Framing cooperation as a key element for sustainable agriculture and food production: an analytical framework
Impressum

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Abstract

This paper discusses the role of cooperation in innovation processes for a sustainable agriculture and food sector and develops a research-based framework for better understanding of cooperation, as a prerequisite for managing it better. First, we review literature from a) economics and business administration and b) industrial and network sociology, which mainly ask how cooperation may support economic performance. Then, we include thematic perspectives on sustainable agriculture and food production, such as c) innovation studies for sustainable development and d) rural sociology. To extract central categories for our analysis, we compare the findings of these literature strands, explore common attributes and identify their complementary as well as contradictory aspects.

Second, based on this review, the paper constructs a framework for empirical analysis of cooperation that addresses practitioners, reflecting the specificities of cooperation for establishing sustainability innovations. It highlights the following characteristics: the goals of cooperation, selection of actors and distribution of costs and benefits between collaborating partners as well as the role of operational management within cooperation. Along the temporal dimension, we differentiate between four phases of the cooperative process: initiation, development, realisation and transformation. The paper concludes with a discussion of blind spots of the reviewed research strands and points out the potential of the framework for empirical analysis and practical purposes.
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1. Introduction: Potentials and limits of cooperation

Specialisation, division of labour and economies of scale in the food production system have led to enormous increases in productivity and efficiency – and to a broad range of unintended environmental and social side-effects that are not sustainable (Vanderplanken et al., 2016). Taking up these challenges, many excellent ideas for sustainable agriculture and food production have emerged which often cannot be established successfully within the dominant structure of food markets, regulations, subsidies and consumption patterns. Hence, alternative forms of sustainable production and niche innovations do not generally diffuse automatically to replace out dated elements of the incumbent agri-food regime (Grin et al., 2010; Ingram et al., 2015; Maye, 2013).

Rural sociology describes the background of the present constellation as follows. Agriculture and rural areas have undergone rather fundamental changes in the last decades, shifting from a “productivist” to a “post-productivist” era (Van der Ploeg et al., 2000; Knickel et al., 2004, 2009). An increased recognition of the multi-functionality of agriculture and rural areas has also been accompanied by a “turn to quality” and the rise of alternative agro-food networks (Goodman, 2004). Knickel et al. (2009, p. 134) argue that the pace and intensity of transitions in agriculture and rural areas indicate a “second order change”, which is challenging widely shared assumptions.

Marsden frames sustainable rural development as a form of eco-economy, understood as a place-based approach that needs to be embedded into societal and cultural relations (Marsden, 2012). From such a systemic point of view, rural areas and communities are considered to be platforms and starting points for diversifying rural economics and sustainable development (Knickel et al., 2009). The emergence of alternative business models and recombinations along value chains, such as community-supported agriculture (Flora and Bregendahl, 2012), fair-organic initiatives, or regional marketing initiatives, underlines these observations. Knickel et al. (2009) point out that innovation processes often are the result of collaborative networks, wherein exchange of information and learning processes take place.

Against this background, practitioners as well as researchers advocate cooperation in order to pool forces and resources to overcome obstacles, and analysis of best practice cases demonstrate its potential (Knickel et al., 2008; Marsden and Smith, 2005; Schermer et al., 2011; Anderson et al., 2014; Dyg and Mikkelsen, 2016; Brunori et al., 2010). Cooperation promotes concerted pursuit of goals, bringing together actors and their resources. Therefore, it would seem quite capable of playing a role in sustainable development of the agriculture and food sector. However, a widely acknowledged concept of cooperation is lacking. One reason for this is that cooperation is a colloquial term, lacking analytical rigor; another reason is that different disciplines use it with diverse meanings (Etter, 2003, p. 40). As a consequence, different
research strands have provided a broad range of concepts, but an overview of and orientation within them have been scarce.

The goal of the present paper is to develop a research-based framework for cooperation regarding sustainability innovations in the agriculture and food sector. This framework is intended to have a twofold function. On the one hand, it seeks to provide a comprehensive set of categories and criteria for empirical analysis of a broad variety of forms of cooperation in research. On the other hand, it seeks to form the base for a “cooperation management” tool that could help to enable practitioners to examine the strengths and weaknesses of their cooperative efforts, in order to manage them more successfully. Although it may generally seem like a good idea, actually cooperation is not always appropriate, because it requires resources, entails costs, has limitations and relies on certain prerequisites. For these reasons, it is important to achieve a better understanding of why, when and how cooperation may contribute to sustainability innovations in agriculture and food production.

Our research questions are as follows:

- What approaches and categories can be found in the literature to effectively conceptualise and analyse cooperation? How can the strengths, potentials and opportunities as well as costs and limitations of cooperation be identified and described?
- What are the specific challenges of cooperation for the development and stabilisation of sustainability innovations? How can these challenges be operationalised?
- How can a comprehensive framework for analysing cooperation for sustainability innovations in agriculture and food production be structured?

To answer these questions, our paper reviews different strands of the literature from cooperation and innovation research, relates the findings, identifies key characteristics of cooperation and extracts analytical categories to be used in the framework developed here.
2. Methodological approach: explorative literature review

The development of our framework is based on a selective literature review that reflects theoretical and conceptual thinking as well as analytical and empirical findings about cooperation. Based on a broad understanding of cooperation, the framework is supposed to support analysis of manifold forms of cooperation in the agriculture and food sector. Different disciplines have their specific perspectives on cooperation, e.g. economics regards cooperation as a means to improve the market position of enterprises (Swoboda, 2003; Porter, 1998; Porter and Kramer, 2011), while sociology considers cooperation as a means of social coordination (Weyer, 2011a; Sydow, 2010). However, there has been little exchange between disciplines with regard to engaging in an overarching conceptual debate within the social sciences about cooperation. As a consequence, our literature review considers different strands of existing research separately. For this reason, an explorative literature review was conducted using berry-picking from “classics”, conceptual papers as well as empirical studies mostly from the field of agriculture and food production production (Onwuegbuzie and Frels, 2016; Sandelowski and Barroso, 2007, pp. 41-50). Here we aim at gaining an overview of the rather diverging conceptualisations and logics of cooperation in the literature; therefore, we sought to examine pieces from the literature that highlight typical characteristics and peculiarities of the respective strands of research they are embedded in. But, due to the overwhelming body of literature, a systematic review did not seem either appropriate or feasible.

Our review begins with two strands of research that focus on how cooperation supports the economic performance of single enterprises: a) economics and business administration, including institutional economics, and b) industrial and network sociology. Further, literature regarding the particularities of sustainability innovations in agriculture and food production was also considered from c) innovation studies, with a special focus on sustainability innovations, and d) rural sociology. While economics and innovation studies take the perspective of the individual organisation in cooperation, network sociology and rural sociology focus more on the social or regional context, respectively.

