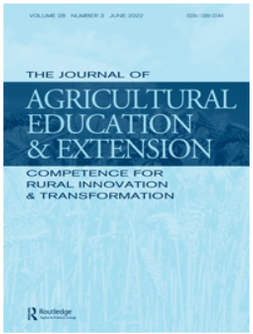

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Developing agri-food value chains: learning networks between exploration and exploitation

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ABSTRACT

Purpose: The present study explores the development of agri-food value chains from an organizational learning perspective, using the German organic food sector as an example. We illustrate how the development of local value chains unfolds over time and outline how facilitation can support this process.

Design/methodology/approach: The study used an action research design to facilitate change in practice and to create new knowledge. Data were collected through qualitative interviews, participant observation, and documentation of workshops and other learning activities. Data analysis and conceptualization followed a grounded theory approach.

Findings: The development process of value chains occurs in three phases, from joint exploration of the problem, through a phase of experimentation and implementation, to further cultivation of established collaborations among value chain actors. The development process oscillates between intra- and inter-organizational learning as well as explorative and exploitative activities.

Practical implications: The results of this study can help to understand and to further professionalize the practice of value chain development and provide guidance for facilitators and other stakeholder working in this field.

Theoretical implications: By drawing on the theory of exploration and exploitation, the study enhances the understanding of value chains collaboration in an inter-organizational setting. The study conceptualizes the development of agri-food value chains and the role of facilitators in the process.

Originality/value: There is little research to date that considers the development of value chains as a collaborative learning process. The presented grounded theory of local value chain development may inform further research on the transition towards a more sustainable agri-food system.

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1. Introduction

Innovations in regional food systems are increasingly in the focus of agricultural policy makers. Examples include the EU Farm to Fork strategy[1] as well as the EU Organic Action Plan and its corresponding policies in member countries,[2] all of which acknowledge local food production and shorter supply chains as drivers for more sustainable agricultural systems. Close geographical and social relations between value chain actors are expected to generate innovative products and processes with environmental and social benefits, stimulate new business models, and support rural development (European Commission 2015).

The present study focuses on the development of value chains that connect small and medium-sized farms and other food enterprises within a regional food system. In such 'midscale food value chains' (Stevenson et al. 2011), the members of the value chain work together to bundle, process, and distribute their products through distribution channels that can handle substantial volumes, e.g. public catering or local retail. The members act collectively and prioritize shared values – both with regards to values embedded in their products, e.g. organic production, and the values associated with the relationships among business partners, e.g. the fair distribution of profits (Lev and Stevenson 2011).

The development of sustainable value chains in the agri-food sector is a complex problem, for which there is no blanket solution (e.g. Peterson 2009). Value chains differ depending on regional market conditions, the capabilities of the companies involved, and the types of products. At the same time, developing a value chain is a social process, in which participants from different companies have to consolidate their individual interests and goals in terms of inter-organizational collaboration (Gray 1989; Huxham and Vangen 2005; Schruijer 2020). These negotiation processes are complex and highly ambiguous, as they occur at different levels simultaneously – among individuals, within individual companies, and among the various companies of the value chain. The processes are also often complicated by a lack of formal structures, as responsibilities, roles, and rules still need to be formed within the emerging collaboration (Huxham and Vangen 2005).

In the German organic agri-food sector, for example, these issues have been addressed by creating new specialized consultant roles, often incentivized by public funding programs. In Germany, such consultants support the development of value chains at organic farming associations, in regional development initiatives, or at research institutions, e.g. as part of agricultural innovation projects such as EIP-AGRI.[3] In their respective organizations, these consultants are referred to as value chain managers, marketing consultants, or regional networkers, for example. For the study presented here, we chose the term 'value chain developer'. It is derived from the understanding that, similarly to organizational developers, value chain developers support organizations in change and learning processes (e.g. Schein 1988). Different from organizational developers, however, their work does not only focus on individual organizations, but rather on developing vertical and horizontal collaborative relationships among multiple companies within the value chain.

Value chain developers can be seen as facilitators who support collaboration among value chain partners. Such facilitators help groups to work effectively together. They

are largely concerned with social interaction or processes rather than primarily with the content or task of the collaboration (Schumann 1996). Facilitators are specifically employed in inter-organizational contexts to support collaborative processes, such as problem solving and decision making that transcend the boundaries of a single organization (Gray 1989; Gray and Purdy 2018; Huxham and Vangen 2005; Schumann 1996).

In the context of agricultural extension and innovation, individuals and organizations acting as facilitators are commonly referred to as innovation intermediaries (e.g. Ingram et al. 2020; Klerkx and Leeuwis 2009). According to this understanding, agricultural extension activities go beyond the traditional transfer-of-knowledge model (Landini et al. 2017; Nettle et al. 2018). Intermediaries support farmers and other stakeholders of the agri-food system in co-innovation processes by facilitating exchange of knowledge and experiences among them (Ingram et al. 2020).

Thus far, there has been little research on how value chain developers actually facilitate complex change processes in practice. Previous research has shown, however, that a company's ability to learn and adapt plays a major role in organizational change processes (e.g. Argyris and Schön 1996; Holmqvist 2003; Moschitz et al. 2015). Drawing on the theory of organizational learning, we present value chain development as a process of knowledge co-creation. Using the organic food sector as an example, we explore the questions of (1) how value chain developers operate, (2) how the development of local value chains unfolds over time, and (3) how learning takes place in collaborative relationships among actors of a value chain.

2. Value chains as learning networks

The concept of the value chain according to Porter (1985) describes the sequence of value-adding activities in the production of goods. Today, this value chain often involves multiple companies that act together towards a given target. In the current study, value chains are regarded as learning networks. This term is analogous to the concept of the 'learning organization' (Senge 1990), i.e. an organization that effectively facilitates the learning of its members and is thus able to adapt and to better respond to challenges. The learning network of the value chain involves multiple companies and the individuals within these companies who learn together in order to optimize the organization of value creation. According to Peterson (2002, 2009), this ability to co-create new knowledge, in the sense of organizational learning, is a prerequisite for efficient and adaptive value chains.

