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# Examining proximity factors in public-private collaboration models for sustainable agri-food system transformation: a comparative study of two rural communities

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Collaboration among local actors is considered an important precondition for a sustainable transformation of the regional agri-food system. To date, however, little is known about the social innovation capacity of local farmers when it comes to the establishment of alternative food networks. This is especially true for farmers' collaborations with local government officials, which are becoming increasingly important in establishing sustainability-oriented markets for local products and services, especially in the agricultural sector that is often rooted in rigid logics, supply chains and institutions. Therefore, this paper aims to explore the concept of proximity as an analytical lens to understand private-public collaboration models that aim at facilitating sustainable transformation in rural areas. Drawing on concepts from innovation geography, this paper considers the influence of geographic, cognitive, institutional, organizational and social determinants of collaboration, enabling an evaluation of the social innovation capacity of local private and public actors. This theoretical approach helps to disassemble and differentiate social innovation processes to determine success strategies. The paper studies two rural communities where mayors aim to establish local food stores with regional products and, therefore, seek collaboration with local farmers. While the empirical aspect of the study is limited, the two cases provide an opportunity to test the theoretical framework. The proximity approach can be significant for regional agri-food system transformation and steering social innovation processes by considering the distinct capacities of actors. Our conclusion is that the examination of the absence and degree of proximity facilitates a better understanding of practical recommendations to promote agri-food system transformation.

## KEYWORDS

alternative food networks, local farmer, short food supply chain, double mission, hybrid organizations, local governance, agri-food transformation, social innovation

## 1. Introduction

The sustainable transformation of the agri-food system is an urgent and challenging task because of its significant implications for global warming, nutrition, biodiversity and environmental degradation (Jungbluth and Demmeler, 2005; Schwarzenbach et al., 2010; Willett et al., 2019). The current prevailing agri-food system, long and still promoted by national and transnational public and private actors, has focused on ensuring sufficient food supply, resulting in rigid institutions, including the domination of a few agribusinesses worldwide (Gugerell and Penker, 2020). Sustainable transformation requires disrupting these rigid institutions to develop new practices (Olsson et al., 2014; Ziervogel et al., 2016). Researchers and policymakers are exploring various transformative pathways for the agri-food system, such as the adoption of bioeconomy (Friedrich et al., 2021), organic farming (Darnhofer, 2014), digitalization (Martens and Zscheischler, 2022; Zscheischler et al., 2022) and agroecology (Vicente-Vicente et al., 2023) to address these challenges. These approaches emphasize the need for innovation and particularly the emergence of new sustainable practices and organizational models to promote change.

Many studies suggest that systemic change has to transcend the narrow focus on technological innovation that has largely ignored the influence of society on innovation processes and their potential negative outcomes (Pol and Vile, 2009; Bock, 2012). Instead, change comes with new organizational models and particularly multi-actor initiatives, referred to here as social innovation (Blätzel-Mink et al., 2017; Chiffolleau and Dourian, 2020; Gugerell et al., 2021; Kump and Fikar, 2021). Successful social innovation is the result of a collective action process that introduces new practices to address social needs (Bock, 2016; Pel et al., 2020; Martens et al., 2021). Scholars have argued that collective action can help actors to lower the barriers toward adopting more sustainable practices and, thus, fostering sustainable transformation (Bodin, 2017; Hubeau et al., 2017). Consequently, collective action and sustainable transformation in agri-food systems rely heavily on people's capacities to initiate or cocreate processes of collective action. So far, collective action aiming at transforming agri-food systems has been identified mostly in urban civil contexts and related to new multi-actor initiatives, such as food councils or food hubs (Blay-Palmer, 2009; Mansfield and Mendes, 2013; MUFPE, 2015; Blay-Palmer et al., 2016; Doernberg et al., 2019). Another example of alternative food networks are new forms of direct interaction between consumers and farmers, such as community-supported agriculture, which are also mostly initiated by urban civil society and link urban and rural areas (Opitz et al., 2019; Zoll et al., 2021). Consequently, there is little research on how rural municipalities are preparing for agri-food system transformation.

In this paper, we will focus on the collective capacities of two related actor groups that have been rarely investigated as agents for strategic agri-food system transformation: rural local government representatives (mayors) and local farmers. The relationship between politicians and market actors (i.e., farmers) has predominantly been characterized by a clear functional division for decades: the public sector sets the framework conditions for the agri-food systems on a macro-scale; farmers and supply chain actors operate within the framework. However, more and more transnational and national governments in the global North are promoting the relocalization of agri-food systems as a strategy for sustainable transformation

(Hinrichs, 2003; Gava et al., 2018), which also puts the focus on local governments to address this issue and develop policies to meet the objective (Morgan and Sonnino, 2010; Cohen and Ilieva, 2015; Ilieva, 2017; Gugerell and Penker, 2020). With new challenges ahead, local governments are taking on a more prominent role and recalibrating the binary relationship between public and private actors (Martens et al., 2022). Furthermore, since food production is localized mainly in rural contexts, the strategic collaboration between rural mayors and local farmers is of particular interest (Favilli et al., 2015; Jaklin et al., 2015; Hubeau et al., 2017; Dubois, 2019; de Souza et al., 2021; Martens et al., 2022).

We propose the proximity approach as a conceptual framework to study social innovation processes aiming at sustainable transformation to shed more light on the social innovation capacity of rural public and private actors (Boschma R., 2005; Dubois, 2019). This approach was established by the French school of proximities and subsequently conceptualized by Boschma in the field of innovation geography (Boschma R., 2005; Boschma and Frenken, 2010). It analyses the effects of geographic, institutional, social, organizational and cognitive proximity on innovation. In fact, the approach is slowly gaining popularity in the agri-food system literature (Dubois, 2018). Here, it has been used primarily to examine the interaction between farmers and consumers. Dubois (2018), for example, has made an important connection between the agricultural and proximity literature by examining empirically the producer-consumer relationships of organic farmers in rural Sweden. It shows that even in the agri-food context, proximity can have multiple purposes that rarely emerge in isolation from one another but are in relation to one another. Dubois (2018) observes that one proximity can serve as an "incubator for other types of proximity." Gugerell et al. (2021) found that the attractiveness of community-based agriculture in Vienna can be supported by promoting cognitive and institutional proximity. In addition, Gugerell and Penker (2020) applied the proximity approach to study the transition paths of niche organizations and their networks, focusing on urban areas. Edelman et al. (2020) used the proximity approach to examine the relationships between coffee farmers and restaurant owners and found that a lack of social relations and a power imbalance weakened business relationships. In another study, Dubois (2019) emphasized the impact of peripherality on farmers' ability to adopt new, more sustainable practices by applying the proximity approach to study the different stages of innovation processes. However, since different types of innovation require different determinants and because innovation context and territory have implications for innovation processes (Geldes and Felzensztein, 2013; Geldes et al., 2017), there is a need to explore whether the proximity approach can be used to study social innovation in local public-private collaboration models in rural areas. To the best of our knowledge, neither study has yet applied the proximity approach to understand rural public-private initiatives aimed at sustainable transformation of the agri-food system, nor has the applicability of the proximity approach been explored from the perspective of the social innovation capacity of different actors. This paper will, therefore, be guided by two research questions:

Can the proximity approach be used to study rural social innovation processes?

How can one describe and promote rural local public-private collaboration models that aim at strengthening sustainable agri-food system transformation?

The article begins with a conceptual framework that distinguishes between sustainable transformation and conventional innovations and reflects on the literature on social innovation capacities among the actors in focus: mayors and farmers. The proximity approach and related studies in the agri-food literature are then introduced. We use two case studies from southwestern Germany in chapter 4 to compare how spatially proximate local governments and farmers have developed and implemented social innovations in local agri-food systems, revealing divergent outcomes despite similar conditions. The article concludes with a discussion of the research question and a critical assessment of the suitability of the framework for this investigation.

## 2. Conceptual framework – enabling and understanding transformation within the local rural agri-food sector by applying the proximity approach

New institutions need to be created that provide solutions to secure our resources to enable a sustainable transformation (Folke et al., 2010; Ziervogel et al., 2016). Transforming the agri-food system is seen as a major challenge, as it is a cross-cutting sector involving many actors (Markard et al., 2012; Kump and Fikar, 2021) and, thus, requires a transformation of many subsystems at different spatial levels, running in parallel but on different time axes. The fact that production and consumption take place primarily in different locations, often spread across the globe, is seen as another obstacle. Accordingly, there is a trend toward the localization of agri-food systems that encounters shortening food value chains, reconnecting consumers and producers, and leading to a realignment of policy benchmarks by public sector authorities (Lamine et al., 2012; Chiffolleau and Dourian, 2020). This provides an opportunity to analyze rural local institutions and the social innovation processes that are involved.

