



# Establishing an Agri-food living lab for sustainability transitions: Methodological insight from a case of strengthening the niche of organic vegetables in the Vestfold region in Norway

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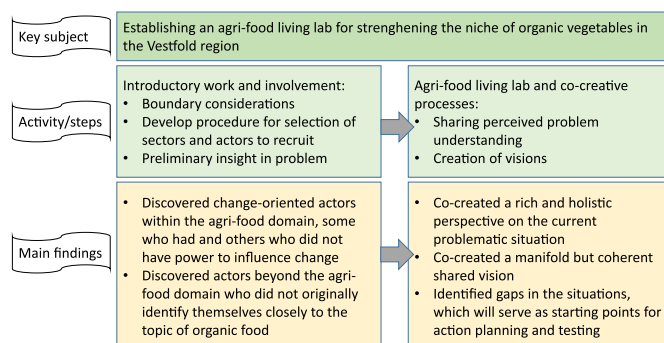
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## HIGHLIGHTS

- Created a system of interest with the purpose of exploring and improving the situation for organic vegetable food systems
- Several different sectors and actors can potentially connect to strengthening of organic vegetable agri-food systems
- Through participatory processes participants co-created a coherent vision that laid the ground for future action planning
- The procedure for discovering and selecting actors within and beyond the agri-food domain can be applied in other contexts

## GRAPHICAL ABSTRACT



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## ABSTRACT

**CONTEXT:** Agri-food systems face complex sustainability challenges, containing conflicting interests, goals, worldviews and fragmented knowledge and decision-making. There is a need for a better understanding of how to turn knowledge about sustainability into actions for change. The complexity of these challenges necessitates systemic, cross-sectorial, and multi-actor processes.

**OBJECTIVE:** The aim of this study was to strengthen agri-food systems associated with organic vegetables in the Vestfold region in Norway by involving actors through a living lab and to generate knowledge regarding the establishment phase of cross-cutting change initiatives. This included exploring how actors from within and beyond the agri-food domain could be selected and recruited and investigating what characterize their perceived understanding of the current situation regarding organic vegetables and their shared vision.

**METHODS:** We first drew the boundary of the living lab “system” in relation to improving the situation of organic vegetable agri-food systems. We explored potential participants by developing and applying a procedure for discovering sectors and actors that could contribute to overcome development obstacles. We then used the snowball sampling method and interviewed 48 actors, identifying 80 potential participants. Among these, 30

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actors participated in a workshop in which we facilitated co-creative processes for creating a common problem understanding and a shared vision.

**RESULTS AND CONCLUSIONS:** The procedure helped identify change-oriented actors within the agri-food domain. Actors represented small-scale entities who had power to influence their own business, as well as individuals within large-scale entities with limited power to influence change in own organizations. We also discovered actors beyond the agri-food domain who did not originally identify themselves closely with the topic of organic food, such as actors from waste management, education, regional, business, and tourism development, and health and welfare. The diversity of actors contributed to a rich and holistic perspective on the current situation for agriculture and food. They co-created a manifold, but coherent, shared vision, portraying a more collaborative orientation in localized agri-food systems. The gaps between current and future desired situations clearly served as a starting point for action planning and testing.

**SIGNIFICANCE:** The study shows crucial steps in establishing an agri-food living lab, including introductory work of bounding the system, selecting actors, and conducting co-creative processes. The study developed and applied a procedure for discovering actors within and beyond the agri-food domain who could contribute to overcoming development obstacles. This procedure can be adjusted and utilized in other settings.

## 1. Introduction

Agri-food systems are globalized and industrialized and face severe and complex sustainability challenges regarding production, processing, distribution, consumption, and wastage (IPES-food, 2016; McIntyre et al., 2009; Thompson et al., 2007). Within the agri-food domain and beyond, knowledge and decision-making are sectorial, specialized, and fragmented. Thus, challenges are not seen in relation to each other (Pigford et al., 2018; Rickerl and Francis, 2004; Senge et al., 2005). In addition, different and subjective perceptions exist regarding what sustainable development is, depending on the backgrounds, values, and worldviews of the actors (Bawden, 2012; Rigby and Cáceres, 2001; Thompson et al., 2007).