In the following section, the specific perspectives of different disciplines are highlighted. A rough image of each research strand is drawn without going into details, emphasising the differences between them rather than areas of overlap or similarity.
3. Cooperation for sustainable agriculture and food production: theoretical approaches and central categories

The findings for each strand of the selected literature are structured in the same way: The overview begins with a generic description of the perspective on cooperation taken within the strand. Then, guiding questions are formulated in order to highlight the conceptual focus of the approach. Against this background, the main findings are presented. In concluding, the strand’s contributions to our framework are summarised.

3.1. Economic perspectives on cooperation

3.1.1. Economics and institutional economics

The economics and business administration literature serves as a starting point to understand cooperation between enterprises. The underlying assumption of this perspective is that cooperation has to be explained from an individual perspective, based on the model of *homo oeconomicus*. Thus, motivation for cooperation is seen as obtaining benefit for a single enterprise, and economic performance is the main indicator for successful cooperation (Swoboda, 2003). Economics hardly considers the social context of cooperation. Its guiding questions are: Does cooperation offer potential to improve the economic performance of the participating enterprises? Why, when and how should enterprises cooperate? What are appropriate institutions for cooperation?

Findings of the literature from economics reveal that the main reason for one firm to cooperate with other firms is to improve its market position and increase its economic benefits. Any enterprise has to answer the classic question: “Make or buy?” Cooperation is a third option, beyond markets and hierarchies that can increase the opportunities of firms. It can reduce the uncertainties of the market while maintaining the autonomy and flexibility of the organisation, avoiding rigid hierarchies (Etter, 2003).

Understanding inducement and contributions can help to explain the emergence of cooperation (Gocht, 2004; Jonsson, 1986). According to this approach, an enterprise decides to join cooperation individually, if it seems beneficial. In order to maintain cooperation, each partner expects to obtain benefits from it while also having to contribute to it at the same time. Thus, each enterprise cooperates so long as its individual balance of benefits and costs is positive. Simultaneously, the cooperative effort as a whole has to provide sufficient benefits to all members. Cooperation is voluntary and each firm can opt out whenever it has the impression that cooperation is no longer beneficial.

Benefits can be derived through additive cooperation when several businesses join functions or outputs of the same – products, services, supply, etc. – thus reducing costs. This is an interesting option for farmers who are under
pressure to enlarge their business (Hein and Lavèn, 2011). Through comple-
mentary cooperation, each enterprise obtains access to resources, infor-
mation, knowledge, and markets, while also being able to outsource certain
duties and functions (Stein, 2003; Porter and Kramer, 2011). The underlying
rationale here is that cooperating enterprises can perform better on the mar-
ket when each partner concentrates on its core competences. Specialisation
and know-how transfer can speed up product development and contribute to
an acceleration of innovation and its introduction to the market (Woratscheck
and Roth, 2003; Hirsch-Kreiensen, 2002).

On the other hand, cooperation requires resources, and an enterprise has to
invest time and money to start, establish and maintain it. Such costs can be
analysed using the concept of transaction costs, comprised of initiation,
agreement, implementation and monitoring costs for any economic transac-
tions, also including their non-monetary aspects (Etter, 2003, p. 56;
Woratscheck and Roth, 2003).

Moreover, cooperation bears the risk of free riding and defection. An enter-
prise provides information and knowledge without knowing if involved part-
ners will react reciprocally. Monitoring the contributions of partners is difficult,
because also allowing it is voluntary and monitoring mechanisms are expen-
sive. Defection is always possible (Swoboda, 2003). Institutional economics
deals with this problem, and seeks to widen the perspective from a single
enterprise towards the interplay of collaborating enterprises. Institutions, un-
derstood as rules and norms, regulate interaction (North, 1990). They govern
and structure cooperation through, for example, contracts, reciprocal inter-
dependencies and trust and regulate the distribution of costs and benefits
between partners.

Properly working institutions tend to reduce the risk of defection and decrease
monitoring costs, without giving up the autonomy of each enterprise. Accord-
ing to this rationale, common goals are not necessary for cooperation, as long
as each partner evaluates its own participation as being beneficial. However,
coordinated activities on the basis of deliberate agreements are required
(Gocht, 2004, p. 27; Jonsson, 1986).

Summing up these findings, the following insights contribute towards our
framework:

- Individual economic performance is the measure of success for coopera-
tion; partners cooperate as long as their balance of benefits and costs is
positive.
- Independent partners combine complementary resources and compen-
tences in order to promote specialisation and efficiency gains.
- Cooperation needs to generate sufficient resources for re-distributing ben-
efits to all partners.
- Institutions organise interaction within cooperation (e.g. information,
monitoring) and regulate the distribution of costs and benefits.
Operational cooperation management is crucial for efficient interaction, including monitoring.

### 3.1.2. Industrial network sociology

Industrial sociology also focuses on the economic success of an enterprise's cooperation. Building on Granovetter (1973), it considers enterprises as socially embedded and situates the cooperation in a social context, thus building upon findings from network sociology. Strategic cooperation is embedded in a network that relies on social relationships, communication and mutual trust (Weyer, 2011a). Its guiding questions are: How is economic cooperation socially embedded? How to build social capital and to establish trust in cooperation?

Enterprises cooperate in order to achieve economic goals such as accessing new markets or fostering innovation. Each actor brings in specific contributions, and all involved partners join their resources and competences without questioning their autonomy. However, in contrast to economics, approaches from social network sociology stress that social processes going on in networks can have a major influence on the success of cooperation (Etter, 2003). The broader perspective of network sociology combines the analysis of individual actions with understanding the structural embeddedness of individuals, thus considering the possibilities for and constraints on their action (Jansen, 2006) and questioning the narrow interpretation of economics that economic benefit is the only logic of action. Rather, it pays attention to other logics as well, such as norm- or value-oriented, communicative, strategic or solidary action, to better understand the complex dynamics of cooperation. Two functions that neither markets nor hierarchies can provide are described: a) cooperation reduces uncertainties with regard to the behaviour of others, including competitors or partners, (strategic function) and b) it increases the performance of partners (instrumental function) (Weyer, 2011a).

Cultural norms and social capital serve as social "glue" for cooperation. Social capital and social relationships of reciprocity are crucial elements of cooperation and need to be developed in order to generate economic benefits (Sydow, 2010). For example, spatial proximity can be a factor generating trust (Weyer, 2011a). The distribution of costs and benefits needs to be considered as being reasonably fair by all partners. Trust reduces control costs of cooperation and, probably more importantly, inspires and generates commitment towards cooperation.

