent themselves and/or an organisation and/or a network. The multi-actor approach stems from the participatory perspective in environmental management, where it is argued that not one party such as science, but all relevant stakeholders have to become the main drivers of change (Groot, 2002). Actor diversity is often regarded as an important source for social learning, because it enables a broader and more integrated understanding about the issues at stake, and a greater capacity for joint action and learning (Gaventa and Cornwall, 2001).

But diversity can also turn out to be barrier. The heterogeneous composition of a multi-actor innovation network, with different values and interests, combined with the very "messy" character of the complex problems involved, often is reflected in large differences of perception (Pahl-Wostl, 2006; Fadeeva, 2005). An individual's institutional affiliation or constituency may have a strategic agenda that may or may not be in-line with his/her personal agenda. In that regard, some scholars wonder what state is more common in a multi-actor network, one of learning or one of conflict (Leeuwis, 2000).

Furthermore, individual and organisational scale differences can further complicate social learning, because organisational interests and values often limit the freedom to act of the people that represent them. With regard to this interplay Wenger et al. (2002) states that communities are themselves instruments of the transformation they require by transforming an organisation's culture through their collective influence on its members and the teams and units with whom they interact.

In sum, the complexity of multi-actor innovation networks is characterised by differences in goals and interests, and the interplay between the personal, the network or community level and organisational levels. Moreover the *process* of social learning is embedded in a web of power- and trust-relationships (Leeuwis, 2000; Barnaud and Van Paassen, 2010; Wildemeersch, 2007; Hildén, 2011; Avelino and Rotmans, 2011). In the optimal case, a multi-actor innovation network comes to develop a unique problem perspective, creating innovative solutions to shared problems (cf. Wenger, 1998). In the worst case, mutually exclusive perspectives divide the participants, who cease listening to each other (Van Eeten, 1999).

1.3. Theories about social learning

So, what supports the process and outcome of social learning in a multi-actor innovation network? For answers, we turn to existing theories about social learning. When a group is successful at social learning, it learns about and *reframes* shared issues and actively engages different groups in society in a process from understanding conflicts and dilemmas towards implementing strategies together for dealing with them (Woodhill, 2003). Schön and Rein (1994) define 'frame' as "a taken for granted assumptional structure, mostly based on values and judgements" (Schön and Rein, 1994). This means that specific frames lead to specific perceptions of an issue at stake and that these perceptions are tinted by the values and judgements of the actor who holds them. (Re) *framing* here refers to the emergence of new, shared perceptions on the issues faced by a relatively heterogeneous group exploring a mutually perceived but somewhat ill-defined challenge such as regional sustainable development (Groot, 2002; Wals and Heymann, 2004).

Having different frames can be detrimental to social learning when actors are unable to deal with their differences. Doing so requires being open to each other and willing to understand the issue from the other's point of view (McGregor, 2007). In this regard, *trust* can make it easier to deal with mutual differences. Various scholars have identified trust as an enabling factor that makes it easier to share knowledge and experience in multi-actor networks (Paul and McDaniel, 2004). In particular, trust may facilitate learning and innovation in the face of the ambiguity and unstructured nature of wicked decision problems (Paul and McDaniel, 2004). For the matter of dealing with different frames, trust can make it easier to be vulnerable towards acts of others. Here, we define trust as the expectation that others will act in a way that is agreeable for you without the possibility of you intervening (based on Peeman, 2009).

1.3.1. Social learning as double-loop learning

First order learning usually refers to the optimization of existing routines, practices and systems. As such, first order learning does not require a deeper reflection on the underlying assumptions of those routines, practices and systems as they tend to be accepted and uncontested. First order learning is appropriate when a system's sustainability is not questioned. It is less useful when trying to create new systems based on different values and assumptions than the old one (Sterling, 2007). Working towards sustainable development often requires system innovation and calls a status quo into question. It requires learning aimed at innovation, based on new ways of perceiving ourselves and others, and the issues at stake (Brockbank and McGill, 2006). Such learning towards innovation is called second order or double-loop learning (Argyris and Schön, 1978).