The theory of organizational learning is based on an understanding of learning that transcends the mere transfer of knowledge in a specific field. According to the definition of Argyris and Schön (1996), learning takes place in organizations when the members of an organization encounter problems in their work, which then prompt them to review, adapt, or fundamentally question existing action patterns and ideas. Organizational learning means that the knowledge thus gained and practices changed have become part of the collective practice of the organization (Argyris and Schön 1996).

Taking a more applied perspective on organizational learning, March (1991) distinguishes between two categories of learning activities: exploration and exploitation (Figure 1). Exploration includes activities that involve seeking new opportunities or creating new knowledge; exploitation, on the other hand, describes the optimization of

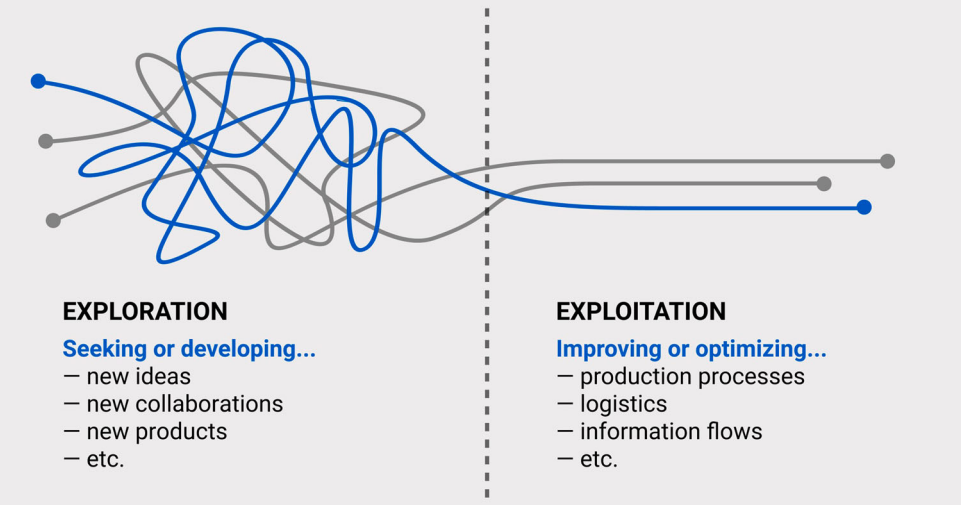

Figure 1. Examples of exploration and exploitation.

existing routines. These two categories represent different strategies in organizational development. Exploration is associated with high uncertainty and geared towards long-term change and innovation. Exploitation, in contrast, aims to better manage established processes and to improve their efficiency.

The theory of organizational learning is not limited to the observation of learning within a single organization but has increasingly included networks and other inter-organizational contexts (e.g. Coghlan and Coughlan 2015; Lavie et al. 2010; Knight 2002). Both exploration and exploitation can, therefore, occur within a single organization or between multiple organizations who work together. Value chain development is an example of an organizational learning process where exploration and exploitation transcends the boundaries of individual organizations. In value chains, several companies set out to jointly develop new ideas, products or processes (exploration). Once they have found a way to create shared value, they work to make better use of it, for example by optimizing the flow of goods or information between the companies involved (exploitation).

According to March (1991), learning organizations should seek to strike a balance between exploitative and exploratory activities to ensure lasting and sustainable success. Organizations who focus too much on exploitation and do not invest enough into exploration may achieve short-term success through optimization but risk losing their ability to innovate and adapt in the long run. In contrast, organizations who focus too much on exploration run the risk of losing their way in the process of generating ideas. A company's ability to act in a manner that is both adaptive and efficient, i.e. to pursue both exploitation and exploration, is referred to as organizational ambidexterity (Tushman and O'Reilly 1996). There are several modes, in which exploration and exploitation can be balanced to achieve ambidexterity, e.g. by temporal separation, where the focus shifts over time from exploration to exploitation and vice versa, or by organizational separation, where different organizational units focus on either exploitative and exploratory activities (Lavie et al. 2010; O'Reilly and Tushman 2008). Contextual

ambidexterity describes the ability of members of an organization to switch between exploration and exploitation depending on the situation (Gibson and Birkinshaw 2004).

3. Research design

In this study, an action research approach was used to support and explore the learning processes inherent in emerging agri-food value chains. The present paper draws on qualitative data to conceptualize these processes and the practices of the facilitators who support the value chain development. The action research approach integrated a grounded theory analysis following an iterative, abductive process of data gathering and analysis (Figure 2). It was aimed at conceptualizing the gradual unfolding of emerging value chains in the context of organizational learning theories.

Action research is an orientation towards knowledge creation that brings together practice and research in a collaborative learning process. In action research, researchers collaborate with stakeholders affected by a real-world problem to find practical solutions and, in the process, generate a better understanding of the problem for both academia and practice (e.g. Bradbury 2015, Shani and Coghlan 2019). In contrast to researchers in more positivist research approaches, action researchers take an active role, e.g. as a facilitator or consultant for the practitioners they work with. By doing so, the researchers are not neutral observers but actively engage with the problem through interventions (Huxham 2003). Action research is often used as an umbrella term for a range of approaches that have different emphases, for example, in terms of what role the researcher has, how practitioners participate, and how new knowledge is generated (Argyris and Schön 1989; Schein 1995; Shani and Coghlan 2019).