Innovations are usually seen as outputs of large investments in industries or knowledge infrastructures, aiming at economic growth (Moulaert and Sekia, 2003; Shearmur, 2012, 2017) and are theorized primarily as a single entrepreneur's activities (Schumpeter, 1934; Hospers, 2005; Richter, 2018). Thus, social innovations that foster sustainable transformation – not only within the agri-food sector – seemed to be shaped differently and, therefore, deserve a more detailed look. Actors, for example, who seek innovations that lead to sustainable transformation face different obstacles than those who seek innovations that lead solely to economic growth.

Innovation processes are processes of knowledge generation that can lead to transformation. They also involve uncertainties that people are reluctant to face (Hannan and Freeman, 1977; Boschma R., 2005). At the same time, many scholars agree that innovation processes that drive sustainable transformation cannot be managed by one entrepreneur due to their complexity and all-encompassing nature (Ostrom, 2000; Bodin, 2017; Martens et al., 2021). Collaborative processes also carry additional potential for conflict – especially when interest in the stakes are high and the outcome uncertain (Vatn, 2005; Bodin, 2017; Davids and Frenken, 2018). Accordingly, social innovation aiming at sustainable transformation is a process of collective action that will simultaneously encounter resistance at various levels.

- Firstly, because they involve changes to which people do not like to expose themselves.

- Secondly, because they are processes of collective action and, thus, give rise to additional uncertainties and potential for friction; and
- thirdly, because they involve processes that are not aimed primarily at enriching private actors and, therefore, the intrinsic motivation of actors to act must be more complex (Ostrom, 2000; Vanni, 2014; Martens et al., 2021).

Understanding how to initiate and manage social innovations successfully is, thus, a key issue in promoting sustainable transformation. We argue that the quality of change processes depends on the social innovation capacities of the actors involved. By social innovation capacity, we mean the ability and willingness of actors to overcome the challenges mentioned above and, simultaneously, bring in and pool the right resources to initiate or actively shape change processes. Why we refer to private and public actors here has already been explained. In the following, we provide a summary of the discourse on their social innovation capacity.

### 2.1. Social innovation capacities of farmers<sup>1</sup>

Farmers can generally be classified as private actors because they are independent individuals who offer products on the market to earn their income. Looking into the innovation literature, private actors are often still described following a neoclassical narrative. They follow the market principle, i.e., they sell their goods and services on the market and try to gain competitive advantage by introducing innovations in order to compete or be superior to other market participants (Hospers, 2005; Billis, 2010; Defourny and Nyssens, 2012). However, some studies have found that farmers' ability to innovate differs from that of other private actors. Farmers, for example, cannot easily relocate their assets to find a place with lower transaction costs. In addition, agriculture is considered a more traditional sector than other industries, which means that the location and traditions play a more important role, making it more difficult to turn to new structures and networks (Ben Letaifa et al., 2013). The market position of a farm is strongly related to its specialization (e.g., arable cropping, livestock, mixed farm, specialization in vegetables, fruit), which again is strongly determined through the geophysical settings (e.g., altitude, soil quality, water availability) and entails capital fixed to investments at the farm site. Specialization also implies path dependencies and can cause typical innovation barriers, such as labor resources, learning costs, technology fit, and skills and networking options (Weltin et al., 2021). Farmers' ability to innovate can also be hampered by the fact that they are closely embedded in and dependent on support from national and transnational policies. The individual farmer has little bargaining power in the prevailing system and its structures and is often ignored at the policy level when it comes to designing supportive policies for the sector and climate change mitigation, even when the policies are transformational (Martens and Zscheischler, 2022). However, when focusing on their social innovation capacity, it must be mentioned that farmers have long been familiar with the principle of collective solutions among themselves through the presence and dependence of agricultural

<sup>1</sup> Local farmers, farmers on small and medium size farms, family farms.

cooperatives, at least in technical solutions such as pooling machinery or in cooperatives in the supplier and processing sector (e.g., wine, fruit, dairy). Public tasks, such as support for economic, social activities or winter maintenance, in rural areas are often taken over by agricultural cooperatives because rural communities lack the resources (Wolz et al., 2014; Figueiredo and Franco, 2018; Schmidt, 2019). Thus, farmers do not only produce private goods but also provide public goods and services (Schaft and Brosig, 2020). Farmers are often one of the only economic actors that improve the resilience of local rural communities (Rivera et al., 2020), and hold an important role in landscape and environmental protection. Therefore, in terms of sustainable transformation, it is important to consider the multiple spheres of influence of farmers and understand how this affects their social innovation capacity when it comes to engaging in multi-actor initiatives.

Studies have found that farmers tend to prefer individualism and independent action when it comes to their business. Aubry and Kebir (2013) found that farmers are more likely to avoid joining collectively organized institutions that shorten the food value chain when they see other opportunity. This is consistent with Dessart et al.'s (2019) argument that farmers adopt new, more sustainable practices not because they are intrinsically motivated toward sustainable transformation but because they feel increasing pressure from the media, local civil society or retailers. Interestingly, farmers themselves, for example, see the greatest opportunities in the increased implementation of sustainable intensification solutions at the landscape level, which includes at least coordinated action, and no longer just at the farm level (Weltin et al., 2018). The communication, marketing and logistic requirements for collective action toward sustainable transformation are said to be very high and different from farmers' previous roles (Bruce et al., 2017; Charatsari et al., 2020; Chiffolleau and Dourian, 2020). However, the social innovation capacity of farmers also seems to depend on the type of farming. Jaklin et al. (2015) suggest that organic farmers particularly like to work with new alternative food cooperatives because they share similar values, accommodate farmers on pricing and offer flexibility. Chiffolleau (2009) takes a different perspective, arguing that joining alternative food production offers an opportunity for farmers to renew their relationship with consumers. More direct producer-consumer interaction in alternative food networks has been described as a reciprocal relationship to stabilize the economy of a farm by fulfilling needs of the farmers and the consumers, primarily through providing access to finance, land and produce (Opitz et al., 2019). That means that farmers participate in alternative food networks not only for the potential economic benefits but to strive for other values (Charatsari et al., 2020). These points indicate that farmers' motivations go far beyond monetary profit generation; they seek further objectives that might initiate or contribute to sustainable transformation. This brief overview of farmers' social innovation capacity does not claim to be exhaustive. Nevertheless, it is clear that farmers represent an important and sensitive target group if transformation is understood as an approach to institutional renewal.

## 2.2. Social innovation capacity of rural mayors

Rural mayors are public actors who manage public goods according to the principle of redistribution. Local governments are democratically legitimized by being elected for a fixed term in modern

societies of the Global North. During their tenure, they are obliged to follow rules for the pooling and distribution of tax revenues and other public resources assigned to them by virtue of their office (Billis, 2010; Defourny and Nyssens, 2012). These responsibilities for local governments differ from those of regional or national governments and vary from country to country. However, local governments often decide regarding public procurement following sustainability principles, construction projects and land lease and, therefore, have local power as well as tendering and purchasing power on the related markets.

It could be argued that, as stewards of public goods, mayors are responsible for managing transformation in the agri-food system and, thus, have a high social innovation propensity and capacity. To date, however, mayors in rural areas have rarely proven to be the drivers of such transformation. Rather, agri-food system transformation appears to be consumer-driven and "based on urban activism" (DuPuis et al., 2005). This shows the increasing interest of other actors in governmental tasks (governance) or even dissatisfaction with their work, which leads to support but also a loss of power of rural local government officials (Defourny and Nyssens, 2012). With this in mind, DuPuis et al. (2005) asked about raising the awareness of the issue of establishing local food strategies by asking "which local institutions are more successful in promoting democratic, reflexive localist solutions and which merely perpetuate local inequalities" (DuPuis et al., 2005). Similarly, Gugerell and Penker (2020) emphasize that a major challenge for alternative food networks is not to align with the dominant system that has been supported by the public sector for decades. Citing Boschma R. (2005), Grabher (1993) and Herrigel (1993), already points to a certain innovation problem when powerful actors are involved, as they may choose conservative solutions before supporting new institutions that could lead to a loss of power. The sustainability transformation of the agri-food system is a challenging task for rural mayors who are caught between an overarching agricultural policy, the influence of large agribusinesses and the management of other conflicting interests – including competing sustainable transformation issues, such as energy, housing and mobility.