Double-loop learning is akin to reframing because both concepts include the notion of radical changes in underlying beliefs and values (Pahl-Wostl, 2007), and both imply social action, social reflection, social analysis and social planning (joint decision

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making). This process "often involves resistance, for it poses challenges to existing beliefs and ideas, reconstruction of meaning, discomfort and difficulty but also sometimes excitement" (Sterling, 2007 p. 72).

1.3.2. Social learning as a dynamic social process

The process of social learning is often described as an iterative and on-going process that comprises several learning loops (with phases of action, reflection, analysis, and planning Kolb, 1984; Pahl-Wostl, 2006; Wildemeersch, 2007). As a consequence, the dynamics of a social learning process are unpredictable and indeterminate: longer periods of relatively stable learning can be interspersed with sudden breakdowns or sudden take-offs. These dynamics can be registered as sudden drops, shifts or increases in terms of mutual trust, shared frame and/or commitment among the associated actors, which in turn affect how these actors interact (Beers et al., 2010). Therefore the dynamics in the process of social learning affect not only the process itself but also the outcomes of the social learning (Koutsouris, 2008). As people and organisations collaborate, a social learning process *can* produce intangible outcomes in the form of improving mutual relations and increasing mutual trust (cf. Hermans, 2011). The associated challenge is how to establish such trust, how to orchestrate the interaction so that it fosters reframing and, in the end, (commitment to) concerted action (Roux et al., 2011).

In sum, theories about social learning suggest that processes of reframing and double-loop learning are major features of social learning. They also indicate that the complex context of societal problems creates a very dynamic arena of actors and social interactions with the possibility of changes in levels of trust, commitment and reframing.

2. Research context and framework

2.1. Case: the Westerkwartier, province of Groningen

As stated earlier, the rural region of interest was the "Westerkwartier" of the province of Groningen, the Netherlands. To address the rising regional tensions between state forestry, citizens and agriculture, a project called "Bridge to the Future" was initiated by Wageningen University with key community members. The intention was to start up a new learning network, in which societal actors, students and supervisors could learn, share, transform and co-create knowledge and innovative solutions in an open and explorative way, by creating sustainable relationships in equality. A large challenge was to overcome boundaries and build bridges between different sectoral interests and between top-down and bottom-up representation. With 'top-down' we refer to decisions made by regional policy makers. With 'bottom-up' we refer to all regional stakeholders without formal decision-making power, such as citizens' initiatives. The "Bridge to the Future" project featured a "bottom-up" integrated action research approach to initiate a multi-actor network of local stakeholders (farmers, forestry-manager, administrators, cultural heritage preservers, tourism entrepreneurs and others) with the aim to get them actively involved in regional policy development and implementation.

Another aim of the project was to provide students with a learning experience in the context of a real-world complex regional development process. The project team consisted of three Wageningen University researchers/teachers and an independent project leader (the lead author of this manuscript). The student group consisted of eight students from different disciplines in higher education. The students were guided by the project team.

The project lasted about five years and during this period numbers of participating regional stakeholders fluctuated. During the start-up year around one hundred people participated in workshops, meetings, interviews and a regional public event. At the kick-off meeting fifteen regional stakeholders participated (Table 1).

In this contribution we have opted to focus on the first year of the project as this period proved to be especially rich with regard to social learning dynamics, in part because this period featured the uncertain and indeterminate inception of a multi-actor innovation network.

2.2. Action-oriented education and research

The project "Bridge to the Future" invited the students to work in an action-oriented, learning-by-doing mode, by regarding their co-operative inquiry as an essentially emergent process. The action-oriented approach implied that the students would work in a transdisciplinary fashion (Regeer, 2010), meaning that they would interact with the complexity of society *and* would integrate different disciplines in their research. They would stay for several weeks in the area to get to know the relevant actors, the issues at stake and the region itself.