The present paper aims to conceptualize knowledge about a specific phenomenon that was derived from the learning process in an action research study. It follows Huxham

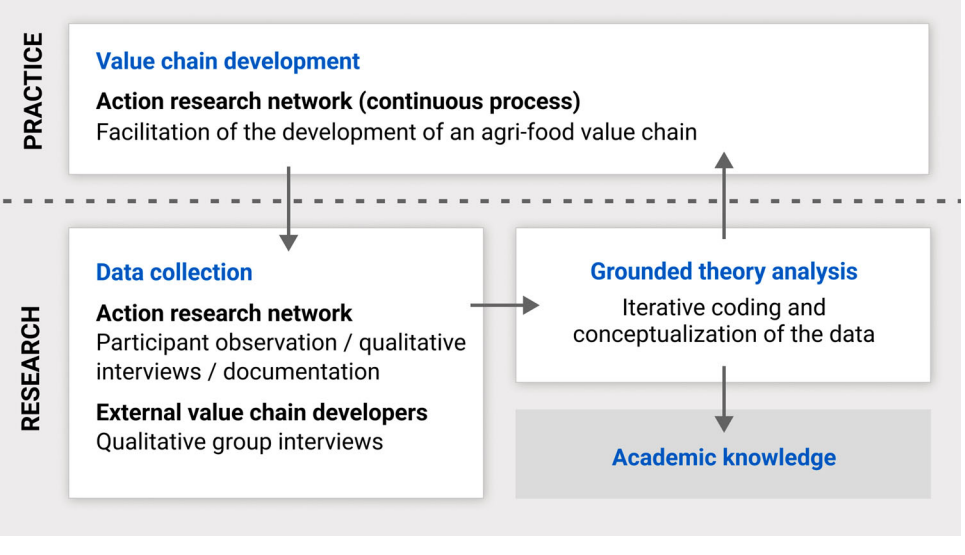

Figure 2. Research design.

(2003) who places a focus on collecting rich data and developing theory from action research. In this sense, action research is understood as a methodology for studying organizational processes and practices, comparable to case study research and ethnography (Eden and Huxham 1996). Theory generated from action research is 'grounded in action' (Susman and Evered 1978; Eden and Huxham 1996) because it is derived from rich data that emerge from the actual behavior of people in real-world situations. The interaction between researchers and practitioners through consecutive interventions also allows the output of research to be validated and refined in practice (Huxham 2003).

3.1. Action research setting: the learning network

In the present study, the action research approach was employed in the context of an emerging value chain for organic vegetables in the Berlin-Brandenburg region over a period of four years. In the region, there is a high demand for local and organic food but structural issues in the agri-food system prevent local actors from using that potential, especially in the vegetable sector (e.g. Braun et al. 2018; Doernberg et al. 2016). Compared to surrounding regions, the cultivated area is relatively small and there is little coordination between the actors of the organic vegetable sector. Also, the mid-sized marketing channels necessary to bring local organic produce into retail and public catering are little developed (Braun et al. 2018).

The study involved building a learning network of about 20 agri-food practitioners (farmers, food processors, and traders) who worked together with researchers, facilitators, and agricultural consultants to overcome the challenges described. The group of practitioners included, for example, farmers seeking better distribution channels or planning to diversify their operations, but also processors and traders interested in the local sourcing of organic produce (Braun et al. 2021). From 2018 to 2022, the network was funded through the EIP-AGRI program.

The learning process was supported by a four-person facilitation team consisting of academic researchers and staff from an advocacy group for organic agriculture. The team brought together people with professional backgrounds in practical agriculture, food economics, agribusiness, and communication sciences, some of which had additional qualifications in group dynamics and coaching. The first author of the present article worked as an action researcher in the facilitation team and was actively involved in the strategic planning of the process as well as the practical facilitation of learning activities.

Over the course of the project, the facilitation team established two main strands of activities. The focus of the first strand was to improve professional practice through various extension activities, including individual mentoring and consulting, farmer field schools, and other group-based learning methods. In the second strand, participants worked on building concrete value chain collaborations. Together, they developed visions and ideas for value chain activities and worked to implement them in practice. These activities led to the formation of a joint enterprise and other partnerships among value chain actors, and has improved vegetable production and logistic infrastructure in the region.[4]

The research is similar to other learning networks in the EU that support innovation in small and medium sized food enterprises, e.g. through an 'action learning' approach

(Coghlan and Coughlan 2015; Coughlan et al. 2021; Rigg et al. 2021). Such learning networks host activities where participants learn together, explore issues, and create new knowledge that they later implement in their own organizations. In contrast to these other learning networks, however, the focus of the present action research was specifically on the development of value chain collaborations among practitioners within a region. The inter-organizational learning process was aimed not just at improving the professional practice of participants, but also at creating an environment where negotiations and informed decision making can take place to establish practical collaborations among value chain actors.

3.2. Data gathering

The data collection took place throughout the duration of the study. Data were gathered through qualitative interviews, participant observation, and documentation of workshops and other activities in the context of the learning network (Table 1).

Qualitative interviews were conducted using a semi-structured interview guide that was created and adapted for the particular topic and interview situation. Interviews with value chain practitioners were conducted face-to-face or by telephone and lasted 45 minutes to 2.5 hours. In workshops, meetings, and other learning activities, field notes were taken to document the setting, the topics discussed by participants, the decisions taken, and other observations by the researcher. These situations were also recorded to later clarify information and be able to draw on verbatim quotes. In addition, flip charts, pinboards and other notes were photographed. The material was further supplemented by field notes on informal conversations, for example, during field trips or in telephone conversations with practitioners.

Additional data were collected during internal activities of the facilitation team, such as workshops and meetings serving to plan and reflect on interventions in the learning process. This included weekly meetings, which lasted 1–1.5 hours each, and quarterly workshops, which lasted 1–2 days and were partly supported by external

Table 1. Overview of data collected.