The International Panel of Experts on Sustainable Food Systems (IPES-food, 2016) considers agroecological approaches as prerequisites for sustainable agri-food systems: replacing chemical input, having diversified (organic) production, moving toward shorter and alternative food supply infrastructures, and utilizing participatory research approaches. However, a shift in this direction is hampered by key mechanisms that lock industrial agriculture in place, such as the concentration of economic and political power in large-scale organizations within distribution and trade.

The described complexity and “wickedness” of the situation (Rittel and Webber, 1973) complicate attempts to turn knowledge about what is sustainable into actions for change. Consequently, studies are needed that aim at a broader understanding and framing of transition processes that consider whole production and consumption systems and that involve the actors in the learning and knowledge creation process. There is also a need for cross-sectorial and multi-actor approaches acknowledging the influence of power imbalances (Darnhofer, 2014; El Bilali, 2019; Geels, 2018; IPES-food, 2016; Köhler et al., 2019; Meynard et al., 2017; Pigford et al., 2018).

In this regard, systems thinking is purposeful, as it acknowledges the “wholeness” and interconnectedness of elements, phenomena, and problems in natural and social systems (Midgley, 2000). When working with change processes, a system can be understood as a *system of interest*, constructed with a *boundary* according to a specific purpose (Ison, 2017). The boundary separates the system (i.e., the situation we are looking at and want to improve) from its environment. This practice of inquiry is tied to action and learning so that the articulated system can improve the situation. An example of a study investigating the interconnectedness between sectors interacting with stakeholders is the water-energy-food nexus (Halbe et al., 2015). In action research concerning agricultural contexts, the main participants are usually farmers and other actors in the food value chain, along with agricultural extension services (e.g., Chambers, 2005; Cuéllar-Padilla and Calle-Collado, 2011; Darnhofer et al., 2012; Lamine, 2018). Thus, we found that action research needs to take place in the wider value chain and sector contexts, which could presumably contribute knowledge and

capacity in agri-food transitions.

According to Bradbury (2015, p. 1), action research often start with the question: “How can we improve this situation?” arising from affected actors. These are the active participants or co-researchers who seek solutions to improve the situation and co-create knowledge. As part of the introductory work of action research, starting a process of problem identification is essential, as is a thorough selection of change-oriented actors (Greenwood and Levin, 2006). Turner et al. (2020), propose that including incumbent actors in innovation platforms and making the conflicts of interests visible could contribute to a change in role perception and power relations. Regardless of how the actors are selected, decisions about which actors to include affect both the process itself and what emerges from an intervention in the short and long terms (Midgley, 2000). The actors are to be involved at all stages in the change process, as participatory processes have been shown to give added value, such as heightened awareness, ownership, trust, enhanced social learning, empowerment, and commitment (Darnhofer et al., 2012; Greenwood and Levin, 2006; Wittmayer and Schöpke, 2014). The next step in the change process (after the introductory work) includes collective exploration of the perceived problematic situation and its causes and creation of a shared vision of the desired future situation (Greenwood and Levin, 2006; Loorbach, 2010). Cases with divergences in worldviews regarding a specific situation might lead to multiple non-coherent understandings and visions (as found in Halbe and Pahl-Wostl, 2019). Different worldviews, such as the nature of a sustainable development, might complicate agreement on an action plan because of disagreements regarding the desired situation and development pathways. Involving sectors beyond the agri-food domain, might prevent participants from creating a coherent vision regarding the specific niche. This is because some participants may not be directly affected by the changes in the situation and may have no in-depth knowledge about the topic in question and less initial awareness.

One way of supporting broad collaboration for development and innovation is by organizing “living labs.” A living lab is an open innovation platform approach, usually temporary and bounded by the purpose it was created for, which is to develop new products, services, technology, systems, and processes (Bulkeley et al., 2016; Leminen et al., 2012; Steen and van Bueren, 2017; Zavrtnik et al., 2019). Living labs can be used in various contexts, including sustainable urban and rural development and transitions. These are often termed “Urban Living Labs” (or rural) and are embedded in geographical contexts. This embeddedness in the territory or community can apply to transitions in food production and consumption, as these occur in specific place-based contexts. Ideally, Urban Living Labs are characterized by: a) actors from all actor types in the quadruple helix (i.e., public, private, and knowledge institutions, along with civil society and users) in the relevant region; b) co-creation during the entire development and innovation process (i.e., from visioning, generating ideas, to testing and experimenting, and evaluating and learning); and c) facilitation of processes,

connection of actors, and coordination of activities. Place-based living labs can facilitate the mobilization of actors and the connections of top-down and bottom-up initiatives, as well as enhance collaboration between sectors, such as local food, transport, and energy (Bulkeley et al., 2016; Hvitsand and Richards, 2017). In the present study, the term Living Lab is used for these types of place-based approaches.