An action-research approach was chosen in order to treat complex regional issues in a collaborative mode. In action research, a cyclical process of planning, action, reflection and analysis results in the development of new or revised plans (Zuber-Skerritt, 1993; Wals, 1994). An important assumption underlying such approaches is that participants come to own the issue at stake and feel responsible and accountable for working on it through teamwork. This also means that "truths become products of a process in which people come together to share experiences through a dynamic process of action, reflection and collective investigation" (Gaventa and Cornwall, 2001, p. 75). Thus, a certain level of equality is necessary in action research, "where a researcher is one of the actors and not a supreme authority" (Gustavsen, 2006, p. 25).

The student–researchers and the project team had to be aware of and sensitive to the political agenda of the governments involved, which tended to downplay the bottom-up process. A methodological path was followed that resembles the transition management model (Kemp et al., 2007) which included: 1)

Table 1
Regional stakeholders; number of persons and stakes at the kick-off meeting.

Regional stakeholders	Number of actively involved persons	Stake
Agrarian Nature Organisation A	2	How to keep farming viable with nature
Agrarian Nature Organisation B	2	How to develop more nature on farms
Rural Tourism Entrepreneur (Bed & Breakfast)	1	How to get more tourists
State Forestry	2	How to develop nature with farmers and other regional actors
Municipality of Grootegast	3	How to keep the region viable at municipal level (What can we do with abandoned farmhouses?)
Province of Groningen	2	How to support the region in development and match this with the policy agenda
Foundation For Regional History "The Tasman Cabinet"	1	How to put the region Westerkwartier "on the map"
Organisation for Rural Cultural Consciousness "The Kwartiermakers"	2	To spread knowledge and awareness about Regional Culture and Nature

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establishing a non-official working group for regional development, 2) facilitating the development of a shared problem perception by both regional stakeholders and students, 3) supporting learning and knowledge sharing throughout the process employing an experimental, learning-by-doing mode, and, finally, 4) employing periodic monitoring and evaluation particularly of critical events.

At the start of the project the project team and the participating students did not know much of the area and the issues at stake. The regional stakeholders were not organised around issues, the existing network was rather loose and open. The project team hoped that the regional actors would accept the participation of the researchers and the students and that the students would be committed to the participative process. The project team therefore decided to organise several opportunities for interaction between regional stakeholders and students to invest in social relations, knowledge exchange and co-creation. The following three consecutive activities were decided upon:

1. A formal *kick-off*, followed by monthly meetings with selected regional stakeholders.
2. Several weeks' worth of *field work* by students staying in the area.
3. Organising a *region day*; an event at which existing views and new knowledge could be presented and discussed between 55 stakeholders involved.

These three activities were then complemented by three additional activities:

4. A regional day, at which results of the students were discussed
5. Reflective meeting
6. A go/no go meeting.

At the kick-off event, fifteen regional stakeholders, all eight students and the three project team members exchanged concerns, desires and key interests.

The students – together with their supervisors – used the proceedings of this event to formulate the following shared problem statement: "How can we simultaneously maintain the landscape as it is, keep farming economically viable and improve the region's vitality?" The regional actors could easily recognise their own stakes in the shared problem statement, which fostered initial trust and commitment for their participation. This question also provided an interdisciplinary starting point for identifying student Master's thesis topics.

2.3. Methodological considerations and methods

The lead author acted as the project leader in this "Bridge to the Future" project. The lead author documented her experiences during the project as well as the history of the project itself. During the project many notes were taken. These notes were discussed within the project team, which consisted of three researchers and the project leader. Besides that an external researcher was asked to document the process over the years in retrospect (Derkzen, 2008). In addition reflective filmed interviews were held with some regional key-stakeholders, which resulted in a DVD (Smarter Together, 2010). These interviews were transcribed. Then, at last three scientists – the authors of this article (including the lead author/project leader) reflected on all materials, in reconstructing the social learning history. From these experiences, the main events that occurred with the project in the period 2003–2008 were identified.

The researchers took the written descriptions of the key events from the first year of the project as a basis for reflection and interpretation in retrospect. This means that the methodology applied is not an evaluation, but an ex-post analysis. This approach can serve as a reflexive inquiry during which the research team tries to (re)describe and (re)interpret data, ideas and concepts. The aim is to bring together past experience in order to highlight 'lessons learned' with specific interest in those aspects that are seen as key elements for social learning (Rodela et al., 2012; Dillon and Wals, 2006).