Data collection	Source and materials	Details
Data collected while working with value chain practitioners	Qualitative interviews (audio transcripts) Participant observation (field notes) Workshop and meeting documentation (video and audio recordings, photos, and other material) Records of informal conversations during learning activities, as well as phone and video calls (meeting minutes, field notes)	3 workshops for network building (2017–2018) 2 business development workshops with farmers (2018–2019) 32 business meetings, workshops, and other activities with groups of value chain practitioners (2018–2021) 12 in-depth interviews with individual practitioners (2019) and 3 group interviews (2020–2021) for evaluating and reflecting on the processes
Data collected during planning of and reflection on interventions (facilitation team)	Records of conversations during phone and video calls (meeting minutes, field notes) Workshop and meeting documentation (field notes, photos, and other material)	Weekly meetings of the facilitation team (2018–2021) Quarterly planning and reflection meetings, externally moderated (2017–2021)
Data collected from external value chain developers	Qualitative group interviews (audio transcripts)	5 in-depth group interviews with a total of 17 value chain developers (2019)

facilitators. These activities were also documented through field notes and meeting minutes.

Through the insider position in the facilitation team and the participation in the day-to-day work with practitioners, rich and in-depth data could be collected, which otherwise would not be accessible for research. Knowledge generated on the basis of such data is, however, specific to a particular situation, the actors involved, and the respective context (Coghlan 2011). Huxham (2003) suggests to combine data collected in an action research setting with other data in order to support theory building. Therefore, to broaden the view and to validate results from action research, the present study also included data from interviews with additional value chain developers.

From March to October 2019, five in-depth group interviews were conducted with a total of 17 value chain developers who support emerging value chains in various regions of Germany. Thirteen women and four men from different value chains were interviewed, including the meat, cereals, dairy, fruit, and vegetable sectors. Potential interview partners were identified via media coverage and via the websites of relevant institutions. Their job descriptions had to be related to the facilitation of value chain development in the organic agri-food sector. Contacts were made by calling or emailing the potential interviewees individually. The group interviews were conducted either in person or via conference call following a semi-structured interview guide. They took between 1.5 and 2 hours each. These interviews sought to capture the value chain developers' practices from their own perspective. The interview questions addressed activities as well as competencies that help with facilitating change processes in the respective value chains.

3.3. Data analysis

The study employed grounded theory analysis as a research methodology to systematically generate theory from action research through abduction in an iterative process of data gathering and analysis (Corbin and Strauss 2015, Richardson and Kramer 2006). Grounded theory analysis is widely used in research into social practices and processes in organization and management studies (Langley 1999), including agri-food business research (Bitsch 2005; Peterson 2011). At the core of grounded theory analysis is the process of constant comparison, where researchers look for similarities and differences in data (Corbin and Strauss 2015). This process moves back and forth between data collection, coding, and conceptualization of categories.

Throughout the study, data were systematically reviewed and organized. This included verbatim transcription of interviews as well as review of field notes and other material collected in workshops and meetings, such as photos or flipchart sheets. The raw data were then broken down into text fragments which were labeled and annotated in a process known as open coding. As the analysis progressed, new codes emerged, codes were combined, renamed, and deleted through comparison between new data and existing codes. In the next step, conceptually similar codes were grouped into categories and continuously refined.

The coding and category building was supported by ATLAS.ti (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany), which is a software tool that helps researchers with managing qualitative data, and with organizing the codes and categories

identified in the process (Friese 2014). Furthermore, visual mapping techniques with paper cards and pinboards were used to arrange categories and identify relationship between them. In this way, for example, it was possible to uncover patterns in the practices of value chain developers or to chronologically organize categories that map the value chain development process over time.

Insights from the data analysis were then brought together with relevant concepts from the literature on organizational learning. From the combination of existing theoretical concepts with empirical data results an improved understanding of the phenomenon under study (Gehman et al. 2018). The insights gained in this way were regularly cross-validated with other members of the facilitation team and were thus fed back into the planning of further activities of the learning network.

4. Results and discussion

The following results present the practice of value chain developers and provide insights into their professional background (4.1). This is followed by a presentation of the collaborative learning process that is inherent in value chain development and a discussion of the role of value chain developers in specific phases of this process (4.2.). Section 4.3 focusses on how intra- and inter-organizational learning occurs during this development process. In the following sections, the term value chain developers refers to both the facilitation team of the learning network and the external value chain developers who were interviewed.

4.1. Practices of value chain developers

The value chain developers perceive themselves as supporting farmers and other food businesses in building value chains. They work alone or in small teams, for example, in regional development initiatives or for organic farming associations. In their professional practice, they bring together value chain actors from a specific region and create a social space in which these actors can work in a collaborative innovation process. By organizing and facilitating regular activities, value chain developers enable the actors to build trust, to identify potential for collaboration, and to develop concrete partnerships along the value chain (Braun et al. 2021). The practices identified in the data can be categorized as belonging to different levels (Figure 3): Value chain developers build networks, organize collaborative change processes within these networks, and facilitate the group activities that constitute the change processes.

On the network level (level 1), value chain developers can be understood as intermediaries that bring together farmers, food businesses, and other actors of the agri-food system (e.g. Ingram et al. 2020; Klerkx and Leeuwis 2009). In some cases, they build on existing networks, such as those of organic farming associations. In addition to establishing an environment, in which actors regularly meet, value chain developers, or the organizations they work for, provide network members with resources, such as access to specific advisory services and project infrastructure, and they handle communication with stakeholders outside the network. In the literature, such intermediaries have been described as 'process intermediaries' (Kivimaa et al. 2019a) or 'innovation intermediaries' (Klerkx and Leeuwis 2008). This part of the work of value chain developers is related to