Examples of living labs occur in agri-food contexts (see labs in the European Network of Living Labs (ENoLL, 2021), and in the Horizon project FIT4FOOD2030, for example). Place-based living labs have been used in initiatives such as reactivation of the agrarian sector (García-Llorente et al., 2019), and in regional development, with a focus on agriculture and food in broader socioeconomic development contexts (Fèche et al., 2021; Kobzeva and Knickel, 2018). Recent articles have explored and conceptualized the use of place-based living labs emphasizing the need for real-life experimenting for sustainable development and innovations in agri-food systems (Gamache et al., 2020; McPhee et al., 2021). This literature mainly focus on agriculture/production as “users,” though including consideration of the end-user and citizen actions as well. We find that in-depth research into the establishment of living labs for agri-food sustainability transitions could add valuable insight to the emerging body of studies on living labs that relate to agri-food sustainability. This includes how the selection and recruitment of participants to living labs could be conducted, by including participants from other sectors and along whole value chains, as well as the co-creative processes that could be adopted to make a joint platform for creating changes.

To merge the knowledge from the living lab and action research literature and illustrate the stages of a place-based living lab project, we have designed Fig. 1 (Bulkeley et al., 2016; Greenwood and Levin, 2006; Hvitsand and Richards, 2017; Ison, 2017; Midgley, 2000; Steen and van Bueren, 2017; Wittmayer and Schöpke, 2014; Zavrtnik et al., 2019). The figure illustrates the introductory work of researchers gaining insight into the problematic situation and selecting participants for the purpose of the change initiative, and the participatory processes for creating a common problem understanding, creating visions for the desired future, generating ideas for targeting the shared vision, selecting actions and planning them, testing “solutions” and innovations, and finally reflecting and learning in all steps. This is an idealized illustration, and real-life processes are not linear. This study will only look at the introductory work and the creation of a common problem understanding and a shared vision.

In Norway, rising consciousness about the sustainability aspects of food systems has increased the demand for organic, local, and fair products, including vegetables, and growth in local and alternative food networks (Hvitsand, 2016; Leikvoll et al., 2020; Milford et al., 2019). Dissatisfaction among consumers has been reported for the grocery selection of fresh and organic produce (NOU 2011:4, n.d.). Despite some national efforts to increase organic vegetable production and consumption (e.g., subsidies and project grants), the share of organically grown vegetables in Norway is still small, and consumption is mostly from imported goods (Norwegian Agriculture Agency, 2019; Skjelvik et al., 2017). According to Norwegian expert reports, obstacles to the development of organic vegetable production and consumption relate to several factors, such as the contemporary agronomic practices and specialization of production, the labor and skill intensiveness of organic vegetable farming, and the competitive and disconnected market situation where a need exists to connect supply and demand (Milford et al., 2016; Milford et al., 2019; Ministry of Agriculture and Food, 2011; Serikstad, 2016). Additionally, a few large-scale actors dominate the food supply chain. This has been problematized, as these actors function in vertically integrated collaborations and ownerships along the value chain, and they decide important aspects, such as producer and product market entrance opportunities, assortment, and price (NOU 2011:4, n.d.). Another potential obstacle for the development of organic food could be the perception that Norwegian and “local food” is equivalent to “sustainable food”; thus, the preferences for organic food could be less strong (Leikvoll et al., 2020).

The region of Vestfold and the surrounding area, where an agri-food living lab was established, consist of both rural and urban areas. A large share of the domestic vegetable production, including that certified as organic, occurs in this region. The agricultural department at this County Governor’s office had allocated state-financed resources as a “national pilot county” from 2010 to 2018 to increase organic vegetable production and consumption (Skjelvik et al., 2017). The agricultural department worked with both the large-scale and long food supply chains (such as wholesalers, public institutions, and chain hotels), as well as the small-scale and short food supply chains (such as alternative food networks like Community Supported Agriculture). The department also financed knowledge reports about agronomic barriers to increased production and stimulated agronomic competence environments for organic production in the Agriculture extension service. It organized and financed cooking courses for chefs at commercial kitchens and in the