Nevertheless, the literature indicates that the pressure and motivation to deal with environmental crises is increasing in local governments (de Souza et al., 2021). The demand for locally produced, high-quality food has increased dramatically particularly since the COVID-19 pandemic, pushing local governments to act (Cappelli and Cini, 2020; Kump and Fikar, 2021). Marsden and Sonnino (2012) recommend that policymakers should promote alternative food networks on a smaller scale rather than aiming to scale up existing initiatives, indicating that all mayors should feel responsible for actively engaging in or initiating agri-food transformation (Hinrichs, 2003; Cohen and Ilieva, 2015; Ilieva, 2017; Gava et al., 2018; Gugerell and Penker, 2020). The literature on the role and social innovation capacity of rural local governments in transforming the agri-food sector is rare. While most studies do not directly suggest that local governments take over this task, the need for facilitators, intermediaries or innovation brokers in this area is clearly stated (Kivimaa, 2014). Hence, rural mayors could act as facilitators and social innovation brokers, thus, build networks, take care of public fundraising, fill knowledge gaps between actors, develop strategies, build trust and long-term perspectives, and promote food literacy (van Lente et al., 2003; Howells, 2006; Dalziel, 2010; Kilelu et al., 2011;



TABLE 1 Proximities and characteristics (adapted after Boschma R., 2005).

	Specification	Too little proximity	Too much proximity
Geographical proximity	Physical distance	No spatial externalities	Lack of geographical openness
Social proximity	Friendship, experience	Opportunism	No economic rationale
Institutional proximity	Formal and informal norms and rules	Opportunism	Lock-in
Cognitive proximity	Knowledge background	Misunderstanding	Lack of sources of novelty
Organizational proximity	Structure and organization of collective action	Opportunism	Bureaucracy

Gugerell and Penker, 2020; Janssen et al., 2020). Dania et al. (2018) see local governments as particularly important because they typically have a broad network that can be essential for the success of new social innovation processes.

These are the reasons for our ambition to provide a conceptual framework that not only looks at specific social innovation capacities but also delves deeper into how (process of collective action) and why (reasons for engagement) such social innovation occurs.

### 2.3. Conceptualizing the proximity approach to understand new agri-food system collaboration models

The proximity approach enables the study of collective action between actors by identifying reasons why these actors collaborate (or why they do not). Boschma identifies five different proximity factors that can lead to the explanation of collaborations and, thus, innovations: geographic, social, institutional, cognitive and organizational proximity. It is important to understand that these proximity factors are not mutually exclusive, that they can occur simultaneously, or that one factor can replace or promote another factor. Many studies have demonstrated that the approach can be used to characterize innovation processes (Boschma and Frenken, 2010; Boschma and Martin, 2010; Geldes and Felzensztein, 2013; Geldes et al., 2017; Villani et al., 2017; Capone and Lazzeretti, 2018; Davids and Frenken, 2018). However, the proximity approach has been applied mainly to understand innovation in urban areas and, therefore, to understand the innovation capacities of actors of certain mainly urban-based industries or other knowledge infrastructures. To this end, we would like to engage in a discussion on how the different proximities can be applied to the study of social innovation to promote sustainable transformation. In addition to defining the proximities, we have provided additional considerations to align the framework with its new scope in “Geographic proximity to organizational proximity.” Applying the proximity concept not only serves to identify solutions to promote sustainable transformation in rural areas, but is also an important insight for the innovation geography literature that seeks examples of how spatial innovation operates alongside the innovations that generate patents and publications (Boschma R., 2005; Heringa et al., 2014; Capone and Lazzeretti, 2018).

#### 2.3.1. Geographic proximity

Geographic proximity represents the physical distance between innovation actors (Howells, 2002). While short distances are supposed to favor knowledge sharing, networking, collaboration and innovation, long distances require more complementary proximities to achieve

closeness (Table 1; Boschma R., 2005). The notion that geographic proximity favors innovation and is, thus, a necessary condition for fostering innovation has long been held by many geographic theories of innovation, such as Porter’s cluster concept and other approaches to agglomeration economics (Moulaert and Sekia, 2003; Shearmur et al., 2018; Martens et al., 2021). Therefore, Boschma’s approach is interesting because it departs from this narrative and identifies other proximity factors that can lead to innovation even when actors are not operating in close physical proximity to each other. This also makes it interesting for the study of social innovations in rural areas, which are characterized precisely by a lower number of heterogeneous knowledge sources and actors (Shearmur, 2012, 2017; Martens et al., 2021).

In recent decades, farmers have established their economic relationships mainly through the market with actors rarely characterized by geographical proximity (de Souza et al., 2021). This implies that a shift to regional short food chains and, thus, contacts with actors in geographic proximity is a fundamental change, especially since the new collaborative partners are not only private actors, but also civil society and public actors with different objectives and knowledge bases (Martens et al., 2021, 2022). Geographical proximity between actors is a current theme in the literature on alternative food networks, especially to describe the relationships between producers and consumers. The focus is on face-to-face interaction, which is assumed to be more likely with higher geographical proximity (Whatmore et al., 2003; Dowler et al., 2009; Kneafsey et al., 2013; Mundler, 2022). Thorsøe and Noe (2016), for example, distinguish between producer-consumer relationships in physical face-to-face, mediated virtual and systemic contacts, without immediate geographic proximity between consumers and producers. It is interesting to note that the literature on relocalization often states that the greater the geographic proximity, i.e., which often means without intermediaries, the better the transformation of the agri-food system. There may be a contradiction here between scholars who study short value chains and those who seek to promote and study transformation processes, as it is said here that intermediaries are needed to manage the increasing demand and complexity of a transformation process. Dubois (2018) does not seem to see this contradiction, noting that alternative food networks need to create spaces for consumers and producers to allow face-to-face contact, as this is important to build trust among these actors. In this context, we also learn from other disciplines that direct contact between actors is crucial to foster the willingness to act together to preserve public resources (Ostrom and Walker, 1997). Improving geographical proximity promotes social proximity, which seems to be an important strategy for alternative food networks. These findings underline the link between proximity factors also in social innovation processes.

### 2.3.2. Social proximity

Social proximity describes the impact of trust built through friendship, solidarity and experience by repeated interaction. This proximity focuses on the relationship of the actors involved in the collaboration and, therefore, has to be measured on the microlevel (Hinrichs, 2000; Boschma R., 2005; Boschma and Frenken, 2010; Thorsøe and Noe, 2016). This notion comes originally from the social embeddedness literature, which states that economic collaborations are always integrated in a social context, impacting collaboration outcome (Polanyi, 1944; Granovetter, 1985; Uzzi, 1997). Trust between actors, for example, lowers the barrier to sharing informal knowledge that is important for innovation success and also lessens the perceived risk of conflicts, such as opportunism by one of the actors (Boschma and Frenken, 2010; Ben Letaifa et al., 2013). Additionally, Capone and Lazzarotti (2018) argue that there is a higher chance of initiating innovation with a friend than with someone unknown. However, as with all proximities, social proximity does not always lead to successful collaboration. It depends on “the optimal social distance [...] a balance between embedded relationships within cliques and strategic ‘structural hole’ relationships among cliques” (Table 1; Boschma and Frenken, 2010).

The pursuit of social innovation that promotes agri-food system change requires that actors have the capacity for social innovation, as described in “Conceptual framework – enabling and understanding transformation within the local rural agri-food sector by applying the proximity approach.” Several studies suggest that, for this reason, social proximity plays a special role as it strengthens the willingness of actors to participate in projects even if they are not primarily market-oriented (Figueiredo and Franco, 2018; Martens et al., 2021). Pretty (2003), for example, notes that when social proximity is present, actors have the trust to invest in collective activities because they feel confident that others will do the same. Other studies suggest that social proximity between consumers and producers lead to an appreciation and recognition of the origin and quality of food, which is an important incentive for farmers to participate in short food chains (Murdoch et al., 2000; Watts et al., 2005; Milestad et al., 2010; Forney and Häberli, 2016; Thorsøe and Noe, 2016; Dubois, 2018). Forney and Häberli (2016) and others even see social proximity as a driver of relocalization rather than geographic proximity, as the distance between producer and consumer can be bridged by social proximity (Renting et al., 2003; Aubry and Kebir, 2013; Thorsøe and Noe, 2016; Dubois, 2019).