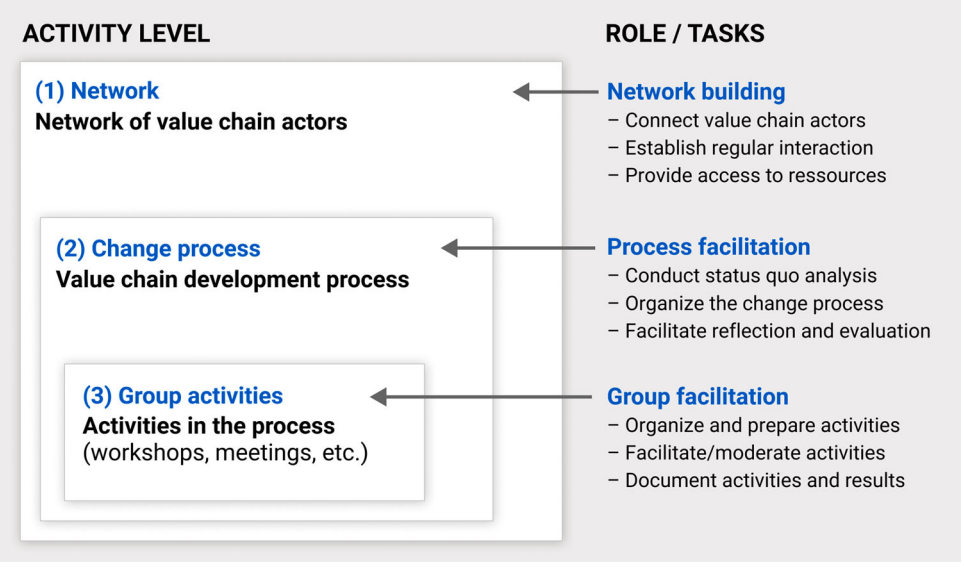

Figure 3. Activity levels of value chain developers.

the paradigm of agricultural extension that focuses on knowledge exchange and co-creation among practitioners (e.g. Landini et al. 2017; Moschitz et al. 2015). In contrast to other intermediaries in agricultural extension, however, the focus is specifically on the co-creation of knowledge as a vehicle for building the necessary capacity for value chain collaboration, in the sense of (inter-) organizational learning and development.

Within the networks, value chain developers organize and facilitate change processes (level 2). Their work can be related to 'process consultation' as defined by Schein (1988, 1995), where a process facilitator acts as a consultant supporting people or organizations in exploring their issues and leading them through a series of interventions that positively change their situation. In the process consultation model, the facilitators are not traditional consultants applying expert knowledge to solve a problem for a client. Rather, they organize an iterative process, in which people or organizations work to generate the knowledge needed to overcome their problems (Schein 1988). Value chain developers support agri-food practitioners in developing a mutual understanding of the problems specific to their value chain, which they then use to develop and implement their own solutions. As facilitators, value chain developers are neutral conveners who provide targeted interventions that support the process (Gray 1989; Schuman 1996). They described that they often have to clarify this third-party role to the value chain actors they work with. A value chain developer explained her stance in the process as follows:

> I design the environment in which the group can work together, but I don't make any economic decisions. This responsibility lies with the companies. My role is to create a process, to provide space for ideas that are born from practice, to discuss them, and to develop strategies together [with practitioners] on how to implement them. That's where I see my mission. (Member of the facilitation team, in a planning meeting, 2017)

The change process is driven by meetings, workshops, and other activities in which value chain actors come together (level 3). The value chain developers prepare and

facilitate these activities, and document the results. In this role, they help to find common goals, to lead negotiations, to bring about decisions, and mediate in conflicts. They use various methods to generate ideas, develop strategies and reflect. A value chain developer reports:

> I trained as a coach, which is also something I have grown to appreciate greatly. As in, bringing this set of methods to the table during process facilitation. To not only moderate a group meeting, but also to explore the methods I can use to drill down deeper, so that everyone gets as much as possible out of these meetings. (Member of the facilitation team, in a reflection workshop, 2019)

This work has been conceptualized as group facilitation (Berry 1993; Gray and Purdy 2018; Stewart 2006). Stewart (2006) argues that group facilitators need a specific set of competencies: Group facilitators combine communication skills (e.g. questioning, active listening) and other interpersonal competencies (e.g. maintaining focus, encouraging participation) with process management (e.g. planning, managing visual aids) and certain personal characteristics (e.g. self-awareness, sense of humor). They also need to be able to understand their clients' business environment and group culture (Berry 1993). This is largely consistent with how the interviewees describe the competencies that help value chain developers do their jobs. Like group facilitators, they combine the methodological and social competencies needed to organize and facilitate meetings and workshops with knowledge of the field. They report that a professional background in agriculture and food economics as well as a general understanding of agri-food value chains is needed to do their work. In addition, they need to be able to relate to the practitioners' day-to-day situations, speak their 'language', and preferably have a personal connection with the region.

> I studied nutrition and food supply management. It's a bit of a mixed degree program, in which you study everything from agriculture to marketing, really. Also, food technology, and so on. It helped me a lot to understand the chain. And what also helps me in my communication with the farmers is that I was lucky to be born into a family of farmers myself. (Value chain developer, cereals value chain, in a group interview, 2019)

The data show that the practical problems the value chain developers are working on, as well as the solutions they develop together with value chain actors, greatly depend on each individual case. There are, however, certain recurring themes, such as groups of farmers who are looking for ways to process their produce, downstream actors in the value-adding process seeking to source organic raw materials regionally, and a lack of logistics to bundle goods within a certain region. Value chain developers support practitioners in facing these different challenges.

With regard to the challenges of their own role, value chain developers mentioned the complexity arising from the large number of actors they work with and their different interests and goals. They need to create an environment of openness and trust, in which the value chain actors can collaborate in a joint process of learning and problem solving. In this regard, Gray and Purdy (2018) highlight the importance of understanding group and intergroup dynamics for facilitating large group interventions. Also, the development of value chains is associated with a high degree of ambiguity and uncertainty, as each solution must be individually designed with the actors of the specific value chain and is based on their needs and capabilities. As facilitators of group

interventions, value chain developers need to engage the actors of the value chain in an iterative knowledge co-creation process that is twofold. It aims both to build consensus among actors and to bring together diverse expertise to solve problems together (Gray and Purdy 2018, Huxham and Vangen 2005). In the process, value chain developers handle many different tasks that require a wide range of professional competencies. The study showed that interdisciplinary teams can help to meet this challenge, as can networks of outside experts who can be brought in to address specific problems that go beyond the facilitation of the process, including legal or technical issues.