The analytical focus was on the relatively stable periods of social learning and the sudden changes in between. For each event, the social learning dynamics were explored using four reflective questions:

1. How did you perceive the situation? What was happening?
2. What did you decide to do, why? How did you intervene?
3. What were the effects of this intervention?
4. What did you learn from that? What would you do different a next time?

The answers to these reflective questions were then used to enrich the event descriptions. For instance, by discussing the reflections on an event, the second author would ask the first author to elaborate and specify as many aspects of the event as possible. Several project reports (Derkzen, 2008) and minutes of meetings, reflective video-interviews (DVD "Smarter Together" 2010) with key-stakeholders and participant observations provided additional empirical evidence for the event descriptions, and served as additional data sources. Our reflective approach fits Grin and Van der Graaf's (1996) description of an iterative process of continuing inquiry.

The interview notes and transcripts were analysed and compared qualitatively with the intention to discover some structure and coherency. Several aspects of regional stakeholders' ideas and experiences tended to repeat themselves with some variation, and after several rounds of interpreting, some patterns emerged in relation to trust, commitment and reframing. This approach resembles the 'grounded theory' which is a qualitative research methodology for developing theory that is grounded in empirical data which are systematically gathered and analysed, by looking for patterns, similarities and differences in events that are compared with each other (Groot, 2002).

The aim is to gather a deeper understanding of the dynamic learning process in relation to its outcomes. Of course we realize the risk of 'double hermeneutics', in this case where the lead author engages in the interpretation of her own interpretations and experiences. In order to reduce this risk and to reach some form of inter-subjectivity and consensus about both the patterns and the way they related to the framework, multiple researchers participated in the analysis and interpretation of the data.

3. Findings

3.1. Trust and commitment

Over the first three months, in which several meetings between regional stakeholders and students were organised, the number of shared experiences grew and feelings of respect and friendship – among stakeholders involved in the project – increased. During these meetings the students, the project team members (lecturers and project leader) and the regional stakeholders exchanged views and experiences in relation to the research questions. The regional stakeholders were organised as a steering committee, including farmers, the forestry-manager, public administrators from two municipalities and the province, a historic association and tourism entrepreneurs.

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In these meetings, the regional stakeholders learned that the project team took their interest and values seriously. This fostered mutual feelings of trust. Arguably, as the network developed, starting from a relatively loose multi-actor innovation network with diverse frames, it increasingly took on characteristics of a community, with shared practice and shared meaning (cf. Wenger, 1998). It appeared that the kick-off event had acted as a 'stepping stone' for the creation of trust and further commitment from the regional stakeholders towards the university (the project team and the students). This trust was expressed in commitment to joining meetings, to giving students plenty of time and honestly answering their questions. Trust was also shown by leaving room for mistakes. Students could experiment with different techniques and be creative in their field work. During their six weeks of field work, students regularly talked with regional stakeholders. The open, participative and neutral attitude of the students made them easy to trust and easy to talk to.

Furthermore, the students' questions made the regional actors rethink their own perceptions about the region, the landscape, its identity and its values. The Westerkwartier landscape is characterised by many small scale green grass plots, alongside long hedgerows with a maze of parallel narrow ditches. Initially, the regional actors saw their region as somewhat backward and remote. In contrast, the students thought the region to be beautiful, with plenty of silence and space. Through interacting with the students, regional actors started to see their region in a different light and to regard it with renewed interest. The regional actors *reframed* the region. In the words of a local citizen:

> "The typical Westerkwartier landscape is something of which I think that every inhabitant of this region is proud of. Both the landscape and the language are and always have been part of people's identity here. And now, because of all the questions of the students, people are more aware and proud of this identity."