Power structures within networks shape cooperation (Weyer, 2011a). Two types of cooperation networks can be differentiated. In symmetric networks, members cooperate as more or less equal partners. For example, in regional networks, which can be organised horizontally or vertically, personal relations, informal communication, and a sense of being part of a regional community play important roles. In asymmetric networks, such as strategic or policy networks, partners do not act on an equal base. Strategic networks typically consist of a focal business and a network of suppliers. The focal
business is much more powerful than the other partners. Nevertheless, the suppliers get preferential access to their client through cooperation (Sydow, 1992a).

Powell (1990) stresses that the potential of mutual learning processes can only be realised in trustful relations of partners with more or less equal status. Hirsch-Kreiensen points out a tension between the different logics of economic efficiency and social trust that are both necessary for successful cooperation (Hirsch-Kreiensen, 2002). There is a contradiction between the long-term social processes of trust building and the economic pressure of generating innovation in the short-term. Operative steering is a way of dealing with this tension and the necessity of continuously negotiating and regulating conflicts.

Network sociology contributes the following insights to our framework:

- Besides economic motives, social relationships matter in cooperation. Social interaction, norms, and communication serve as “social glue” for cooperation.
- Social capital, especially building trust through reciprocal behaviour, is a success factor and can reduce transactions costs (e.g. for control).
- Direct communication and transparency can help to establish a trustful cooperation culture that involves all partners.
- Operative steering is a means for coping with the different interests of members and facilitating communication for building trust.
- Operational management needs to cope with the different interests of members and power structures; it is responsible for continuously facilitating communication, negotiating and regulating conflicts.

3.2. **Thematic perspectives on cooperation**

The purpose of our framework is analysis of cooperation for sustainability innovations. This implies additional actors other than enterprises as well as other logics and goals for cooperation that go beyond economic profit, because sustainable agriculture and food production strives for social, ecological and economic impacts. Often, these goods and services are multifunctional, combining private and public goods. For these reasons, two thematic strands of the extant research are considered here: Innovation studies, with a special focus on sustainability, and rural sociology.

3.2.1. **Innovation studies**

Sociological studies on innovation networks as a part of network sociology are the starting point for reviewing this research strand. More specifically, research on sustainability innovations, mostly rooted in economics, is included. Guiding questions are: How does cooperation facilitate the generation of innovations? What are specific characteristics of cooperation for sustainability innovations?
Innovation networks pool resources of different enterprises and facilitate inter-organisational communication and learning (Weyer, 2011b), with special emphasis being put on the importance of rather loose, informal relations (weak ties) for incorporating new information and ideas which are able to generate innovation (Weyer, 2011b). As a consequence, authors who mostly focus on technological innovations point out that innovation often emerges in the intersection and interaction between different schools of thought (Powell and Grodal, 2005, p. 9).

In the 1980s, innovation networks arose as modular decentralised networks, speeding up technical progress in phases of uncertainty and transition (Langlois and Robertson, 1992, p. 301). Especially in the early phases of innovation, trial-and-error learning is an appropriate strategy. Krowohl and Krohn (1995) stress the importance of recursive learning processes in innovation networks and describe them as institutional solutions based on social capital for overcoming innovation blocks. Weyer (2011b) points out that innovation processes pass through several phases of opening and closure in which the direction of technology development is negotiated repeatedly until a product is ready to enter the market. He differentiates between development, stabilisation and implementation phases of the innovation processes.

Against this general background, Fichter (2006, p. 288) defines sustainability innovations as technical, organisational, usage-system-linked, institutional or social novelties which contribute towards preservation of critical natural resources and towards economic and consumption styles which are globally and long term transferable. In line with this definition, a strand of the literature from industrial ecology stresses the necessity for cooperation on material flow management out of primarily ecological motives. Such networks are termed “sustainable value creation networks” (Walther, 2010), “industrial symbiosis” (Herczeg et al., 2013; Chertow, 2007), or “industrial parks” (Saikku, 2006). Other research deals with the generation and diffusion of sustainable products and services (or product service systems) in cooperative efforts between several enterprises and sometimes other actors in “sustainable innovation networks” (Lehmann-Waffenschmidt, 2007; Pfriem et al., 2006).

Kirschten (2006, p. 271) defines sustainable innovation networks as cooperation between more than two actors (from enterprises, research, state and local institutions, civil society) who have a common goal regarding innovations which are oriented towards the vision of sustainable development and link ecological, economic and social novelties. Cooperation in these networks is rather informal, comprises different parts of the value added chain and is characterised by complex and reciprocal exchange and learning processes as well as cooperative rather than competitive behavioural patterns.

Sustainability innovation research differentiates incremental innovations aiming at optimisation of products, services or entrepreneurial processes from radical or system innovations. The latter fulfil needs in completely different ways (e.g. selling services instead of products like car sharing) and often combine product, process and organisational innovations (Lehmann-
Waffenschmidt, 2007, p.57). Radical innovations usually have the potential for greater sustainability effects, but they also tend to be more difficult to establish on the market or in society, since they often require parallel changes of consumer habits as well as adaption of regulations and infrastructure (Grin et al., 2010).

Fichter emphasises the importance of cooperation for the development of sustainability innovations, for the following three reasons. First, such innovations often have a systemic character. Second, vertical as well as horizontal cooperation may foster qualities of “sustainable” or “fair” products along the value chain and position them on the market. Third, sustainability innovations often require a change of consumer attitudes, knowledge and behaviour, which calls for multi-actor-cooperation with users, associations and state institutions (Fichter, 2006, p. 288). Kirschten (2006, p. 270) points out the necessity of cooperation beyond the entrepreneurial context to ensure acceptance and social embeddedness. Hence, a broad variety of actors is needed for sustainability innovations.

Studies on cooperation for (sustainability) innovations contribute the following insights to our framework:

- Heterogeneity of actors assures a broad range of perspectives and inspires sustainability innovations that strive for ambitious holistic qualities.
- Common goals, values and trustful relations provide orientation and motivation, since involved partners strive for more than economic benefit. However, specific sustainability goals need to be regularly (re)negotiated.
- Cooperation in innovation processes is dynamic, with phases of opening and closure each posing specific challenges.
- Operational management needs to integrate heterogeneous actors, facilitate the formulation of common goals, guide highly dynamic processes, and provide a learning arena, including knowledge management.