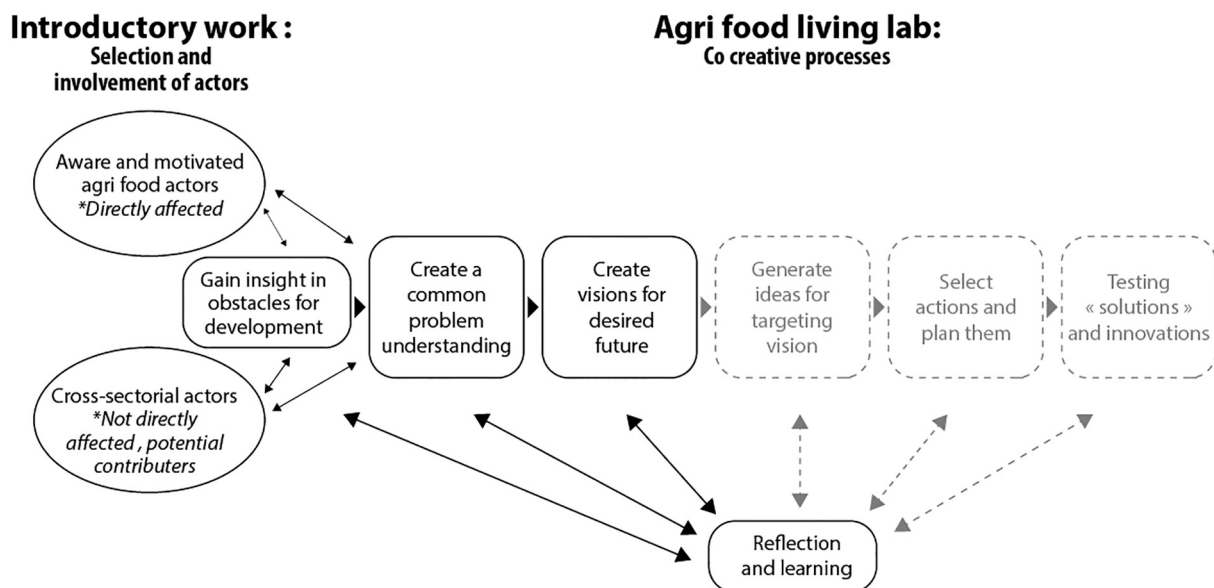


Fig. 1. Participatory and co-creative process for development and innovation, illustrated according to a merging of action research and place-based living lab literature.

educational sector, while also creating more contact between actors in the value chain. Despite these diligent efforts by the agricultural department to build networks and to reduce development obstacles, these endeavors have not resulted in the desired increase in the production and consumption of regional organic vegetables.

Thus, the aim of the present research project was to initiate a structured transition process that would strengthen agri-food systems of organic vegetables in the Vestfold region by involving actors in a place-based living lab. A further aim was to generate more knowledge regarding the establishment phase of this type of change initiative. This included sharing our experience about how we selected actors and conducted the involvement of actors in the co-creation of knowledge. We asked the following research questions:

- How do we discover and select sectors and actors to be involved in developing innovations in organic vegetable agri-food systems to overcome obstacles and discover overlooked opportunities?
- What characterizes the perceived understanding of the current situation regarding organic vegetables and the shared vision for the future in this cross-sectorial and multi-actor process?

This part of the study looks at the initial phase of the living lab process, while the planning of actions and innovations, as well as testing and experimenting with these, will be presented elsewhere. Still, the living lab itself can be considered a way of experimenting with sustainability transitions. We posit that new and overlooked collaborative opportunities will emerge by taking a cross-sectorial and multi-actor approach. Further, we posit that bringing the actors together to share knowledge and perspectives in structured, participatory, and co-creative processes will build capacity, create actionable knowledge, and empower future collaborative activities (Luederitz et al., 2017).

## 2. Methodology

In the following, we describe the research strategy and steps for initiating the agri-food living lab and the methods used for data collection and analysis throughout these steps.