3.2. A sudden decline of trust and commitment

Issues of ownership, power and commitment started to surface as the project evolved. Although the overall research question covered the diverse interests at stake, it was not entirely clear who was taking commitment and responsibility for the problem solving in farming, landscape and vitality (Derkzen, 2008). Especially the ambivalent attitude of the government representatives was a problem. They participated in the network and in monthly meetings, but they did not take a formal hold in the problem statement as government. Instead, their attitude was to 'wait and see'. One local citizen and participant in the project suggested that "[t]he municipality and the province don't really know how to act in these issues." This created an inequality regarding commitment and power; the ones who represented a more bottom-up approach (farmers, state forestry and historic association) were fully committed, but out of formal power, whereas the ones who represented the province and municipality were loosely committed, but in power to decide about resources such as time and money. This created tension within the network and made progress towards empowerment of the regional stakeholders in non-governmental positions increasingly hard. As a consequence, the interaction stalled, and a sudden decline in mutual trust and commitment occurred. In the words of one of the local informal leaders of the Westerkwartier Regional Initiative (WRI) network: "We just continued to give respect. I call it 'the art of empathy'. It doesn't happen when I walk around in my uniform [interviewee works as a state forestry-manager], it happens when you feel how somebody else feels and thinks. So: get to know their agenda and respect it. That is the path towards trust, in my experience".

3.3. Restoring trust and commitment

During the go/no go meeting all actors involved (e.g. university students and staff, government representatives, farmers, representatives of nature organisations and the state forestry) could express their future ambitions for the area, and articulate (new) research questions. The project leader wanted to find out whether a shared frame about the area still existed, despite the apparent breakdown, and if so, whether there was still sufficient common ground to continue the project.

At the meeting the participants exhibited a large variety of short-term and long-term ambitions for the region, varying from agricultural ambitions to water management and tourism ambitions. Many participants voiced a strong wish to continue in a bottom-up fashion, and if necessary, without formal government support. This plea for continued bottom-up change processes had important consequences for the social learning process. First of all, events at the go/no go meeting restored much of the mutual trust, because sharing the wish for proceeding with the project reaffirmed the shared frame that had emerged throughout the previous months. Furthermore, they reaffirmed the shared commitment, and also provided a way out of the issue of power and ownership.

Events at the go/no go meeting provided opportunities for joint learning and meaning making, which sharpened the project's aim for joint action. Enthusiastically, the actors thought up a name for this new initiative: Werkgroep Streek Initiatief (WSI), (the Working Group Regional Initiative).

The mutual trust and the commitment for further development spoken out that day created a strong basis for the (difficult) years to come. The working group had the ambition to integrate several issues in agriculture, landscape, cultural heritage, water, energy and tourism, to collaborate on a regional base and to engage both government and regional initiatives. Some years later this ambition led to the installation of a local action group within the EU-LEADER framework in which both regional actors and government actors are represented equally. The EU-LEADER framework provided a powerful tool and incentive for continued integrated regional development activities. Furthermore, the WRI developed – together with the local action group and many other regional actors – , a meeting point, a number of rural café's (organised as three-monthly meetings) and a European Country Side Exchange (a three-day learning visit from the European Network for Local Development consisting of researchers, farmers, NGO's and consultants from Ireland, Finland, Sweden and Germany). All these activities contributed to a simultaneous increase of trust and commitment, a growth of social learning and concerted action for regional development.

3.4. An emergent framework

Our reflection on the events during the first year of the project shed light on the interrelation between trust, commitment and (re) framing. From the start, a high level of trust between the farmer and the state forestry-manager could be observed. They were strongly committed to the integrated problem statement formulated at the kick-off event, probably because their different interests were represented. They seemed to trust that their interests were taken care of by the students. The province and municipality appeared less committed because they could not see how a bottom-up initiative could represent their interests at that moment. This lack of commitment in fact indicated a lack of trust. Instead of welcoming it, they regarded the informal network as somewhat threatening. Nevertheless both the municipal and provincial representative attended almost all the monthly meetings. A local farmer and chairman of the agricultural-nature organisation states:

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"The civil servants from municipality and province that participate in our meetings tell their colleagues stories about here, and I bet their colleagues know what is happening here! Of course [the municipality and province] don't know right away how to handle us. But for sure it is easier now to walk and talk with the province." This quote is indicative of both some distrust in the civil servants attitude and in the longer term trust in the outcome of the interaction process.