3.2.2. Rural sociology

Rural sociology explores how rural areas cope with far-reaching changes and transitions (in Europe) and how these changes can be designed in more sustainable ways. Several authors from the field see the necessity for second-order or “radical” innovation, which implies the adoption of new paradigms and rule sets (Brunori et al., 2013; Knickel et al., 2009). Organic agriculture is an example of second-order innovation, since it tries to link up with its local and social contexts, thus challenging the concept of increasing productivity for higher output (Knickel et al., 2009; Schäfer et al., 2016). More recent examples are high quality, low quantity regionally specific products which are fostered by rural networks (Knickel et al., 2009). Based on the observation that this type of innovation process is almost always the outcome of collaborative networks, the guiding questions are: What are particularities and characteristics of cooperation for sustainability innovations in agriculture and food production? What do they mean for cooperation management?
Authors from rural sociology point out that agriculture traditionally is treated as a separate and independent sector, even though it is inextricably linked to ecologies and cultures of place. Marsden stresses the inherent multifunctional role of agricultural systems and their embeddedness into specific environmental and socio-cultural contexts. Therefore, sustainability innovations need to adopt a more integrative, site-specific approach, instead of one-size-fits-all solutions (Marsden, 2012, p. 259); thus, complex networks and webs of viable, often multifunctional businesses play an important role. Schermer et al. (2011) emphasise that, while traditional farmers’ cooperation aimed for economies of scale (additive cooperation), new farmers’ cooperative efforts strive for a holistic notion of quality through complementary cooperation by exploiting specific local resources. Meanwhile, Noe and Alrøe (2010) differentiate a broad range of qualities, such as safety, health, ethics, aesthetics, and rootedness.

Such innovation in the “eco-economy”, as Marsden (2012, p. 263) puts it, goes beyond agro-ecological production and includes processing, marketing and consumption practices as well as establishing links to related sectors as ecotourism, agro forestry and community-based renewable energy production. In contrast to the conventional view, which conceptualises innovation mainly as being embodied in technological artefacts, these scholars deal with innovation as a change in the configuration of hybrid networks. This view implies that innovation is mainly related to resulting patterns of interaction between people, tools and natural resources and places learning at the core of innovation processes (Brunori et al., 2013). In the context of sustainable agriculture, social learning is understood as parallel transformation of cognitive, social and emotional competences, including attitudes and values (Ristet al., 2006). The specificity of learning related to sustainability is that, as a concept and practice, it is understood in many different ways and, therefore, needs to be negotiated (Hermans et al., 2010).

The role of Learning and Innovation Networks for Sustainable Agriculture (LINSA) has been analysed in several European countries (Moschitz et al., 2015). LINSA are understood as “networks of actors experimenting with new practices and ways of doing things” (Ingram et al., 2015, p. 57). Those networks include local administrators, producers, extensionists, customers, NGOs, experts as well as researchers, who are mutually engaged around common goals and supply their diverse knowledge inputs for sustainable agriculture and rural development (Knickel et al., 2008; Brunori et al., 2013). Altogether, they represent a great diversity of available knowledge, covering technical and economic, production- and marketing-oriented, codified and tacit, local and distant, from farmers, experts and others (Moschitz et al., 2015, p. 2).

As a consequence, social network relations are crucial for cooperation (Scherm er et al. 2011). With regard to management of these hybrid networks, a balance between diversity and commonality is needed: great diversity of actors is not sufficient, as they also need to become involved in common activities and aim for common goals. If diversity and complexity are not
balanced with commonality, the network is in danger of becoming unstable (Moschitz et al. 2015: 3). Also, reflexivity is crucial—participants have to steward learning activities, reassess the objectives of innovation and monitor sustainability performance (ibid.), because networks are not static structures but, rather, evolve over time, changing according to variation in actor resources and strategies as well as reacting to outside pressures.

The contribution of rural sociology to our framework consists of the following insights:

- Sustainability qualities in the agriculture and food sector are multi-functional; partners have to define them in site-related and context-specific terms for their cooperative efforts.
- (Social) learning processes and reflexivity are crucial for developing tailor-made solutions with a given set of (regional) actors.
- Stable cooperation requires a balance between diversity and commonality.
- Operational management needs to adapt cooperation to specific regional contexts, networks and requirements.

3.3. Summing up: preliminary findings

Authors within the rich and heterogeneous body of the research strands reviewed here take diverse perspectives on cooperation in general and on sustainability innovations in the agriculture and food sector in particular. Nevertheless, we feel that they complement and extend one another, resulting in a complex concept of cooperation. Based on the above findings, we understand cooperation as voluntary collaboration of independent partners who work together for a specific purpose that they can achieve better jointly than individually. Further, we specify cooperation for sustainable development as horizontal and/or vertical multi-actor collaboration between actors such as enterprises, members of civil-society, public actors or researchers, with the common goal of contributing towards a sustainable agriculture and food sector. A minimum level of organisational and management structures are necessary for successful, stable cooperation, which needs to be based on trust, comprises a reciprocal exchange of resources (e.g. material and financial resources, knowledge, experience), and is characterised by learning and experimenting with new practices. Some findings are coherent across all of the examined strands, such as the importance of fair distribution of costs and benefits, the role of trust or the necessity of operational management. Others may compete or even be contradictory, such as the necessity for common goals or the importance of social learning. Table 1 provides an overview over the relevant characteristics extracted from the literature.
<table>
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<tr>
<th>Research Strand</th>
<th>Important categories for the analysis and management of cooperation</th>
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| **Economics**   | - Individual economic performance is the measure of success for cooperation: partners cooperate as long as their balance of benefits and costs is positive.  
- Independent partners combine complementary resources and competences in order to promote specialisation and efficiency gains.  
- Cooperation has to generate sufficient resources for re-distributing benefits to all partners.  
- Institutions organise interaction within cooperation (e.g. information, monitoring) and regulate the distribution of costs and benefits.  
- Operational management is crucial for efficient interaction, including operational network management, and monitoring of outcomes. |
| **Industrial Sociology** | - Social interaction, norms, and communication serve as "social glue" for successful cooperation.  
- Social capital, especially building trust through reciprocal behaviour, is an important factor and can reduce transactions costs (e.g. for monitoring).  
- Direct communication and transparency can help to establish a trustful cooperation culture that involves all partners.  
- Operational management needs to cope with the different interests of members and power structures; it is also responsible for facilitating communication. |
| **(Sustainability) Innovations studies** | - Actor heterogeneity assures a broad range of perspectives, inspiring sustainability innovations that strive towards achieving ambitious holistic qualities.  
- Common goals, values and trustful relations are important, providing orientation and motivation since the partners strive for more than economic benefit. However, specific sustainability goals need to be negotiated regularly.  
- Cooperation in innovation processes is dynamic, with phases of opening and closure each posing specific challenges.  
- Operational management needs to integrate heterogeneous actors, facilitate formulation of common goals, guide highly dynamic processes, and provide a learning arena that includes knowledge management. |
| **Rural Sociology** | - Sustainability qualities in the agriculture and food sector are multifunctional; partners need to define them to be site-related and context-specific.  
- (Social) learning processes and reflexivity are crucial for developing tailor-made solutions with a given set of (regional) actors.  
- Stable cooperation requires a balance between diversity and commonality.  
- Operational management needs to adapt cooperation to specific regional contexts, networks and requirements. |
4. **A framework for cooperation for supporting sustainability innovation processes in the agriculture and food sector**