### 2.1. Action research strategy and the researchers' role

The study was initiated by the agroecology group at the Norwegian University of Life Sciences (NMBU), with the support of the Vestfold County Governor's agricultural department. The first author initiated an agri-food living lab in the Vestfold region in Norway in the winter of 2017/2018. The research we describe in this study was the start of a long-term action research project aimed at co-creating collective actions and innovations to be tested in real life. The role of the researcher was to engage in creating actual changes in the real situation and to develop new knowledge in association with the participants (Levin and Ravn, 2007). The first author had pre-knowledge about the specific context, the problematic situation, and the regional actors through previous projects and networks in the agri-food domain and beyond, and this knowledge was used actively in the study. For instance, the researcher had previously been involved in research in the region involving several topics, such as health and welfare, sustainable tourism, waste management, and circular economy. From this vantage point, the first author saw the opportunity of constructing interlinks between the niche of organic vegetables and other relevant sectors. The researcher had also studied the emergence of Urban Living Labs in Norway and recognized that this concept could be utilized in action research projects for sustainable development in agri-food systems.

Fig. 2 illustrates the stepwise procedure applied in establishing the living lab. The steps resulted in the researcher and the actors increasingly obtaining more knowledge about the current and desired future situation and which persons could contribute to the change initiative. The boundary of the system of interest was first defined. We then gained insight into the current problematic situation and which potential actors to recruit, while involving the actors in reflections. Subsequently, we facilitated participatory processes with co-creation of knowledge, while also conducting participant evaluations and writing researcher's reflections based on observations. The following sub-chapters explain which activities were conducted and how data was collected and analyzed. The research questions were answered through a mix of methods and data to strengthen the validity of findings (Yin, 2013).

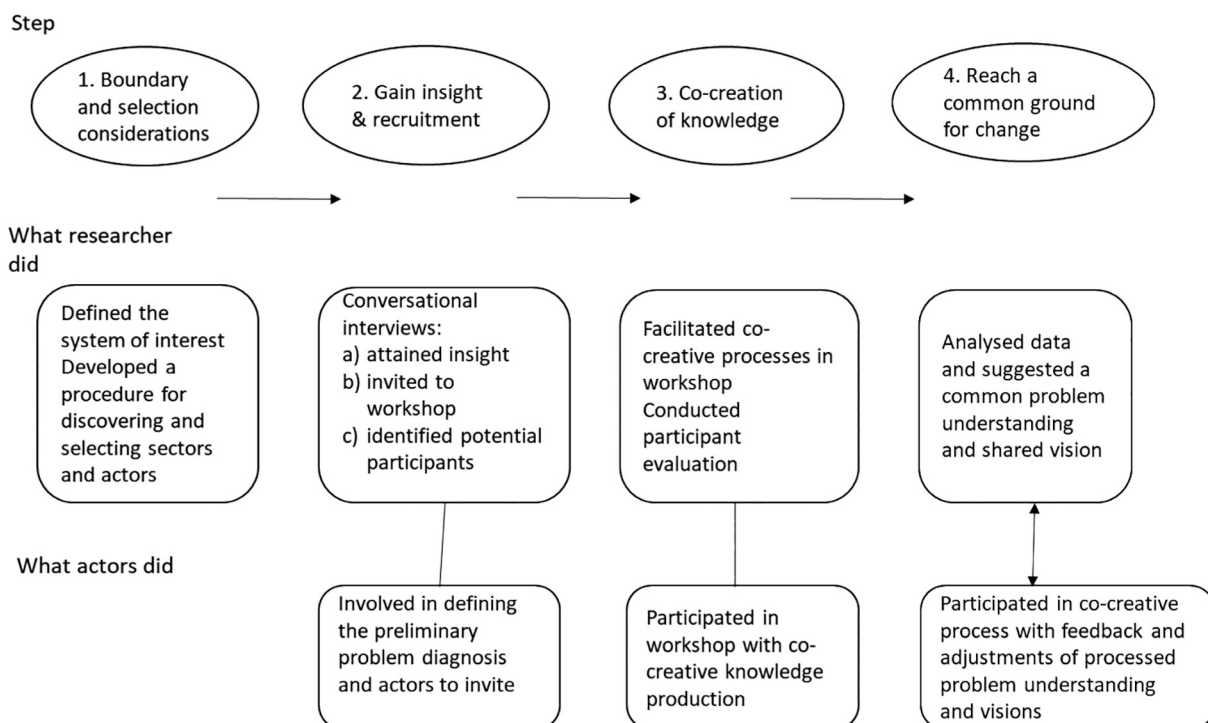


Fig. 2. Activities for establishing the agri-food living lab (steps 1–2 were related to the introductory work, steps 3–4 were related to the co-creative processes).