### 2.3.3. Institutional proximity

The concept of institutional proximity has its roots in what North (1990) called macrolevel norms and values. Macrolevel institutions can be divided into formal institutions, such as laws and formal rules, and informal institutions, such as values and cultural norms (Edquist and Johnson, 1997; Hall and Soskice, 2001). Too much institutional closeness can lead to change-averse behavior in a region or system and create the impression that no change or collaboration is taking place (Table 1; Hannan and Freeman, 1977). A lack of institutions can lead to opportunism (Boschma R., 2005). According to Boschma R. (2005), the institutional environment must reflect some “kind of balance between institutional stability (reducing uncertainty and opportunism), openness (providing opportunities for new entrants), and flexibility (experimenting with new institutions)” in order to enable innovation.

Institutions enable collaboration and, thus, social innovations because they “create stable conditions for interactive learning” (Boschma and Frenken, 2010). More specifically, shared laws, rules, language, habits, routines or established practices facilitate collective action by lowering transaction costs and reducing uncertainty (Edquist and Johnson, 1997; Maskell and Malmberg, 1999). Collective action is easier when each actor knows the rules of the game and shares values and cultural habits (Zukin and Dimaggio, 1990). Interestingly, by providing an example for low institutional proximity, Boschma and Frenken (2010) refer to university-industry-government relationships, noting that in this context, different key actors operate with different sets of norms and rules (Etzkowitz and Leydesdorff, 2000). Hence, in our context, this might be the case when looking into rural public-private collaboration models.

Another aspect of institutional proximity needs to be highlighted when focusing on rural local communities. Institutional proximity also refers to legal rules, thus, this proximity factor also targets ownership and property rights (Boschma R. A., 2005). Looking at local public-private collaboration models, this might create a power imbalance because local governments usually have the power to distribute land rights, on which farmers depend in order to do their business. On the one hand, this creates a powerful tool for local governments to shape transformation in order to relocate land rights to alternative food network actors. On the other hand, it can lead to additional uncertainties for farmers and trust problems in the collaboration if the actors do not communicate at eye level. As trust based on common institutions is a key factor of this proximity factor and differs from trust based on social relations of the social proximity factor (Boschma R. A., 2005).

### 2.3.4. Cognitive proximity

Cognitive proximity is a concept that refers to the degree to which actors can understand, interpret and utilize new knowledge. This is because a shared knowledge base provides a better foundation for building and exchanging knowledge than when actors from vastly different backgrounds interact (Filippi and Torre, 2003; Broekel and Boschma, 2012). It is important to note that, as with other proximity factors, cognitive proximity can be excessive or insufficient. Nooteboom (2001) posits that excessive cognitive proximity occurs when actors possess similar knowledge bases, which limits their ability to teach each other and hinders interactive learning. Conversely, inadequate cognitive closeness, which can be termed a “cognitive lock-in,” arises when actors are unable to understand each other even though they share a common language, resulting in difficulties in communication and interactive learning (Table 1; Boschma R., 2005).

Regarding the transformation of the agri-food sector, the question arises whether the currently still dominant agri-food system has degraded rural areas into such a cognitive lock-in area. Accordingly, a strategy of relocalizing the value chain for more sustainable production implies that the number of different sources of knowledge must be regionally reintegrated. This point is also made by Lamine et al. (2012), who conduct research on short food supply chains and emphasize the importance of considering the diversity of actors. Following the idea of geographic innovation research, the introduction of new sustainable practices and short food supply chains could lead to follow-on innovations that ultimately drive change, as regions with many actors in different similar sectors can increase the number of innovations in a region.

### 2.3.5. Organizational proximity

Organizational proximity, as defined by [Boschma R. \(2005\)](#), pertains to the extent of shared relationships within or between organizations, and encompasses the degree of autonomy and control that can be exercised within these arrangements. Similarly, [Moore \(2006\)](#) characterizes organizational proximity as the nature of relationships among actors, ranging from loosely connected relationships marked by independence to highly coordinated and interdependent innovation ecosystems characterized by control and interdependence. The importance of organizational proximity in innovation processes is widely recognized as it can reduce uncertainty and opportunism, especially when social proximity and institutional proximity are scarce. [Nootboom \(1999\)](#) further asserts that it lowers transaction costs and enables collaboration through the establishment of collective action rules. The degree of organizational proximity can range from highly formal, such as within hierarchically structured firms, to highly informal, in loose networks without hierarchies ([Williamson, 1985](#)). Nevertheless, excessive organizational proximity may lead to excessive bureaucracy and hierarchy, thus, inhibiting intra- and interorganizational learning ([Saxenian, 1996](#)), while weak organizational proximity may result in insufficient control and coordination, impeding collaboration and innovation ([Table 1; Boschma R., 2005](#)).

Interestingly, [Nootboom \(1999\)](#) notes that “formal contracting is almost impossible when it concerns complex and long-term research collaborations in which it is difficult to determine and codify the activities to be undertaken and the expected returns” ([Nootboom, 1999](#); as cited in [Boschma and Frenken, 2010](#)). Although the present study is not focused specifically on research collaborations, it is worth considering whether this holds true for collaborations aimed at sustainable transformation, which may also involve complex and long-term processes. How can such collaborations be best organized? According to [Boschma R. \(2005\)](#), both flexibility and a certain degree of control is necessary for successful collaborations, which might be best covered by loosely coupled systems, such as hybrid organizational models providing access to complementary resources.

Therefore, models of public-private collaboration may have some potential to establish successful social innovations. However, some studies in the literature on alternative food networks highlight organizational issues. [Little et al. \(2010\)](#), for instance, noted that alternative food networks face maintenance problems due to a lack of legal and organizational structure. Additionally, [Kirwan et al. \(2013\)](#) identified free-riding, a common problem in many social enterprises ([Tavella and Papadopoulos, 2017](#)). The degree of coordination and control also differs based on the size of the alternative food network. Smaller networks tend to balance power better and can engage in fair bargaining practices regarding food prices with farmers ([Gaitán-Cremaschi et al., 2019; Lamine et al., 2019](#)).

## 3. Methodology

A comparative case study design was chosen to explore the conceptual framework and research questions further because it allows for an in-depth analysis of a particular phenomenon in its context ([Silverman, 2017](#)). The cases were selected because they were similar in important aspects, but had different outcomes at the time of the study (between 2021 and 2022). In both cases, the municipalities’

mayors played a central role in initiating a farmers’ shop in their community, offering, among other things, local food products. One initiative already had a commitment from a few farmers to collaborate and the other did not, which makes these two cases interesting to analyze using the proximity approach. To ensure the anonymity of the interviewees, little case-specific information is revealed here. The cases investigated are located in South Germany in two different neighboring/adjacent municipalities within the same district and, therefore, the cases share a similar contextual and biophysical setting. To ensure a close link between theory and empirical data, the research used an iterative approach based on the principles of grounded theory ([Walker and Myrick, 2006; Wagenaar, 2014](#)), i.e., the literature review and data collection phases overlapped.

The study used a qualitative approach with semi-structured interviews to examine the establishment phase of the two multi-actor initiatives studied. Data collection was conducted in three phases during July 2021, October–November 2021 and February 2022. Firstly, exploratory *in situ* interviews were conducted with the mayors of the two municipalities to gain an understanding of their role in the initiatives and the baseline situation. Based on the results of these interviews, the research focus was refined to examine the role of proximities in the foundation phase of the initiatives, as it was determined that both initiatives were still in that phase. In the second round of interviews, two to three farmers ([Table 2](#)) who were approached by the mayor to collaborate with the respective initiative were interviewed for about 1 h each to explore their perspective and role in the initiative as well as their relationship with the mayor. The sample size was limited due to the small size of the communities and the small number of resident farmers. In addition, two farmers who agreed to be interviewed later withdrew their decision (one for family reasons, the other because of personal objections to the initiative). The interviews were based on a predefined guide and were slightly adapted for each round. Interviews were recorded with the consent of the stakeholders and transcribed to facilitate data analysis.

The process of data analysis began with a transcription of the interviews, followed by qualitative content analysis using MAXQDA software. Coding was both deductive and inductive, with deductive codes each reflecting a proximity category and combined with inductive codes. The coding was reviewed and refined in several iterations to ensure consistency and accuracy. Finally, the coded data were analyzed thematically to identify topics related to the research focus on the role of proximity in the formation phase of initiative formation.