In this section, we employ the previously discussed findings from the literature while developing a comprehensive framework intended to facilitate analysis of a broad variety of cooperative efforts supporting sustainability innovations in agriculture and food production. One challenge here is to differentiate between cooperation in general and cooperation for supporting sustainability innovations. We presume that cooperation is, a priori, neutral towards sustainable development and may serve different goals, including unsustainable ones. We address this problem stepwise by, first, elaborating on the general characteristics of cooperation and then, second, specifying them more precisely for the purposes and requirements of sustainability innovations. Our framework builds on conceptualisations of alternative food networks from Holloway et al. (2007) and Venn et al. (2006). Further, although Schermer et al. (2011) sketched out characteristics of newly emerging farmers’ cooperation for marketing, a holistic framework for cooperation supporting sustainability innovations in the agriculture and food sector is still lacking.

Based on the findings of the above literature review (see table 1), we differentiate between three dimensions for the description and analysis of cooperation: First, regarding the **structural** dimension, the literature emphasises the importance of goals, actors and functions of cooperation. Second, findings related to the **operational** dimension stress the role of the management of cooperation and operational steering with regard to organisation, processes, and communication. Third, in terms of the **temporal** dimension, the literature describes cooperation – especially in innovation processes – as dynamic and changing its character over time. For this reason, we distinguish between four phases of cooperation: initiation, development, realisation, and transformation. These constitutive characteristics of the framework are described below.

**4.1. Structural dimensions of cooperation**

At the structural level, three categories – goals, actors and functions – were identified from literature as the main characteristics of cooperation, described in more detail in the following subsections.

**a) Goals of innovation and motives for cooperation**

Economics assesses cooperation only from the perspective of economic profit. Common goals for cooperation are not considered as being necessary, because the main motivation is the individual economic profit of each partner (Gocht, 2004). In contrast, findings from innovation studies and rural sociology stress the importance of shared goals. Actors who want to contribute towards sustainable development provide public or collective goods, possibly in combination with private goods. They cannot assume that they will be able
to capitalise these public goods completely on the market and receive revenues from them.

While economic benefits and financial revenues are a strong motive for cooperation in general, sustainability innovations also require common sustainability goals as drivers for cooperation. Therefore, partners need to negotiate common goals for their particular sustainability innovation and agree on the specific sustainability qualities they want to create and provide. On this basis, they can come to a conclusion regarding whether and why cooperation is needed and how it can positively contribute towards these goals. From engaging in this process, they can derive which actors, resources, and competencies are required to meet their goals. A possible result of this negotiation could also be the parties agreeing that cooperation does not seem appropriate.

The analytical questions to be posed regarding goals and motives include:

- What is the guiding (sustainability) vision of this particular innovation?
- What sustainability qualities are to be generated and provided to whom in order to solve what sustainability problem(s)?
- How can cooperation contribute towards reaching this goal? What partners are needed, and what resources should they bring into the cooperative effort?

b) Actors and their resources

The role of actors within cooperation is undisputed across all strands of the literature. However, gathering together an appropriate mix of actors is a challenge. Economics proposes that partners in additive cooperation join functions or outputs of the same type using economies of scale. In complementary cooperation, each partner brings their core competencies as supplementary resources, including information, knowledge, and market access, so that each partner can concentrate on their strengths.

Innovation studies emphasises that a diversity of world views and capacities – derived from diverse individuals as well as a broad range of organisations – is needed to create holistic sustainability qualities. Meanwhile, rural sociology shows that partners bring in necessary resources, such as labour power, time, knowledge, ideas, social power, networks, market access, and reputation, that are needed to generate specific agreed-upon sustainability qualities. Moreover, partners may provide financial means or develop alternative forms of financing that may compensate for market disadvantages induced by the provision of public goods.

While loose ties and heterogeneity inspire the creation of innovative sustainability solutions, commonality –underpinned by shared values and compatible organisational cultures –can stabilise cooperation and facilitate interaction, as industrial sociology points out. Further, actors need to be selected according to functional purposes and the capacities they could bring in for their cooperation with each other. Cooperation along the whole value chain has
proven to be essential for the provision of complex goods and services, because it helps to ensure integrative problem solving which may lead to the avoidance of unintended side-effects. A lack of key actors in the value-added chain or in the regional setting may affect the whole network (Kirschchen, 2006). Rural sociology points out that, within a regional context, a given and regionally limited set of actors needs to provide the necessary qualities for a particular cooperative effort.

Analytical questions regarding actors and their resources include:

- What actors, with complementary competences and resources (also for financing the provision of public goods), are needed to reach the goals of a particular cooperative effort?
- Do the involved actors (individuals and organisations) represent a broad range of sustainability perspectives? Are some necessary actors lacking?
- Is there sufficient commonality between the partners that can support cooperation management?

C) Provision of sustainability qualities and distribution of costs and benefits

For analytical reasons, it may help to distinguish between the level of the overall cooperation and the level of the individual partners. At the overall level, cooperation is successful when it generates and distributes the aspired-for sustainability goods and services. Economics mainly elaborates on this vital aspect of cooperation. Each partner needs to contribute their specific resources and capacities to this goal, and these contributions need to be coordinated through cooperation management. As it is voluntary, and partners may opt out whenever they like, cooperation needs to provide benefits for each partner and, at the same time, additional revenues to provide management capacities, meaning here costs for operational steering and network management. Economics deal with this balance between individual profit and costs of cooperation management in purely economic terms.

With regard to sustainability innovations, this balance becomes even more complex and the criteria for success are broader. The provision of public goods is independent from the economic benefit of individual cooperation partners. At the same time, all involved partners need sufficient resources to be able to fulfil their obligations. This is of special relevance for enterprises in the agriculture and food sector that have to compete in a food market where other market players do not produce public goods or even externalise costs.