The process of reframing could take place because the people from the region trusted the attitude and the questions of the students. Because of this mutual trust, students gained access to local stakeholders and could start interacting with them. The interaction, in turn, resulted in a new, more positive frame of the region from several regional actors. The resulting regional "pride" created an impulse for new regional cultural networks and initiatives. Furthermore, the monthly meetings helped to reinforce the trust relation between regional actors and researchers.

It is interesting to understand how the difference in commitment between regional stakeholders and government representatives works. For the regional actors (farmers, state forestry, culture foundation, tourism entrepreneur) the ambiguity of the government slowed down the whole learning process. For example, simple questions remained unanswered and resources such as 'seed money' did not come easily. This resulted in pressures regional stakeholders' time and commitment. Consequently, the project stalled, which led to a sudden decline of trust and commitment. The alderman of one of the participating municipalities notes: "I thought at that time, they (the Working Group Regional Initiative) should be more concrete and should act faster. But now I realise that patience is the most important. And look now; a huge network of regional actors full of energy and plans."

These examples seem to support the notion that trust, commitment and reframing are influenced by interaction, and also that they can result from interaction. Furthermore, the results suggest an interrelatedness of trust, commitment and framing, in the sense that changes in the one may herald changes in the other. However, it might also be possible that high levels of trust yield unintended consequences, when people blindly follow a leader without having a stable point of reference.

A key outcome of the retrospective analysis of the Westerkwartier case is that social learning can be regarded as the dynamic interrelation of trust, commitment and reframing (see Fig. 2). When properly managed, social learning can spiral over time towards an increased potential change towards a more sustainable region.

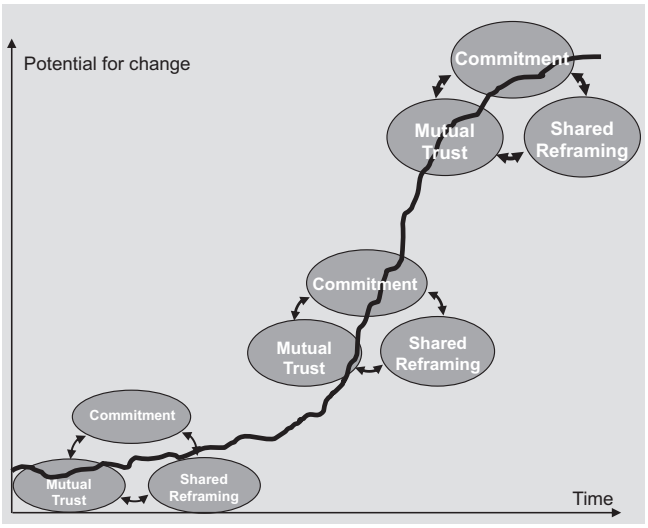

Fig. 2. Social learning as the dynamic interplay of shared reframing, mutual trust and commitment. Successful social learning can generate an increased potential for change.

We posit on the basis of the case that generative social learning is a dynamic process, in which trust, commitment and reframing are continuously produced through the actions of the individual actors. Vice versa, frame changes and changes in mutual trust and commitment influence the actions of the actors involved. As such, trust, commitment and reframing can be seen as emergent properties of social learning. The social learning process then can be seen as the continuous iteration of communicative actions by the project partners, including their contribution to new local knowledge and their questioning of each other's claims and values.

The constituent elements of this hypothetical framework are not new. The novelty of this hypothetical framework rather resides in the combination of commitment, mutual trust, and (re)framing as equally important aspects of social learning, and treating them as dynamic and emergent properties of social learning. The importance of this notion is that it takes the attitude, values, behaviour and actions of the project partners as the basic building blocks of the social learning process.

4. Conclusions and discussion

In this article we have explored social learning processes in regional sustainable development processes in the Dutch Westerkwartier region. The associated analyses have resulted in hypothesising a framework that integrates notions of trust, commitment and reframing and treats them as emergent properties of interaction. It is our intention to test this framework in further research. In this closing section we reflect on our results in the light of existing theoretical notions of (re)framing, mutual trust, and commitment.