## 4. Results

In the interviews, we explore the extent to which mayors in rural areas and residential farmers are able to initiate multi-actor initiatives to promote sustainable transformation. Investigation results from two case studies with similar examples of mayors initiating local farm stores and seeking collaboration with local farmers allow us to explore this research question not only theoretically but also empirically. We have structured our findings along the five dimensions of proximity explained in “Conceptualizing the proximity approach to understand new agri-food system collaboration models” and will then summarize our findings, focusing on the theme of the social capacity of the two actors.

TABLE 2 Introduction of the case and collaborating partners.

Case name	Actor interviewed	Description
Village Confirm <sup>1</sup> (C)		<ul style="list-style-type: none"> <li>- South Germany</li> <li>- Approx. 4,000 inhabitants</li> </ul> <p><u>Goals for the initiative</u></p> <ul style="list-style-type: none"> <li>- Inclusion, education, visibility of local farmers, transparency of value chain</li> </ul> <p><u>Current project status</u></p> <ul style="list-style-type: none"> <li>- Collaboration with farmers is confirmed</li> <li>- Financing is secured</li> <li>- Structural preparation of the location is in process</li> </ul>
	Mayor C	
	Farmer C1	<ul style="list-style-type: none"> <li>- Family Farm</li> <li>- Farmers in the third generation</li> <li>- Cultivation of crops and fruits</li> </ul>
	Farmer C2	<ul style="list-style-type: none"> <li>- Part-time farmer (farm is run by two related farmers)</li> <li>- Farm was converted recently (formerly pig mast now crop farming)</li> </ul>
	Farmer C3	<ul style="list-style-type: none"> <li>- Family Farm (two brothers)</li> <li>- Market crops, corn, wheat (Previously also cattle and pig breeding and mast)</li> </ul>
Village Waiting <sup>2</sup> (W)		<ul style="list-style-type: none"> <li>- South Germany</li> <li>- Approx. 11,000 inhabitants</li> </ul> <p><u>Goals for the initiative</u></p> <ul style="list-style-type: none"> <li>- Revitalization of the town center, neighborhood support, education and knowledge transfer, promotion of sustainable nutrition, strengthening of regional employers</li> </ul> <p><u>Current project status</u></p> <ul style="list-style-type: none"> <li>- Collaboration with farmers is yet to be confirmed</li> <li>- Plans for structural preparation of the location are available</li> </ul>
	Mayor W	
	Farmer W1	<ul style="list-style-type: none"> <li>- Family vineyard</li> <li>- part-time farmer</li> </ul>
	Farmer W2	<ul style="list-style-type: none"> <li>- Family farm</li> <li>- Direct marketing</li> <li>- Primarily potatoes</li> </ul>

<sup>1</sup>The name of the village referred to the current status of the public-private collaboration initiative. In this village, the collaboration between the farmers and the mayor was confirmed to the time of the interview. <sup>2</sup>The name of the village referred to the current status of the public-private collaboration initiative. In this village, the collaboration between the farmers and the mayor had not yet been confirmed at the time of the interview. The farmers are interested, but want to wait for the further development of the project before making a decision, while the mayor waits for the producer to confirm their collaboration.

### 4.1. The role of geographic proximity in forming the rural public-private collaboration models

The interview statements showed that geographic proximity – meaning the physical distance of the collaborative actors – is not trivial. The actors interviewed indicated various distances as relevant to the success of the initiatives. Primarily, the distance of the farmers to the farm store was mentioned here. In addition, the distance to other relevant actors was addressed and the issue of regionalization. The direct distance between the mayor’s office and the farms themselves was not mentioned. It can generally be applied that in both cases, geographic proximity between public and private actors is given because farmers are located in the same (village C) or close proximity to the municipality (village W).

Results show that the location where the initiative is to be established is important for the farmers regarding their decision to get involved. If the location is too far away and, therefore, the logistics

costs for delivering the products are too high, they are unlikely to participate in the initiative. The following quotes were especially interesting because they suggest that the initiative has to pay off at a certain distance.

*I: “... does distance play a role for you in deciding for or against the project?”*

*Quote (Q) 1: Farmer W1.*

*“No, no. So for me not, because it is just 2 kilometers, 3 kilometers away. That’s already good, so then I would now already be within a radius of 15, 20 kilometers of it. Anything further away would really be a pain threshold for me, because I would then also have a longer, time-consuming commute.”*

*Q2: Farmer W2.*

*“So we are already driving for three-quarters of an hour. We also drive to [...], which is also three quarters of an hour. But further... [...] then it must be profitable.”*



However, the willingness to participate is also dependent on the products that the farmers grow. Interestingly, there seems to be a necessary distance for certain products, as one farmer says that it is better for his brews not to be sold directly on the farm, as certain customers might find it better to buy them where they can shop more anonymously. While other farmers would be interested in developing not only the local but also a regional market with their products and would be willing to deliver longer distances.

Another argument made regarding geographic proximity was that regionalization is becoming more important as transportation costs increase (Q3). Farmers show interest in supporting the collaboration initiative because it is a local initiative that helps supporting local businesses. One farmer especially emphasized that the project should collaborate only with farmers in the surrounding area and not with the big players that are far away (Q4).

Q3: Farmer C3.

*“It used to be that transport did not really cost anything ... Now you realize again that transport is not such a matter of course. ... In other words, that regionalism can still live on the basis of economic efficiency. Well, for quite a while, you would not have believed it.”*

Q4: Farmer W1.

*“Personally, it would simply be important for me to first address the surrounding farms, whether this concerns winegrowers or organic farms or basically farms that produce goods, and not directly to large players that are perhaps a hundred kilometers away or 50 kilometers away.”*

While not directly targeting the relationship between farmer and mayors, one interesting finding has been regarding the rural characteristics within the debate of sustainable transformation. The mayor in village C, for example, emphasized the importance of rural municipalities to steer change processes by saying “if we did not do it, nobody would do it.” In this particular case, he was seeking support from other social associations and got rejected with the explanation that the village was too far away from the bigger town where the social association was located.

## 4.2. The role of social proximity in forming the rural public-private collaboration models

In both cases, social proximity – defined as the impact of trust built by friendship, solidarity and experience through repeated interaction (see “Social proximity”) – between the mayors and farmers interviewed has been rather low. Social proximity could be identified out of primarily formal relationships with each other prior to the initiative. The interviewees did not refer to personal characteristics of the respective actor but reported, for example, relationships such as:

Q5: Farmer C1.

*“we know him because he is the mayor” (C1) or*

Q6: Mayor C.

*“of course we know our farmers” (Mayor C).*

In village C, however, there seems to be more exchange and, thus, an assumed higher social proximity, justified mainly by the fact that the farmers are located in the community and, consequently, there are frequent discussions about land claims due to construction projects or similar land lease issues between the mayor and the farmers. As a result, experiences and, therefore, social proximity is built primarily on existing institutional proximity (legal relationship due to administrative relations).

Q7: Mayor C.

*“The entire town has a population of not quite 4,000, so, of course, we know our full-time farmers, who have always leased substantial parts of their farmland from the municipality.”*

Social proximity with one farmer in village C is built due to past experience, because farmer C2 is a member of the municipal council and, therefore, meets the mayor on a regular basis in the local political arena. This farmer has also gained trust through good experience in the past as he and the mayor have already successfully initiated a project together.

The relationship in village W is different and suggests less social proximity between the mayor and the farmers. The mayor said that they have too few farmers in their municipality who grow vegetables and that he, therefore, has to rely on farmers outside the municipality. In the following quote, the mayor’s (or the initiative’s) distance from the farmers is also made clear by the use of language; he refers, for example (Q8), to the initiative group and himself as “we” and to the farmers as “the others.”

Q8: Mayor W.

*“Those [i.e. farmers] from the market, of course, we know, and the others were named to us [...].”*

In addition to the fact that mayor W cannot draw on shared experience with farmers through institutional proximity, there is also another reason to conclude that there is less social proximity in case W than in case C. One farmer interviewed reported on negative experiences with mayor W (or the municipality) in the past, because they wanted to sell their vegetables at the market in the municipality, but did not get the selling space required.

## 4.3. The role of institutional proximity in forming the rural public-private collaboration models

Institutional proximities refer to perceived formal and informal norms and rules that impact the success of innovations. Both parameters could be found within the cases investigated and seemed to be relevant (Boschma R., 2005). Concerning their willingness and motivation to collaborate, certain reasoning could be found that indicated institutional proximity and distance.