The challenge is how to finance the provision of sustainability qualities – either through the market (e.g. higher prices for consumers) or through other forms, such as public money from subsidies, taxes, fees or private money from donations, funds, or sponsoring. Sometimes a mix of different sources of financing might be a viable option. Cooperation might bring forth solutions
for this question; however, the reviewed literature hardly provides us with any answers.

At the individual level, in order to contribute to the common goals, cooperating enterprises need revenues from the cooperative effort they are involved in. As the transaction costs approach shows, these revenues do not always have to be monetary, as reputation, market access or knowledge may also compensate for the efforts made. Non-profit organisations may even bring in additional resources to the cooperation because they are interested in the outcome. The assessment of costs, risks and benefits for each individual cooperation partner is actually very difficult and resource-intensive to undertake. Thus, the research literature (e.g. industrial sociology) pragmatically concludes that all partners need to perceive the distribution of costs and benefits as fair.

Analytical questions related to the costs and benefits of cooperation include:
- Does the overall cooperation result in the intended sustainability qualities?
- What resources does each partner contribute to the common goal and how?
- What is the benefit for each partner? What are the mechanisms to assess and to distribute costs and benefits across the cooperative effort? Does each partner consider it as fair?
- How is the provision of sustainability qualities financed, by whom? How are “prices” made regarding the extra efforts required for achieving sustainability qualities?

4.2. Operational dimension of cooperation

The literature on cooperation stresses the importance of operational steering. While the structure is decisive for the direction and effectiveness of cooperation, operational steering is responsible for efficient use of resources made available by partners. The existing conceptual literature is rather general about operational steering of cooperation; therefore, additional findings from the management literature is considered in this section in order to specify the framework with regard to operational questions and link it up with more practical considerations.

Different authors stress the challenge of establishing and stabilising collaboration in entrepreneurial networks (e.g. Koller et al., 2006; Hirsch-Kreinsen, 2002; Sydow, 1999). Sydow (2001, p.92ff) describes the organisation of networks as a “management of tensions”, since it is necessary to balance autonomy versus dependency, trust versus control, cooperation versus competition, flexibility versus specificity as well as stability versus change. The challenge of managing entrepreneurial networks has been analysed from a variety of perspectives, such as institutional economics (e.g. Picot et al., 2003; Gerybadze, 2004), structuration theory (Sydow, 1992b; Windeler, 2001) and industrial sociology (e.g. Hirsch-Kreinsen, 1997). Koller et al. (2006) claim
that there is still a research gap regarding success factors for the operational steering of corporate networks. Our framework stresses three primary aspects of the operational dimension: structure, operational steering, as well as communication and cooperation culture, as outlined in the following subsections.

d) Structure of cooperation

The cited management literature points out that the relationships between cooperation partners and their interactions need to be organised and structured in order to reach their goals efficiently. Consequently, cooperation requires a minimum level of institutionalisation. According to institutional economics, rules structure interactions by, for example, assigning responsibilities, regulating division of tasks, and guaranteeing accountability. Such structuring institutions require agreement between cooperation partners, which can vary between informal implicit understandings and formal written contracts.

A further aspect of organisational structure is how cooperation deals with power relations. In hierarchical business networks around focal enterprises, there is clear power imbalance, though dependent partners can be compensated via economic benefits and market access. However, in cooperation for sustainability innovations, power imbalances may impede trustful, productive interaction. Organisational structures may contain counterproductive power imbalances.

Finally, cooperation requires some sort of management structure that governs decision making within it, which requires approved responsibilities and sufficient financial means and resources for its work, preferably with a specific budget for operational management. These structures vary between loose and flexible agreements and formalised regulation via contracts. The appropriate cooperation structure for a given case depends on the specific tasks and phases of cooperation involved.

Analytical questions regarding cooperation structure include:

- Is there an agreement on the structure of the cooperation?
- Has network management for cooperation with clear tasks been established?
- How is cooperation management and operational steering financed?
- Are there rules for the potential exit of partners?

e) Operational steering

Given an organisational structure, operational steering of the daily tasks of cooperation requires a broad range of competencies and skills. Kirschten (2006, p. 284-285) concludes that professional and committed steering is necessary which especially disposes of communicative and other key competencies (moderation, project management, acquisition of funding, selection and consulting of members etc.). The overall task of operational steering is
to facilitate collaboration with regard to ongoing operations, such as decision-making processes, work planning, scheduling, and the provision of interfaces between partners and processes. Further, operational steering needs to find a balance between opening and closure of the actor constellation within a cooperation process that is dynamic and changes over time.

As it is neither possible nor efficient to regulate every detail of cooperation beforehand, one important task of operational steering is moderation, conflict management and balancing between the divergent interests of involved actors. Assessment of operational steering is difficult, however, so a pragmatic form of judging its success is finding out whether involved partners view the organisational structure and operative steering as being efficient.

Analytical questions related to operational steering include:

- Is the operational steering facilitating collaboration?
- Does the steering monitor whether the partners provide the promised sustainability qualities?
- Are the goals and performance of the cooperative effort evaluated regularly?

**f) Communication, cooperation culture and knowledge management**

As cooperation is a complex and multifaceted process, with interactions that are mainly intangible and difficult to assess, its operational steering needs to go beyond a command and control structure. Communication and social capital “lubricate” cooperation, and the reviewed literature reveals that the generation of trust is a central characteristic for successful cooperation. Trust develops more easily in face-to-face relations and is expressed in the expectation that higher involvement of one partner in the medium run will be balanced by reciprocal efforts of the other partners in the long run (Granovetter, 1985; Powell, 1990). From the perspective of sustainability innovations, Fichter (2006, p.290) emphasises the role of reciprocal trust, personal relations and compatible cooperation cultures in sustainable innovation networks. He introduces the term “innovation communities” to draw attention to informal processes of interaction, questions of collective formulation of goals and mutual processes of understanding. The cohesion and stability of a network can only be generated by regular interaction, which makes personal meetings indispensable.

Three tasks can be distinguished here. First, operational steering needs to organise internal and external communication. A communication concept can make communication more consistent, transparent and predictable for both partners and external actors. Second, trust building is essential for establishing a cooperation culture where partners trust in the reciprocal commitment of all partners. Trust grows through mutual interaction and respectful relationships on an equal footing. The task of operational steering is to balance between heterogeneous actors and provide arenas and moderation for interaction, in order to mitigate rivalry and facilitate productive communication.
Ideally, it should foster mutual esteem and generate team spirit. Mutual reliability is likely to be achieved more easily between partners with a similar culture and shared basic values. Third, knowledge production is often a very important function of cooperation. Thus, knowledge management helps to identify knowledge gaps, secure produced knowledge, generate new knowledge jointly, and address knowledge gaps and missing competencies via, for example, training, qualification, and consultancy.