2.2. Bounding the system of interest and actor selection considerations (Step 1)

As in other studies, we took the problematic situation as a starting point for identifying actors (Halbe et al., 2015; Muller et al., 2012). We needed to construct the system of interest that bounded the situation we wanted to explore and improve (Ison, 2017). In our case, the system was constructed with the purpose of strengthening the sustainability of agri-food systems, taking an agroecological approach to define sustainability (IPES-food, 2016) and using the case of organic vegetables. We considered the following regarding the system of interest, and who to invite to the living lab:

The first consideration was actors from the agri-food domain: As described in the introduction, the Norwegian food supply chain is characterized by a dominance of a few large-scale actors. This structure was considered to form a part of the obstacles to the development of organic agri-food systems. Thus, the perspective of power was essential to consider when drawing the boundaries of our system, as change-resistant actors might hamper the change processes (Avelino, 2017; Kemmis and McTaggart, 2005). Therefore, when inviting participants to the living lab, we viewed the creation of what Smith and Raven (2012) call a “protective space” as crucial for shielding, nurturing, and empowering open-minded thinking. Creating this type of space for those who agreed with the need for (radical) changes was assumed to foster trust, openness, and a creative exploration of alternative perspectives and visions. Therefore, we did not include incumbent agri-food organizations in the boundary of our system of interest, apart from the truly change-oriented individuals within these organizations who could identify with the need for change. The decision to exclude change-resistant actors was discussed within the agroecology research group, as well as with some of the interviewees (see section 2.3), who confirmed that it could prevent the process and changes.

The second consideration was actors from sectors beyond the agri-food domain: We explored potential cross-sectorial collaborations by the researchers asking the following underlying questions that would allow us to reflect on how to incorporate additional sectors and actors: Which additional sectors and their challenges could benefit by connecting to the organic vegetable agri-food systems? Which institutions or actors could it be purposeful to include from these sectors? From these overarching questions, we developed and applied a procedure for identifying collaborative opportunities, which also stretched beyond the agri-food domain (Table 1). The identification of challenges and obstacles evolved from the literature and the researcher’s previous knowledge and was developed further through interviews and snowball sampling.

From the defined system of interest, Table 1, and the perspectives presented in the introduction, the selection criteria for invitation to the agri-food living lab were as follows:

1. Direct attachment to and dissatisfaction with the current situation of organic vegetables; thus, being change-oriented and potentially motivated to participate.

Or:

2. Belong in another sector that could contribute to development by reducing or bypassing identified barriers, while at the same time addressing challenges in their sector or job mandate.

In addition:

3. Personal traits that could contribute positively to the collective process, including open-mindedness, communication ability, reflectiveness, and ability to agree on the frames for collaborative processes (Vidal, 2004).
4. Ability to contribute to diversity regarding formal roles, knowledge, perspectives, and decision-making processes (quadruple helix).
5. Belonging to the Vestfold region.

The most central actors are those in the food value chain, as they are the ones who can decide whether to produce or buy more organic vegetables (if food entities selling to or serving consumers also represent conscious consumers). This not only included those who were organically certified producers and traders, but also those with a strong emphasis on sustainability. Those supportive of these types of developments from public and knowledge institutions were also considered to have important roles (Loorbach, 2010; Steen and van Bueren, 2017).

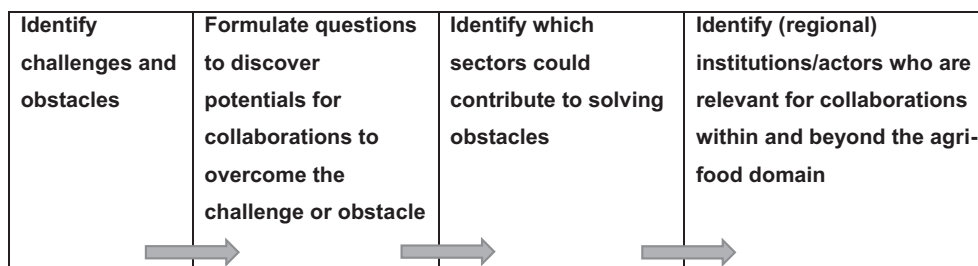
2.3. Approach for gaining insight and recruiting to the workshop (Step 2)

In the next step in the introductory work, we wanted to gain preliminary insight into the situation in the region to lay the foundation for the preparations of the workshop and the co-creative processes (step 3).