Different informal norms and values between farmers and mayors in our sample were particularly evident in the issue of communication. An institutional distance regarding how much communication is relevant or necessary between the mayor and the farmers seemed

evident, as almost all of the farmers commented on not knowing the current processes and stated that they would prefer more clarity, through either more direct communication or frequent newspaper articles. By contrast, both mayors seemed satisfied with how the process was going.

Another example in terms of informal values and rules is that the farmers reported that they feel responsible for their region (Q9).

Q9: Farmer C3.

*"I would say that a farmer here also has a responsibility to the community. [...] You are out in the community every day. [...] We are well aware that we are not anonymous, yes."*

Regarding formal rules and norms, it became apparent multiple times that administrative borders have a significant impact on the success of collaboration as it seems much easier to collaborate with farmers within the municipality than outside (Q10).

Q10: Mayor W.

*"We have approached three concretely, and have, so far, a little restraint regarding the reactions, until it becomes even more concrete, so, until we also build. So, I think it is not problematic with [farmer W1], because we have them on our own territory. But we have farmers in the city area, but none who grows vegetables, apart from corn and wheat. Therefore, I have to go outside [the municipality's borders]."*

Furthermore, analyzing the two cases, we found that most actors are still operating within their institutional frames. This became apparent in the previous quote, as Mayor W (Q10) argues that they have to look outside for suitable farmers instead of starting a process where local farmers will change and diversify their products. In addition, the farmers are mainly arguing with economic mindsets, for example, by referring to the natural law of the market (Q12). In quote 11, farmer C1 shared that he also received a request from a local supermarket to supply his products. He would choose the new initiative over the supermarket because the mayor asked him first, which indicates his standards. On the other hand, we can also see his hesitation because of the lack of profit. This refers to the high surcharge on the product price in the new multi-actor initiative, which is also partly carried by the farmers.

Q11: Farmer C1.

*"[Supermarket] not yet, so there was also only a preliminary inquiry, but at the moment I'm putting [the initiative] first, because he [the mayor] asked me first [...]. Let us first see what comes out of it, because, of course, the sale in the [supermarket] is cheaper. Yes... It actually makes sense that you sell it where it's cheaper and where you (farmer) get more."*

Q12: Farmer C3.

*"It [farmer-shop] will not be an instant no-brainer. But that's the natural law of the market, and in the age of discounters, it's difficult."*

However, one farmer in village C also sees an opportunity within the farmer shop to overcome institutional barriers and increase the acceptance for more sustainable products. He alters his production,

introducing and experimenting with lentils and would be keen to do the same with hemp.

According to the interviews both mayors follow a dual mission with their projects, wanting to establish an economic self-sufficient business model, while, at the same time, aiming at social purpose, such as social and spatial justice (Q13,14). The mayors in both projects present themselves as initiators of the project, but also frequently refer to a group ("we") in their narratives, although it remains unclear who is meant by this. The mayors' statements suggest that they are committed to the multi-actor initiatives and intrinsically motivated. In both cases, however, it was multiple reasons that ultimately led to the project, as shown in the following quotes (Q13, 14). Nevertheless, they were able to convince their local councils to commit to these initiatives and provide initial funding.

Q13: Mayor C.

*"And in this respect, yes, the whole thing is the municipality. If we did not do it, nobody would do it."*

Q14: Mayor W.

*"Then there was a second impulse that we did two workshops on sustainable food and global justice, where we noticed that more people are dealing with this issue."*

#### 4.4. The role of cognitive proximity in forming the rural public-private collaboration models

Cognitive proximity refers to the background of the actors involved in the collaboration. In both cases, it is likely that a common knowledge base existed between both mayors and their farmers as they have similar regional knowledge. However, it can be assumed that cognitive proximity is greater in village C regarding knowledge about local conditions, since the actors live in the same municipality, in contrast to the actors in village W.

Furthermore, it is clear that there is a cognitive distance in both initiatives, since neither mayor has an agricultural background. From a farmer's point of view, the social innovation process would be easier if the mayor had had more agricultural knowledge.

Q15: Farmer C1.

*"Well, I would say that if it was someone from the profession, it might be easier, then it would not be quite so pretentious, I would say. He imagines many things – how should I put this now – are simpler than they actually are."*

The farmers' view of the mayor also show his suitability as a project initiator. Farmer C2, for example, unlike farmer C1, attributes sufficient knowledge of agriculture to the mayor because the latter is very interested in a particular product culture. In addition, one farmer in case W mentioned that the mayor is well suited because he has a neutral position. If another farmer controlled the process, opportunistic behavior could occur, such as more advantageous product placement. Another argument was that the mayor is important because he has a good network. In addition it was argued

that a person coming directly from university would not be in the right position to steer such a process.

Focusing on how a farmer's social innovation capacity unfolds in this regard, two interesting perspectives could be found in the data. Mayor C, for example, states that public and private actors have different mindsets in this regard. Referring to the motivation to initiate such an initiative, mayor C mentioned:

Q16: Mayor C.

*"...But for the farmers it is not: How do we make the world better? But: How can we bring about change for the position of agriculture, for their own business, and for their own lives here in the community?"*

The second perspective is given by farmer C2, pointing toward the need for knowledge from other actors to drive sustainable transformation as suggested by Charatsari et al. (2020).

Q17: Farmer C2:

*"Why am I doing this? – I myself do not want to do a farm store or anything. I see myself more as a crop farmer and also, I have to be honest, I'm not a baker, I'm not a grocer, I'm a crop farmer. What I can do is produce plants or produce plant products, that's where I see my motivation – to produce or produce top products, and the marketing or selling – that should be done by professionals."*

While the mayors have no agricultural background, there are farmers in both municipalities who have gained or are still actively gaining experience with political offices. One farmer in municipality C is a member of the municipal council, and one farmer in municipality W held a temporary representative office and reported that there was also increased interaction with the mayor during this time.

The different cognitive proximities of the two cases allow for a further assumption as to why the farmers in village C have already agreed to collaborate, whereas this has not happened in village W at the time of the interviews. With farmer C2 on the city council, the initiative had an important mediator who was familiar with the bureaucratic office, the processes and the official language. The farmer appreciated the mayor and expressed his trust in him to other farmers, kept them informed and took up the farmers' concerns. This is also reflected in the comments of another farmer who referred to the farmer on the municipal council as the first source of information on the current status of the initiative.

#### 4.5. The role of organizational proximity in forming the rural public-private collaboration models

According to the data, differences in organizational proximities – i.e. the structure and organization of collective action – can be observed. Village C has founded a nonprofit limited liability company for the implementation of the initiative. However, the farmers are not involved in this. According to mayor C, the collaboration with the farmers should be very loose and informal without contractual obligations, because he assumes in the interview that the farmers are deterred by this (Q18). Mayor C describes his

view on lowering the threshold for joining the initiative in the following quote:

Q18: Mayor C.

*"But that we have a common brand image outwardly. And everybody said, 'Yeah, well, that's additional at the moment. This is an opportunity for us without having to commit to anything, without having to put money in, invest in anything, but it's worth a try to start this on a small area and then see how it develops.'"*

I: *"So it's all been rather informal so far, without any signatures, so to speak?"*

Mayor: *"It will stay that way."*

In the case of village W, there is currently no business model, but according to the mayor, a citizens' cooperative is to be founded which is to establish the common and sustainable values (Q19). Contracts are to be made with the farmers.

Q19: Mayor W.

*"Yes, I believe that it is a safety factor that the government is on board, as if it is now only, in quotation marks, a cooperative, because of course [...] especially when something new is started, there is a certain risk associated with it."*

In both cases, interviews suggest that almost all farmers are found not to be fully engaged with the initiative. They are hardly involved by the mayors in any communication or social innovation process, and are seen more as a by-product that the initiative will deal with in due course. This triggers dissatisfaction among the farmers, which is evidenced by many unanswered questions and repeated statements of not knowing. In addition, the farmers' detailed speculations about the project make it clear that the mayors do not make use of important sources of knowledge (Q20).

Q20: Farmer W1.

*"So I do not have the current concept in my hand. I would not know now if it's runs then, if the employees are paid by the municipality, if the farmer shop is then self-supporting, if it's done by volunteers, if it's done by those who display their products in a community. I do not have the knowledge of what is being talked about."*

## 5. Discussion

### 5.1. Can the proximity approach be used to study rural social innovation processes?

We aimed at finding out with this study whether the proximity framework is suitable for studying social innovations that aim to promote sustainable transformation within the agri-food system. Based on the conceptual considerations, and two case studies, we demonstrated that proximity analysis is a valuable tool for accessing social innovation processes aimed at sustainable transformation. Through the empirical work, we were able to show how social innovation processes differ. In addition, we were able to

identified reasons explaining their different outcomes (farmers who have agreed to cooperate compared to farmers who have not yet committed). Based on these results, we summarize that it is possible to recommend alternative strategies to promote current and future social innovation in rural areas.