Analytical questions related to communication include:

- How is internal and external communication organised?
- Do partners trust each other? Does cooperation management implement measures to improve trust building?
- Is there a common entrepreneurial culture? Does a team spirit exist?
- Do the partners share their knowledge and expertise? Do they engage in co-production of knowledge? Is newly generated knowledge secured and made available to all partners?

4.3. Temporal dimensions: phases of cooperation

Cooperation is a dynamic process, as the literature from innovation management indicates: changing orientation, functions, and structure over time (Weyer, 2011b). In order to analyse its dynamic nature, several stages or phases of cooperation need to be distinguished. For this, we refer to the model from Koller et al. (2006), which differentiates between four phases (initiation, development, realisation, and transformation) for analytical reasons, while being aware that the process of cooperation is dynamic and recursive and its phases cannot always be clearly distinguished.

1) Initiation phase

At the beginning, an idea for a sustainability innovation emerges within a group of potential cooperation partners. This initial situation is highly volatile and dynamic, and a core group of actors constitutes the nucleus of an emerging cooperation network. They formulate an overarching guiding vision for the targeted sustainability innovation and sketch preliminary goals for their cooperation (http://wir-kooperieren.org). On this basis, partners consider whether cooperation is useful to reach these goals or not. If so, requirements for cooperation are deduced and specified. At the same time, the core group searches for suitable partners who can bring in necessary resources. At this stage, detailed rules or contractual agreements are not yet necessary, as trust is the basis for interaction. Also, a clear distribution of expected costs, risks and benefits is not possible during this phase, but the partners presume that their cooperative effort will strive to achieve fair distribution. In this phase, the main task of cooperation management is fostering communication and exchange of ideas in order to identify and to align possible partners with complementary resources and competencies as well as common goals in a way that strategies, structures and organisational cultures can fit into well.
2) Development phase

Here, the sustainability innovation becomes concrete and the collaborating partners define how they intend to generate and provide sustainability qualities. The organisational and personal structure of the cooperation is more precisely shaped, and the degree of institutionalisation increases. The actor coalition becomes more stable, as new entrants are selected according to functional requirements. This comprises binding goals for the cooperation and preliminary modalities and structures for cooperation that specify a distribution of tasks, allocation of responsibilities, and decision-making rules. Mandatory regulations or even contracts are arranged and operational management is established. Costs, risks, and benefits are described, and rules for their distribution are sketched out but are still fuzzy. More important is the expectation of involved partners of mid-term benefits or successful provision of sustainability qualities. The main task of operational management during this phase is communication and implementation of the cooperation structures.

3) Realisation phase

By this phase, the innovation has been established and the cooperative effort now continuously generates and markets sustainable goods and services (depending on the innovation). Management of the cooperation includes planning and decision making, facilitation of the processes and production, internal and external communication, as well as monitoring. The cooperation structure has been institutionalised; the costs, risks and benefits of each partner have been assessed; and the modes of distribution are considered to be fair by all partners.

4) Transformation phase

By this point, the regular operation of the cooperative effort is revised from time to time when framework conditions change, including markets, regulations, public discourses or the constellation of the cooperation itself. Crises in cooperation are an occasion to reconsider its goals, partners, and structure. The result of these crises and changes can be a restructuring, re-invention or even dissolution of the cooperation. In order to prevent avoidable crises, regular reflection on the cooperation and its management is a possible means towards positive adjustment.

4.4. Overview of the framework for cooperation

The framework that we have developed for analysing cooperative efforts consists of key thematic characteristics and temporal aspects of cooperation. A matrix (see table 2) combines six thematic dimensions with four temporal phases (Koller et al., 2006; Wodja et al., 2006), and central characteristics are allocated to those phases in which they play a key role. The matrix seeks to provide a systematic overview of structures and processes typical of cooperation. It is intended to guide analysis of specific cases of cooperation, to
reveal links and interfaces between their different functions and characteristics, with the goal of identifying their main challenges.
Table 2: Integrative framework of key characteristics and phases of cooperation

<table>
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<tr>
<th>Phase</th>
<th>a) Goals of innovation and motives for cooperation</th>
<th>b) Actors and their resources</th>
<th>c) Provisions of sustainability qualities and distribution of costs and benefits</th>
<th>d) Structure of the cooperative effort</th>
<th>e) Operational steering and network management</th>
<th>f) Communication, cooperation culture and knowledge management</th>
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<tr>
<td>1. initiation phase</td>
<td>Clarify objectives of the innovation and need for cooperation; formulate guiding principle/mission of cooperation</td>
<td>Identify suitable partners and attract them for cooperation; watch out for good mixture of partners</td>
<td>Level of cooperation: describe costs and benefits Level of individual organisation: distribution fuzzy-relational but perceived as being fair</td>
<td>First ideas regarding structure of the cooperation</td>
<td>Efforts for initiating cooperation (contacting partners, moderating discussion about objectives, initiating measures for generating trust); conflict management if necessary</td>
<td>Informal (internal) approaching of potential partners (high level) Measures for trust building Development of a cooperation culture</td>
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<tr>
<td>2. development phase</td>
<td>Level of cooperation: Determine distribution of inputs and outputs / costs and benefits Level of individual organisation: Describe costs and benefits, draft of distributional rules perceived as being fair</td>
<td>Concept for the structure of the cooperation Distribution of tasks, decisional rules Power relations are clear ( \rightarrow ) first contractual agreements</td>
<td>Efforts towards cooperation development: accompanying the structuration process, suggestions for managing the cooperation Conflict management if necessary</td>
<td>Stabilise communication via transparent design, integration on the functional and expert level, building trust and motivation Develop appropriate manner of management and communication</td>
<td></td>
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<tr>
<td>3. realisation phase</td>
<td>Level of individual organisation: Determine costs and benefits Monitor of a) Qualities of the cooperation, b) Costs and benefits of partners</td>
<td>Cooperation contract is signed Gradual adjustment of the structure Design of operational procedures: provision of sustainability qualities Monitor compensation of efforts Moderation and conflict management Mode of financing the cooperation is established</td>
<td>Establish internal and external systems of communication Measures for establishing a cooperation culture Establishment of knowledge management</td>
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<tr>
<td>4. transformation phase</td>
<td>Check objectives and vision: adjust Check if there is a lack or abundance of partners Check the distributional rules: Are they perceived as being fair? Do the partners benefit from the cooperation? Check the cooperation structure: Is it appropriate, effective and efficient?</td>
<td>Evaluation of operational processes Continual moderation and conflict management</td>
<td>Check communication flows Check cooperation culture Develop knowledge management further</td>
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For each characteristic, the most relevant phase is highlighted in grey.
5. Discussion

In this paper, we have developed a comprehensive framework for analysing cooperation for sustainability innovations in the agriculture and food sector. This framework integrates findings from different strands of the research literature, building on grand theories in the social sciences, such as institutional economics or network theory on conceptual disciplinary thinking, including industrial network sociology and sustainability innovation models; on empirical studies of cooperation in rural sociology; as well as on cooperation management.