Our analysis shows that trust, commitment and reframing are different, but interrelated aspects of the process of social learning. Different, because they can independently change over time, but interrelated, because changes in one of these aspects were shown to provoke changes in other aspects. Our case study showed that a slow decline of commitment resulted in a sudden decline in mutual trust later on. Furthermore, our analysis indeed suggests that trust, commitment and reframing can be seen as emergent properties of social learning. In another example from our case, a high initial level of trust from the regional stakeholders towards the researchers opened up possibilities for interaction with students. As a consequence of this interaction, reframing started: the students' outsider perspective led regional stakeholders to revise their own perspective on the region. At this point, we would not want to go so far as to suggest that our results confirm that trust, commitment and reframing are the only emergent properties in question but they do surface in a growing body of literature about social learning (e.g. Pahl-Wostl, 2006; Bouwen and Taillieu, 2004).

Grin and Hoppe (1995) emphasise that an atmosphere of trust and commitment to reciprocity is essential. Or, as Loeber et al. (2007, p. 89) puts it: "I'll let you in on my private considerations, if you let me in on yours." In order to break prevalent 'wait and see' attitudes, it often is necessary that participants are able and willing to go first. Possible relations in the development of trust and commitment and reframing are illustrated by Hoverman et al. (2011, p. 14), who state that frequent and meaningful communication interaction nurtures trust and develops commitment to action.

Commitment is the third aspect of social learning, and refers to how and the extent to which participants and their organisational backgrounds expend their resources on the goals of the project.

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Commitment can concern passion, motivation, but also resources like time and money. Commitment originates from strong interests and values with regard to the problem at hand and the goals of the innovation project, and results in high willingness to contribute, both in thought and in action. We found that a distinction can be drawn from the *personal* commitment of a participant in social learning process, and the *organizational* commitment of the organization she or he represents. The representative does not necessarily have the same type and level of commitment as his/her constituency. In our analysis, we focused on the personal commitment of the participant.

Several social learning scholars stress the importance facilitation in strengthening social learning processes (Muro and Jeffrey, 2008). Facilitation of social learning is particularly important when feelings of mutual insecurity and uncertainty emerge, for instance when people keep changing their minds in the phase of decision making (Wals et al., 2009; Wals and Schwarzin, 2012). Social learning requires that a certain level of trust is maintained, and facilitation can help doing this. A stronger emphasis on facilitating social learning and establishing social relationships are seen as essential preconditions for effective sustainability management (Roux et al., 2011). Facilitation can offer a place where people feel secure, are not afraid to make mistakes, and can mediate between the different frames and interests actors and their constituencies have. Such interventions can foster the development of trusting relations.

Our analysis only enables us to draw very general hypotheses about the role of the facilitator. One such hypothesis is that the facilitator should monitor both slow and sudden changes in trust, commitment and framing (the emergent properties of social learning), and to react to these changes by intervening in the interaction processes. One such intervention can be the facilitation of reflexivity, as a way to make personal experiences, perceptions and wishes more explicit. Reflexivity, in turn, might lead the actors to develop more self-awareness and more insight in their own and others' levels of trust, commitment and reframing.

In closing; this research resulted in an empirically grounded framework as a tool/heuristic for understanding and facilitating social learning in complex change processes involving multiple actors. To further test the hypothetical framework more research on changing levels of trust, commitment and reframing and their indicators in social learning processes has to be done. Second, more research should be done on the relation between internal dynamics and external context dynamics of social learning. Especially the effects of social learning in multi-actor networks on the organization that the people represent could be an interesting field of research.

In its current form, the framework may serve several specific purposes. First, it may help researchers to understand the emergent properties of social learning in relation to the learning processes and learning conditions in regional networks. Second, such an understanding may be used to improve the quality of social learning because it may provide facilitators with a heuristic that they can use as a tool for analysis and subsequent intervention. Third, the framework might contribute to more effective social learning and improved regional sustainability and eco-system management.

Acknowledgments

This research has been carried out in the context of the Dutch Ministry of Economic Affairs, Innovation and Agriculture policy-support research cluster "Knowledge" (BO-09).

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