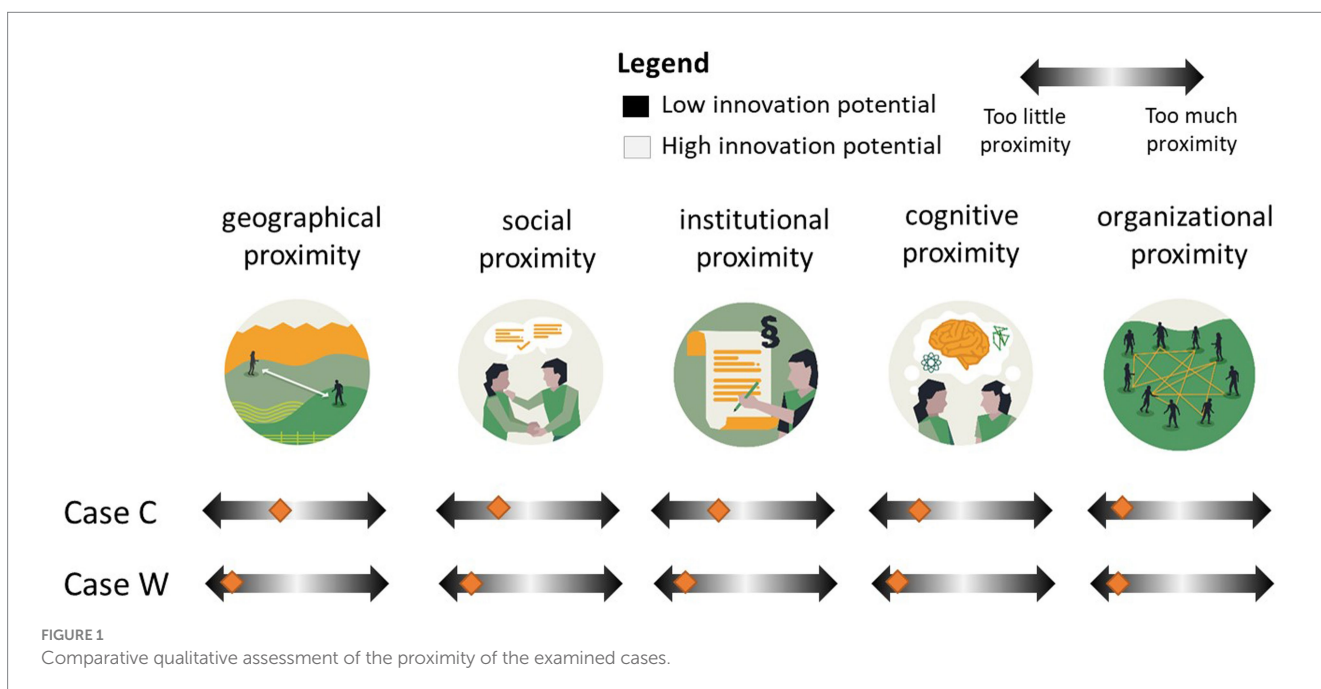
Both cases have different manifestations in the five proximity areas. They were still under development at the time of the study. It should be noted that the cases had different and diverse goals, as indicated in Table 2, and that in the analysis we looked specifically only at the farmers' interaction with the mayors on the question of whether you could imagine working together for the project. Overall, none of the respondents had major doubts about the general success of the overall initiatives. Therefore, both cases are rated with a fairly high innovation potential (Figure 1). In addition, Figure 1 illustrates that both social innovation processes are more under- than over-expressed in all proximities. This seems logical in view of the loose cooperation and lack of communication that we have identified (Q 18, 20). We have found in all categories, however, that it is possible to increase the degree of proximity between the actors involved or, if this is not possible, to replace it with other proximity factors. We will now discuss our results using a few proximities that we consider to be of particular interest.

Social innovation processes that promote sustainable transformation in rural areas vary depending on the actors involved and the characteristics of the place (Martens et al., 2021). Accordingly, we consider it relevant to discuss how flexible the proximity approach is in order to apply it to other regions and sectors. We note from our study that there appear to be multiple proximity pathways for successful social innovation. The geographical proximity between the given public and private actors, for example, can hardly be improved in our cases, since the actors are tied to their place due to their function (mayor) or their business (farm). However, geographical proximity has been found to be a significant success factor in Case C, as it is coupled with institutional proximity. This includes factors such as administrative boundaries

(Q5,6), familiarity with local leadership (Q6) and a sense of responsibility toward the community (Q9), all of which have been identified as crucial conditions for the success of social innovation among farmers, and possibly explains why farmers in Case C have already committed to the project. This social innovation pathway is not open to Case W because the farmers do not belong to the same municipality for which Mayor W is responsible. It will be crucial to establish a sense of belonging through other forms of proximity to compensate for this identified disadvantage. Accordingly, a different proximity pathway could be chosen in case W, which may involve more transaction costs.

We assume that organizational proximity holds considerable potential for promoting social innovation processes. Geographic and institutional proximity have limited dynamics, as explained earlier, and the impact on social and cognitive proximity is also marginal, as the number of key actors who can bring about sustainable transformation in a rural context is limited. Thus, personal and professional understanding between these key actors is not necessarily inherent. Conversely, organizational proximity may be actively desired by these actors and lead to the establishment of transparent cooperation guidelines, resulting in good social innovation governance (Martens et al., 2021). Moreover, the cultivation of organizational proximity can facilitate the emergence of other forms of proximity, including social and cognitive proximity.

In contrast to our initial assumption, we identified limited social proximity in both cases, as the actors involved did not exhibit close interpersonal connections ("Social proximity"). Our conceptual framework postulated that actors with close personal ties would be more inclined to invest the additional effort necessary for social innovation. Our empirical findings support this proposition. The case of the individual farmer in Case C vividly illustrates the importance of an intermediary who maintains close relationships with both groups of actors. Case W demonstrates that it is feasible to navigate social innovation processes without relying heavily on social proximity. However, case W also indicates that such endeavors pose





greater challenges for the local actors responsible for driving the transformation.

In conclusion, the concept of proximity also yields valuable insights into the meta-level of social innovation processes. The primary objective of this study was to investigate the factors that contribute to sustainable transformation. Among others, [Pel et al. \(2020\)](#) and [Ziervogel et al. \(2016\)](#) argue that such a transformation necessitates a dismantling of existing institutions and the establishment of new practices. These practices, aligned with the principles of social innovation, should be rooted in a collectively negotiated process that carries democratic legitimacy. The redefinition of norms and rules serves as a response to the influence of institutional proximity. Based on the concept of proximity, we would like to highlight two points that have emerged and prompted further reflection. Firstly, Case C underscores a notable shift in the power dynamics between the farmers and the mayor, particularly in the farmers' capacity as tenants of public land. Could the willingness to cooperate be influenced by this power dynamic? Can we call this a social innovation process? Is it a crucial lever for facilitating sustainable transformation, or is it in line with the arguments of [DuPuis et al. \(2005\)](#), who warn against an abuse of power by local elites? Secondly, it is evident in case W that the lack of specific types of farmers in municipality W, such as vegetable farmers according to mayor W, poses a challenge for the local transformation project (Q7). Breaking down existing institutions and fostering transformation here would be possible if the mayor sought collaboration with the farmers who are located in his municipality. This would require a profound change for farmers and thus a higher social innovation capacity, but would lead to the establishment of transformative capacities for the region in the long run. In terms of the sustainable transformation debate, these questions are worth discussion on a more political agenda.

## 5.2. How to describe and promote rural local public-private collaboration models that aim at strengthening sustainable agri-food system transformation?