Potential participants were contacted for a combined invitation and conversational interview (Greenwood and Levin, 2006). The purpose of these were fourfold: a) to attain more knowledge about the current situation (i.e., the entities’ characteristics and tasks, existing networks, collaborations and channels, and considerations regarding challenges and opportunities for increased production and consumption of organic vegetables); b) to inform participants about the upcoming workshop and personally invite them to participate in the change initiative; c) to collect suggestions about other actors who could contribute to and benefit from participating, and d) facilitate early involvement of potential participants. The interviews’ informal format constituted a dialogue between the researcher and the interviewee. Regarding the actors beyond the agri-food domain, this dialogue also consisted of reflecting on the relevance of the initiative for them.

This round of interviews and snowball sampling (Leventon et al., 2016) started with the employee at the County Governor’s agricultural department in charge of the then ongoing state-financed “national pilot county” project (see introduction for information about that project).

**Table 1**  
Procedure for discovering potential cross-sectorial collaborations and actor selection: moving from development obstacles to questions for potential cross-sectorial collaborations and then to the identification of relevant sectors and regional institutions/actors.



**Table 2**

Number and composition of interviewees, workshop participants, and combined interviewee and workshop participant, grouped according to the quadruple helix model.

Organization	Conversational interview	Workshop	Both interview and workshop
<b>Private organizations</b>			
Organic farm	13	8	4
Conventional sustainability-oriented farm	1		
Farmers' unions	2	1	1
Farmer's market		1	
Food entity	6	2	2
Food start-up entity	1	1	
HORECA apprentice support organization	1		
Sustainable solutions consultant	1	1	1
Work inclusion and training entity	1		
Sum private organizations	28	14	8
Percentage of interview / participant group	58%	46,5%	42%
<b>Public organizations</b>			
County Governor's agricultural department	3	3	2
County municipality's regional and business development department	1	1	1
Public entity for innovation and for start-up support	2	2	2
Public owned tourism development entity	1	1	1
Inter-municipal waste management entity	1	1	1
Municipality's agricultural department	1	3	1
Municipalities' support of start-up	1		
Public vocational education	2		
Sum public organizations	12	11	8
Percentage of interview / participant group	25%	36,5%	42%
<b>Civil societal organizations</b>			
Organization for young entrepreneurship	1		
Social development organization	2	1	1
Organic food festival	2	1	1
Environmental organization	2		
Sum civil societal organizations	7	2	2
Percentage of interview / participant group	15%	7%	11%
<b>Knowledge organizations</b>			
Agricultural extension service	1	1	1
Research organization		2	
Sum knowledge organizations	1	3	1
Percentage of interview / participant group	2%	10%	5%
<b>Total</b>	<b>48</b>	<b>30</b>	<b>19</b>
<b>Total number in interview and/or workshop: 59</b>			

Then followed actors in the value chain found by using the database of Debio; the organization that certifies organic producers and sellers (debio.no), web pages and Facebook pages and groups. The researcher added relevant actors from own network. In total, 48 persons were contacted and interviewed through this process, and a total of 80 potential participants from different sectors and institutions, including those being interviewed, were identified and invited.

The interviewees (see Table 2) comprised several organic and other sustainability-oriented farmers (including two large-scale farmers), and persons from the farmers' unions, Farmer's market, food entities (including shops, chefs, and change-oriented actors in large-scale incumbent entities), Agricultural extension service, the county municipality, the County Governor's office and municipalities, as well as actors within entrepreneurship, education, tourism development, and inter-municipal waste management, along with societal development and environmental organizations. A social and work inclusion entity was also interviewed.

The interviews were semi-structured and lasted between 30 and 90 minutes. Most interviews were conducted by telephone, but a few were face-to-face. Telephone interviews functioned well, perhaps, in part, because the researcher had been in touch with several of the interviewees in previous projects.

Overall, 47 of the 48 interviewees applauded the change initiative, but for different reasons. All interviewees were invited to the workshop.