The role of a value chain developer is relatively new. Many of the interviewees are the first to hold that position in their respective organizations and, as a result, their responsibilities are still emerging. The present research also shows that, at times, the value chain developers' work environment fails to recognize the complex tasks and efforts involved in value chain development, especially when success only sets in after months or even years of work.

4.2. Exploration and exploitation in value chain development

According to the experience of value chain developers, their projects are usually long-term engagements with durations of up to five years. In the data, a large spectrum of activities was identified, which are presented here in a three-phase process (Figure 4). The analysis suggests that value chain development usually begins with an exploratory phase in which the stakeholders develop a common understanding of the problems and develop ideas for solutions. This is followed by a phase of designing and experimenting, which involves testing solutions in practice and gradually fine-tuning them. In the third phase, the collaboration is perpetuated, a suitable organizational structure is established and the participating companies continue to work on optimizing their processes and products. The transitions between the phases are fluid, and, depending on the status quo of the value chain, there may be a stronger emphasis on either exploration or exploitation.

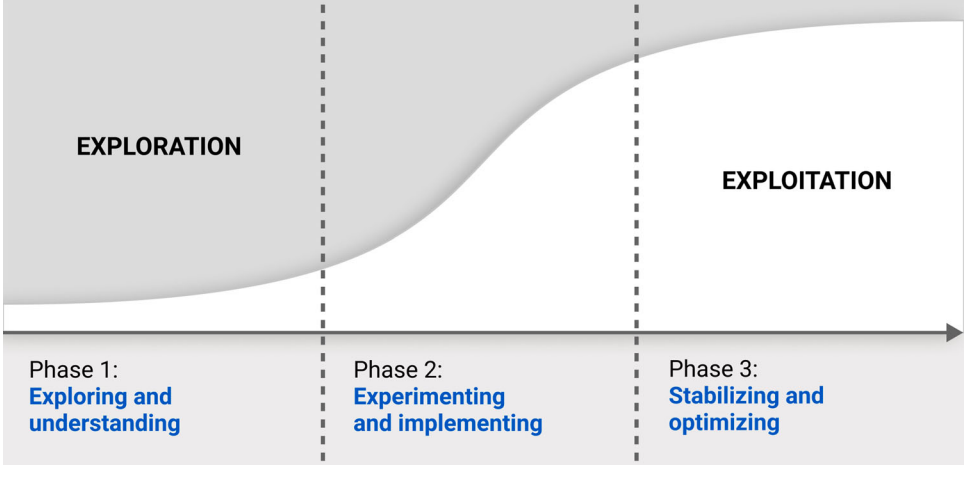

Figure 4. Phases of value chain development.

This breakdown into phases is similar to earlier observations about the work of intermediaries or facilitators in change processes. Gray & Purdy (2018) describe a life-cycle model for multi-stakeholder partnerships that has four phases, from convening a group of participants, over negotiation and implementation of agreements, to an institutionalization of the partnership. Schermer et al. (2010), in a study of facilitation in rural development, describe a very similar three-stage process (forming the group, building a network, institutionalization and handover). Also, in a literature review on intermediaries in sustainability transitions, Kivimaa et al. (2019b) condense multiple existing categorizations into a process model with three phases. Their process begins with a predevelopment and exploration phase, followed by an acceleration and embedding phase where structural change begins to emerge, and ends with a stabilization phase where the transition is complete or a new process cycle begins, depending on the context. The present research develops a more specific process model of value chain development. The results relate the activities in each phase to the concepts of exploration and exploitation, in the sense of organizational learning (March 1991).

4.2.1. Phase 1: exploring and understanding

The first phase primarily focusses on exploratory activities that serve to establish new contacts among local value chain actors, to create a common understanding of the market situation, and to develop ideas. Through collaborative learning, study participants explored the value chain's challenges and potential, discussed their individual needs and expectations, and negotiated common goals. The value chain developers interviewed also emphasized the importance of getting to know each other personally and establishing trust among the participants in this process. The following comments provide insights into the activities of this phase:

> First, it's about initiating things, initiating conversations. That's really the very first thing. Of course, there has to be an idea at the beginning. What are we going to do? Then it's about connecting the various partners. That's a crucial element. It's not just about talking about common goals and negotiating, but it's also about relationships really, which need to be developed. That is to say, getting to know each other and building a trusting relationship, etc. It's something that may take some time. That's the kind of networking that is required. (Value chain developer, cereals value chain, in a group interview, 2019)

> We're all about organic meat processing and marketing. We have a lot of livestock farms in our region. […] That's why there was a demand now from the farmers: we need organic slaughter facilities in the region. That's where I come in then as a regional manager [facilitator in an intermediary organization]. Ok, there is the demand from the farmers and I find out what we can do about it. That is to say, who is involved? What does the situation actually look like along the chain? (Value chain developer, meat value chain, in a group interview, 2019)

At the beginning of the process, relevant actors were identified in order to develop a network of potential value chain partners. In some cases, value chain developers were able to build upon existing networks, such as regional working groups of organic farming associations. Value chain developers connected local stakeholders and organized meetings or workshops to create a social space where they could meet and exchange

ideas. Depending on the situation in the value chain, the process already had clearly defined goals at this stage, or they still needed to be negotiated by the actors.