This study examines models of collaboration among multiple actors, highlighting the diverse social innovation capacities of each actor. Based on the literature on sustainable transformation, collective action involving the pooling of resources from different actors is widely recognized as crucial ([Aubry and Kebir, 2013](#); [Jaklin et al., 2015](#); [Kump and Fikar, 2021](#)). We noticed a research gap in the agri-food system literature, as little attention has been given to understanding the functioning of collaboration or the reasons for its potential ineffectiveness, particularly in the context of public-private cooperation models in rural areas. In order to address this gap, we focus specifically on the capabilities that the actors under consideration possess and have identified three key arguments that highlight the challenges faced by social innovation actors. Firstly, the necessity to embrace and actively promote change. Secondly, the ability to withstand the uncertainty inherent in collective action processes. And thirdly, the prioritization of social impact over personal gain. By studying the social innovation capacities of public and private actors, we have improved our understanding of how collaboration among different actors and pooling of different resources can work to promote sustainable transformation in the agri-food

system. The most relevant findings are discussed here separately according to the groups of actors.

Our cases indicate that public actors (mayors) have the capacity to promote social innovation aimed at transforming agri-food systems. In both cases, the mayors used their networking and positioned themselves as patrons of the initiatives, creating legitimization for the topic in the community. They also retained their dominant position in the social innovation process and acted as initiators and drivers. Furthermore, public actors feel responsible for the provision of public goods and see this as their motivation for action (Q 13, 14). It should be noted that the mayors selected must be considered to have a high capacity for social innovation, as it is by no means normal for rural communities to engage with the agri-food system change and initiate alternative food networks. Especially since our results show that despite the fact that these are wealthier regions in Germany, mayors face obstacles due to the rurality of their communities. Exemplarily, they are deprived of important resources and cooperation partners from closer cities.

However, our study also highlights the importance of multi-stakeholder initiatives, as one group of actors alone can hardly manage the complexity of transformative processes. Despite the privileged access of mayors to networks, most farmers were not included in the different steps of the process and, thus, felt left out (Q18, 20). This lack of communication between public and private actors prevented the inclusion of valuable sources of knowledge that could be critical to the success of the initiative; especially because the social innovation output is to be a farm store and many of the farmers are already practicing direct marketing. Therefore, it can be assumed that farmers as cooperation partners have both the expertise and motivation to enter this entrepreneurial field (be present and grow) and should, accordingly, be integrated by public actors ([Weltin et al., 2021](#)).

Regarding the private actor and its capacity for social innovation, we can draw on the literature discussed in "Social innovation capacities of farmers" to identify some important characteristics. Specifically, the farmers show interest and appreciation in collaborating with other actors, recognizing that they perform important tasks for which they do not consider themselves qualified or interested (Q17; [Bruce et al., 2017](#); [Charatsari et al., 2020](#); [Chiffolleau and Dourian, 2020](#)). The farmers' statements imply that the existing social innovation capacity varies widely and is influenced, to some extent, by prior experiences and institutional affiliations.

Our findings indicate that farmers have limited social innovation capacity when it comes to the prioritization of social impact over personal gain. Farmers often appear to be constrained by system logics (Q 2, 11, 12), such as adhering strictly to market rules. Moreover, their reluctance to engage in the process also seems to be rooted in the recognition that social innovation, due to its collaborative nature, transcends individual decisions (which is often not the case with technological innovation). Consequently, there is a need to engage with new forms of networking and actors that may have had little to do with agriculture in the past.

Overall, the farmers interviewed indicated a willingness and/or interest in engaging with their farms to explore a novel model for local supply chains. This indicates that they have identified shortcomings in the current agri-food system or advantages in the alternative food networks offered to them, which motivates them to invest the necessary resources in social innovation. Therefore, this type of multi-stakeholder initiative can be a good strategy that leads to a new and

more sustainable agri-food system. This concept of relinquishing traditional roles and responsibilities during the collaborative process, followed by a subsequent redefinition and consolidation of innovative market orientations, has been explored by [Martens et al. \(2022\)](#) in the context of transformation processes in agri-food networks, particularly in organizational forms that exhibit characteristics of social entrepreneurship.

### 5.3. Study limits and recommendations

At this point, we would like to indicate some weaknesses of the studies and give recommendations for further studies that want to follow our approach.

The main purpose of this paper was to provide a theoretical framework for looking at sustainable transformation processes in rural areas, and particularly the interaction of public-private actors. Thus, the focus is on the conceptual elaboration of proximity dimensions in social innovation processes. The empirical underpinning has been chosen to test this concept. We are aware that the number of cases and the farmers interviewed in these cases is small. However, since there were only a limited number of farmers in the communities, this could not be overcome. Increasing the number of cases would have been at the expense of comparability. There is a need to accompany social innovation processes in more detail ([Dubois, 2019](#)), to show differences between different types of farming, how rural social innovation processes differ from rural-urban social innovation processes or possibly to identify success parameters using proximity analysis to better understand and promote the actions of actors in alternative food networks. Important contributions that can be built upon here are [Gugerell et al. \(2021\)](#) and [Gugerell and Penker \(2020\)](#), as well as the work of André Torre, which show further potentials of proximity analysis that now need to be explored for the field of transformative social innovation research.

We are aware that the topic of sustainable transformation is a complex one. Some authors question whether regionalization and the shortening of food chains are the right way forward. Although we are aware of these criticisms, we would like to note that our study aims to contribute to the debate on the role of regionalization of the agri-food system for sustainable transformation by adding important insights, namely those of local social innovation governance. We believe it would be useful to advocate for research on all potential leverage mechanisms that can bring about sustainable transformation. Another research gap in this context is an in-depth examination of the work of Elinor Ostrom and colleagues on commons resource management. It seems promising to see the extent to which their findings impact the field of social innovation research and what we can learn from their studies to study alternative food networks.

Finally, it should be emphasized that the case studies are rare, as the engagement of mayors in agri-food transformation is the exception in German rural municipalities. It can be argued that the task of promoting the agri-food transition is the responsibility of local publicly elected representatives ([Defourny and Nyssens, 2012](#)), as it touches on several issues of general interest, such as health, nutrition, landscape protection, biodiversity and job preservation. However, the agri-food transformation in Germany is not anchored in the tasks of local authorities and is, therefore, not a service of general interest as are many sustainability issues. Since the two case studies show how

important the institutional affiliation of a municipality is for farmers to become active and often no external actors feel responsible for sustainable transformation, this should urgently change and the lever for sustainable transformation should be politically anchored. The deficits of social innovation processes described, such as a lack of organization and communication, also raise the question of whether these competencies exceed the social innovation capacities of mayors and, therefore, require additional actors.

## 6. Conclusion

The following manuscript addresses the question of how the sustainable transformation of the agri-food system can work at the rural level. The theoretical elaboration looks at the role of multi-actor collaborations and particularly the social innovation capacity of local decision-makers and local farmers as a crucial factor of transformation that has been little explored so far.

With this paper, we create added value on several levels. Firstly, we create an argumentation basis for the different consideration and promotion of innovation and sustainable transformation by taking up and defining the idea of social innovation capacity. Drawing on arguments from social enterprise literature and other studies, we show that different groups of actors bring different capacities for participation in social innovations that initiate sustainable transformation processes. Conversely, these different actors also bring with them important resources that are necessary for sustainable transformation processes. Accordingly, the main question is how to successfully bring the different actors together and master emerging challenges.

Secondly, to bring together the different capacities and resources for social innovation at the local level, we propose the theoretical framework of the proximity level, which we also use as a methodological framework to operationalize the different levels of collaboration and, accordingly, identify strategies to pool resources to promote sustainable transformation better. Using this framework, we were able to show that there are differences in the way proximity shapes social innovation processes. In examining two case studies of municipalities where mayors sought to establish a farm store and, therefore, reached out to local farmers for collaboration, the application of the proximity framework provided a plausible explanation for why farmer commitment to the multi-actor initiative was lacking in one case. Organizational proximity and institutional proximity were too weak (no communication and different administrative affiliation) and were not improved by the mayor or replaced by other proximities. By contrast, it became clear that belonging to the same municipality lowers transaction costs at multiple levels and, thus, facilitates social innovation. This finding also underscores the importance of promoting rural communities as drivers of sustainable change, and anchoring and implementing the agri-food transformation as a service of general interest at the local level.

## Data availability statement

The datasets presented in this article are not readily available because to protect the interviewees we are not able to share the interview transcripts. Requests to access the datasets should be directed to [Katrin.Martens@zalf.de](mailto:Katrin.Martens@zalf.de).

## Ethics statement

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

## Author contributions

KM, SR, and AP: conceptualization, supervision, and writing—review and editing. KM: formal analysis, visualization, and writing original draft. AP: funding acquisition. UH: empirical investigation. KM and UH: methodology. SR: project administration. SR and AP: validation. All authors contributed to the article and approved the submitted version.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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