The framework consists of thematic and temporal dimensions, with several categories for analytical research as well as for practical purposes. We propose that six key attributes characterise cooperation for sustainable agriculture and food production. The first three attributes – goals, actors, distribution of benefits – are content-related, defining the orientation of the cooperative effort and its intended output. Thus, they are decisive for the expected sustainability outcomes and effects of cooperation. The other three attributes – structure, operational steering, and cooperation culture – are associated with cooperation management and effectiveness.

Even though these attributes are based on current research, the perspectives of diverse disciplines are not unanimous, and their assessments diverge in a number of ways. As a consequence, this has required our own interpretation with regard to defining goals and actor orientation of cooperation in order to sharpen the framework. As noted above, cooperation goes beyond dominant functional motivation of actors promoted in the economics literature. Social and cultural factors, such as trust, are an integral part of cooperation, especially in agriculture and food production where regional value chains and relationships play a key role because environmental, social and economic effects are partially place-based. Regional collaboration draws on a given set of possible actors, which makes it highly context-specific.

Sustainability innovations are also confronted by competitive disadvantages in comparison to conventional food production that externalises costs. Enterprises and organisations providing sustainability qualities have to somehow compensate for these disadvantages. However, the reviewed research strands hardly address the problem of financing innovations that generate private and public goods. Cooperating partners may have different interests in these goods (e.g. farmers want to market their products, whereas environmental organisations care about biodiversity or landscape conservation). It is difficult to remunerate extra efforts to generate sustainability qualities that do not pay off at the market, to assess the monetary and non-monetary effects of the innovation, and to estimate the value of non-monetary benefits (e.g. improving image). Cooperation may offer solutions for such problems. It may include partners who appreciate sustainability qualities (organic production, animal welfare) and are willing to pay higher prices or provide other forms of financial compensation. These can be realised in producer–consumer cooperation or partnerships with public or private organisations (e.g. local
communities, NGOs, foundations). We assume that innovations in sustainable
land management can only succeed on the market, at least in niche markets,
when they generate additional financial compensation through, amongst
other means, cooperation.

Operational management facilitates the exploitation of synergies of working
together, which is crucial for efficient cooperation. However, in the complex
reality of actual cooperation, it is often confronted with a dilemma: it can
either optimise the provision of sustainability qualities or the stabilisation
of market position. To find a balance between these competing goals is a difficult
task for cooperation management. It is faced with the trade-off between
building social capital (trust), which takes time, and fostering rapid innovation
cycles for economic purposes in order to compete in dynamic markets
(Hirsch-Kreinsen, 2002). Moreover, cooperation management needs to sup-
port involved partners without overstraining them, especially small enter-
prises and non-profit organisations with scarce personnel and financial re-
sources. As a consequence, the balance between economic optimisation and
providing holistic sustainability qualities requires specific skills, but such sus-
tainability networks often do not dispose over sufficient financial resources to
invest in highly qualified staff.

Summing up, our framework seeks to provide orientation for a broad range
of research strands by drawing upon the following strengths:

- It frames the outcomes or success of cooperation much more broadly than
economic profit alone by including contributions to private and public
goods promoting sustainable development. As a consequence, success of
cooperation has to be redefined according to the specific context and site
conditions of the agriculture and food sector.

- The provision of sustainability qualities, often co-products of private and
public goods, is a complex task. The framework is sensitive to the im-
portance of common goals and trust because they can help to overcome
conflicts over the assessment of outcomes and redistribution of costs and
benefits.

- So far, the extant research has hardly addressed the question of how sus-
tainability innovations in the agriculture and food sector can be financed
and who could bear the costs. Cooperation might be one option, as pro-
ducers, users and funders may collaborate for sustainable development.
This may widen motivation for cooperation, which itself brings forth new
requirements for actor constellations and operational management.

- The framework specifically addresses cooperation in the agriculture and
food sector. Agricultural production is place-based and dependent on the
planetary boundaries of natural resources (Rockström et al. 2009). As a
consequence, sustainable development has to be defined as being con-
text-sensitive and site-specific, and the range of cooperating actors can
be locally or regionally restricted. Cooperation management needs to be
able to deal with such restrictions.
Finally, the framework points out some limits of cooperation, such as actors and their competencies might not suffice to solve sustainability problems, the costs for providing sustainability qualities through cooperation can be too high, allocation of costs and benefits may be too complicated or perceived as being unfair, cooperation structures may not be functional, operational management maybe inefficient, or cooperation management may not be capable of building trust. Actors tend to underestimate the costs of cooperation. Sometimes, this veil of ignorance may even help them to become engaged in working towards sustainable development. In any case, sufficient resources for cooperation and its management are needed. These considerations form the base for possible cancellation criteria for cooperation.

Finally, the framework focuses on the (internal) management of particular cooperative efforts and, thus far, does not systematically consider the role of framework conditions. This is a drawback, but it lies beyond the scope of this paper to address this concern. The governance literature may inspire such conceptual advancement of the framework and provide hints regarding how to cope with this challenge (Marsden, 2012).
6. Conclusion

Summing up, our framework indicates that cooperation is a potential foundational stone for the provision of innovations that integrate social, ecological and economic goods and services in the agriculture and food sector. Our findings have emphasised the twofold function of cooperation. On the one hand, it can help to integrate diverse actors along a value chain as well as bring together different types of knowledge, interests and competencies in order to generate sustainability benefits and internalise negative effects. On the other hand, cooperation may compensate market disadvantages and stabilise the economic positions of involved partners. This might be achieved by including partners who accept paying higher prices or providing additional compensation. This can be considered as being a crucial step towards achieving a sustainable food economy where producers and consumers can share responsibilities and accept higher, respectively truer, prices for better sustainability performance, at least in a niche market.

The framework is intended to address researchers who are involved in practice-oriented research as well as practitioners so as to make cooperation a useful element for innovators in this field. For this reason, it will be implemented, empirically tested and refined for practical purposes, within the context of the ginkoo research project, in two case studies, one about ethical poultry production and the other about new utilisation schemes for cultural landscapes. The framework is intended to build a basis for developing a cooperation management tool further on in the project.
7. Acknowledgements

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8. Literature


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