4.2.2. Phase 2: experimenting and implementing

The second phase contains both explorative and exploitative elements. When describing the activities of this phase, the value chain developers spoke of 'developing', 'trying', or 'testing' as well as 'improving' and 'adapting'. Activities included sounding out areas of collaboration and discovering how the objectives may be achieved by building on existing production, processing, and marketing structures of the participating companies, or identifying where new structures needed to be developed for this purpose. In addition, test runs or practical trials were described, as illustrated by the following example:

> The farmers had a bit of a trial period in advance. Who registers the animals at the slaughterhouse? When will they be slaughtered? Who transports the animals when, how and where? […] Who processes them further? Who writes the invoices? How are the farmers paid? And when and how does it arrive [in the supermarkets]? There was a certain run-up […]. And since then, [the product] has actually been available in various [supermarkets]. (Value chain developer, meat value chain, in a group interview, 2019)

In addition, this phase involved the development of specific practical knowledge. Value chain developers identified needs for specific training and other agricultural extension activities. They set up conversations with external experts, for example, to gain expertise in production techniques, to develop marketing concepts or to clarify any legal issues that emerged during the development of collaborations:

> I actually also see very clear boundaries [for specialized subjects]. You have to purchase knowledge and I see that as part of the process, when you get to the point, for example, where you discuss setting up companies together or concluding contracts. Then, external expertise has to be brought in to ensure that more specialized questions that have arisen in the group may actually be dealt with properly. (Value chain developer, vegetable value chain, in a group interview, 2019)

Value chain developers helped the actors to negotiate the terms of their collaboration, make decisions, and generate commitment for joint enterprises. This part of the process revealed which stakeholders were willing to participate in a closer collaboration within the value chain and to take on responsibility in the long term. Value chain developers described cases in which projects failed or participants left projects at this point of the process. This may also be considered part of the learning process, as actors started to recognize which types of collaboration along the value chain held potential for their companies and which did not.

4.2.3. Phase 3: stabilization and optimization

In the third phase, the focus is on exploitation, i.e. on the efficient fulfillment of the value chain's tasks. The companies involved in the value chain work actively together in production and marketing. They have established a suitable organizational structure and made investments into their joint enterprise. The change process now focuses on the incremental improvement of products, processes, and collaboration over time.

The value chain developers described that at this stage, they 'passed the baton' and had largely withdrawn from facilitating the value chains. Their role was usually limited to a

few consultations or meetings to reflect on current developments. One value chain developer summarized her role during this phase as follows:

> Our goal was to market 25 lambs per week. Meanwhile, we have achieved this […]. The participants in the value chain are communicating very well with each other. I attend the annual meetings and we have a look at what have they achieved in the previous year? What went well? What didn't go so well? What would we like to change? And that's what we are doing at the annual meetings at the moment. Apart from that, this value chain does not need any external help at the moment, rather, it has organized itself in a way that it can manage itself now. (Value chain developer, meat value chain, in a group interview, 2019)

In the beginning of the process, the focus is on the exploratory side of organizational learning to create a shared understanding of the issues at hand and enable practitioners to make informed decisions. It is about behavioral change by challenging existing practices but also the underlying values and assumptions as described by Argyris and Schön (1996). Value chain developers support this phase by facilitating activities of inquiry und reflection (Senge 1990). Later, the focus is more on stabilizing and optimizing emerging rules, structures, and practices of value chain collaboration, which can be explained as exploitation. A value chain that has reached this phase has matured from a rather loose network of individual actors to a joint enterprise with established operational processes. For facilitators, this is also a transition to new roles or responsibilities. They moved on to facilitate a new change process, or, in some cases, they continued to work with the established value chain in operational management or leadership capacities.

4.3. Ambidexterity in value chain development

In emerging value chains, there is not just a shift from exploration to exploitation over time, there is also an interplay between both modes of learning at different organizational levels. Organizational learning takes place both within the participating companies (intra-organizational) and in the interaction of the companies along the chain (inter-organizational). One value chain developer described this dependency as follows:

> I have to keep an eye on the individual practitioners' issues and at the same time focus on the common goal and strategic direction [of the value chain], i.e. I have to keep switching between the bird's eye view and the frog's eye view. (Member of the facilitation team, in a reflection workshop, 2019)

Based on results from the present action research study, value chain development can be understood as a learning process represented by four quadrants (Figure 5). In the action research case, the process began with exploratory activities, both on an inter- and intra-organizational level. The focus was on activities that helped value chain actors to reflect on their individual business situations and practices, in order to prepare them for strategic decisions with regards to value chain collaboration. This was followed by a strategy process at the inter-organizational level lasting several months. In this process, the participants developed a common understanding of the situation in their local market and explored potential areas of collaboration. With regard to intra-organizational exploitation, the value chain actors worked on improving production methods and operational processes within their companies, which was supported by specific training and consulting activities. At the inter-organizational level,

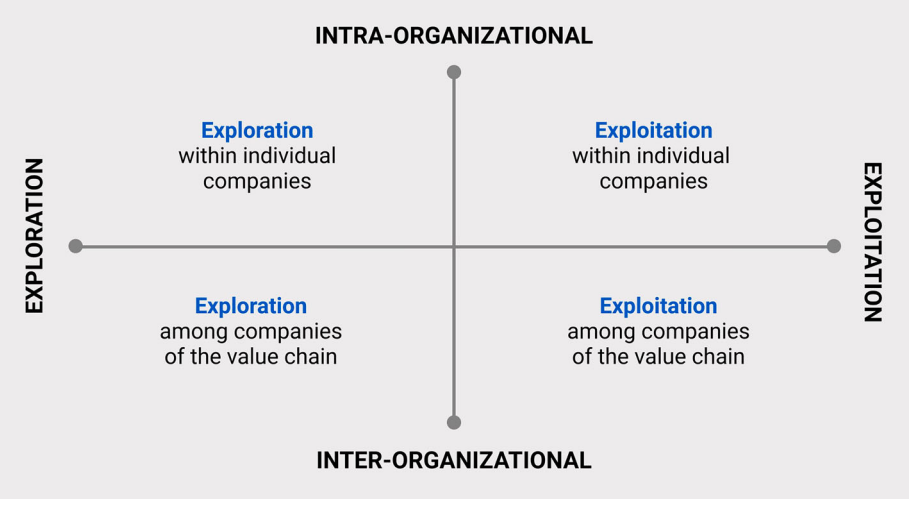

Figure 5. Four quadrants of a learning value chain.

they formalized their collaboration by formally establishing a joint enterprise. They also worked to better coordinate their production planning, and to improve logistics along the chain.

Value chain developers need to consider all four quadrants, support them with appropriate activities, and create transitions between them. Thus, value chain development is not just about network building, ideation, and experimentation (exploration). It is also crucial to move the process towards focus, stabilization, and optimization (exploitation) at the appropriate time, and to understand which steps are necessary in the individual companies (intra-organizational) and for the entire chain (inter-organizational). The continuums between exploration and exploitation and between intra- and inter-organizational learning can be understood as a sliding scale on which the value chain developer chooses the right combination of activities depending on the situation of the chain.

Intra- and inter-organizational learning are mutually dependent and intertwined throughout the learning process. Holmqvist (2003) describes this interdependency as a cyclical process that oscillates between exploration and exploitation, occurring simultaneously both within and between collaborating organizations. Other authors have used the notion of learning 'away' in contrast to learning 'at home' to discuss the relationship between intra- and inter-organizational learning in learning networks (Coghlan and Coughlan 2015; Coughlan et al. 2021). According to that notion, the learning network provides the 'away' setting where exploration can take place, to be later exploited 'at home', primarily within the individual organizations (Coughlan et al. 2021). In value chain development, however, the result of inter-organizational learning is particularly evident in both exploration and exploitation, through an increased level of collaboration and ultimately the institutionalization of value chain structures. Current research on agricultural supply chains also highlights the particular importance of both joint exploration and joint exploitation for innovation, involving a diversity of actors across the whole chain (Labarthe et al. 2021).

When a value chain can switch efficiently between exploration and exploitation, it can be related to be what O'Reilly and Tushman (1996) call an ambidextrous organization. In the value chains investigated, ambidexterity was temporally separated, because shifts occurred over time. However, interviewees also described situations; in which contextual ambidexterity (Gibson and Birkinshaw 2004) was required – when value chain actors simultaneously engaged in exploration at the inter-organizational level and in exploitation at the intra-organizational level. In such cases, value chain actors were faced with the challenge, for example, of optimizing their current production while also thinking about the future of the value chain and developing new products and processes. As described by Turner et al. (2017) and Labarthe et al. (2021) in earlier studies, intermediaries or facilitators can promote such strategic ambidexterity and thus the innovative capabilities of value chains.

5. Conclusions

This study conceptualized the development of agri-food value chains through the lens of organizational learning. The process of value chain development is presented in three learning phases, from exploring the problem together, followed by a phase of experimenting and implementing, to perpetuating the collaboration. In this process, intra- and inter-organizational learning as well as exploratory and exploitative activities are intertwined. The results are based on data collected in the German organic sector. However, the learning process presented here may also be applied to value chains in other related sectors, for example in sustainable bioeconomy value chains.

Value chain developers are intermediaries who create a structured process in which companies forge collaboration through knowledge co-creation. They act as catalysts when value chains are unable to organize on their own. This work requires expert knowledge of the context of the specific value chain as well as methodological and social competencies in the sense of group facilitation (Berry 1993) or process consultation (Schein 1988). Value chain developers design learning activities together with stakeholders and align the activities with the needs that arise in practice. It is crucial for value chain developers to strike a balance between explorative and exploitative activities and to understand in which phase of the development process a value chain is at a given point in time. They facilitate emerging value chains with the aim of building strategic ambidexterity and, more generally, innovative capacity.

The results suggest that new extension practices need to be considered in the context of the socio-ecological transformation of the agri-food system. It is essential that the training of those who support the development of value chains as facilitators or advisors includes these new aspects of their professional practice. Higher education for professionals in the agri-food sector should also include competencies that help to understand and shape collaborative change processes, such as interpersonal skills und process competencies to manage complex and ambiguous situations. Aspiring value chain developers might want to consider additional qualifications that provide such competencies, for example, through training in organizational development, group dynamics, or related fields.

For the agri-food sector as a whole, it will be important to create awareness for this kind of work and to provide adequate funding for process facilitation in emerging

value chains, in addition to more traditional agricultural extension. Many of the challenges facing the agri-food system today are complex problems that need to be addressed through collaborative learning. They require practitioners to challenge existing practices and to explore new, context-adapted solutions based on the co-creation of knowledge rather than simply relying on expert advice.

Several local value chain initiatives in Germany and other European countries that have emerged in recent years will face the challenge of perpetuating collaborative learning, as value chain developers are often only involved temporarily. To be successful in the long term, value chains need to develop structures that support exploration and optimization among value chain actors permanently (e.g. Coghlan and Coughlan 2015; Peterson 2009). It, therefore, remains to be seen how those value chains can continue to innovate and to maintain the ability to be both efficient and flexible – as learning value chains in times of change.

Notes

1. The Farm to Fork strategy is a mission statement for future policy in the European Union towards a fair, healthy, and environmentally friendly food system (European Commission 2020). It is part of the European Green Deal, which aims to make the European Union climate neutral by 2050.
2. Building upon the Farm to Fork strategy, the European Organic Action Plan aims to increase organic farming in the European Union to reach 25% organic land by 2030. It details a range of measures to boost the organic agri-food system, e.g. by supporting local and small-scale food processing and short supply chains (European Commission 2021). In Germany, for example, the 'Organic Farming – Looking Forwards' (Zukunftsstrategie Ökologischer Landbau) of the federal government defines a similar political framework to boost the German organic agri-food sector. It also includes policies directly related to establishing organic value chains (Federal Ministry of Food and Agriculture 2017).
3. EIP-AGRI is a financial instrument of the European Union (EU) and is short for European Innovation Partnerships to improve agricultural productivity and sustainability. It supports multi-stakeholder initiatives to foster sustainable innovation.
4. A detailed description of the learning activities and their outcomes is available in Braun et al. (2021).

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