The large-scale farmers stated that they were bound to delivery agreements to the large-scale food supply chain actors and had little flexibility, while others were committed to their "Community Supported Agriculture" members. Small-scale and self-employed actors in agriculture and food entities expressed that they simply did not have time to participate. A few reasoned that they had previously found participating in meetings to be interesting but unproductive. Still, some of these actors decided to participate, as they appreciated the reciprocity of participating that the researcher was communicating during the interview.

#### 2.4. Workshop with participatory and co-creative processes (Step 3)

A full day living lab workshop took place at the County Governor's venue with 30 participants (out of the 80 identified). Of the 30, 19 had been interviewed beforehand, and 11 were additional. This is a suitable number of participants for the processes to be accomplished (Vidal, 2004), and they came from a diversity of entities. Participants were from organic farms, Farmer's market, a farmers' union, food processing, small shops, and a sustainable solutions consultant. Participants from public institutions were from the agricultural department of the County Governor's office, the regional and business development department of the county municipality, Innovation Norway, municipalities, an entity for entrepreneurial support, an inter-municipal manure and food waste biogas plant, and a tourism entity (geopark). An organic food festival

and a regional 4H organization were also represented. When it came to knowledge institutions, NMBU had two participants (one was the fourth author), in addition to the main facilitator (first author) and co-facilitator. The Agricultural extension service also participated.

Table 2 shows the interviewees (described in section 2.3), the workshop participants, and the ones who were both interviewees and participants, grouped according to their actor type in the quadruple helix model. In total, 59 persons were interviewed and/or participated in the workshop.

The participants were divided into five mixed groups and were reshuffled midway in the program. An introductory session, including a getting-to-know-each-other activity, was followed by presentations about the previous endeavors and activities undertaken in the region regarding organic vegetables (by the County Governor's agricultural department) and a presentation of the (researcher's) preliminary understanding of the current problematic situation, including regional agri-food structures, from the introductory work.

Two sessions of participatory and co-creative processes then followed, where the participants were asked: 1) to enrich the understanding presented about the current situation—this was done to obtain a complete picture of the situation, as perceived by the participants—and 2) to create visions about the situation for organic vegetables 10 years into the future.

The participatory sessions were structured and governed according to tools for fruitful dialogue-based processes (Hannevig and Parker, 2012). The participants were asked questions relevant to 1) and 2) above, and in both sessions, they first reflected individually (and wrote notes) before sharing their reflections in the groups, and then the groups presented in plenary. The process of visionary thinking utilized tools and steps provided by Pool and Parker (2017) and Vidal (2004). The participants were encouraged to think openly and creatively about the future, transcending current restrictions regarding what was feasible and their formal roles, and the groups made poster visualizations of the future state that captured the visions of each group member.

At the end of the workshop, we conducted an anonymous evaluation to obtain feedback on what the participants particularly liked and what they would have done differently regarding the living lab workshop. The aim of the evaluation was to reveal whether the participants had views that were relevant to the research questions and to determine their opinions regarding the participatory way the workshop had been designed. The questions presented to the participants for responses were openly formulated to avoid leading or restricting their feedback.

The posters and the written notes from the participants, along with the evaluation notes, constituted data from the workshop. The researcher also observed and wrote reflection notes during the group presentations and shortly after the workshop, focusing on observations relevant to the research questions and the participant interactions.

## 2.5. Data analysis

We utilized the "Procedure for discovering potential cross-sectorial collaborations and actor selection," shown in Table 1, for the identification of sectors and actors to include in the system of interest and the living lab. The content was obtained from what was known about obstacles from the literature, as well as the researcher's previous knowledge and experience in relevant fields. The interviews and the snowball sampling method involved the actors in this process, and the procedure resulted in an overview of obstacles and potential sectors and actors that could be involved within and beyond the agri-food domain. During the conversational interviews, the researcher collected views and thoughts regarding what possible cross-sectorial collaborations could be about. A basic content analysis was used to categorize the data material from the introductory work.

The main data source for researching the common problem understanding and creating the shared vision was the participants' notes from the two participatory processes in the workshop, which were also

reflected in the vision posters. The participants' notes were sorted into areas of concern related to the current situation and future desires. The first author was responsible for this initial sorting. From the process, six areas of concern emerged using an explorative way of coding (Saldaña, 2016). This was done without weighing the different aspects as the purpose was to show the diversity of perspectives. An example of this process is given in Fig. 3.

The content of the areas of concern and the coding were influenced and supported by problematic areas described in expert reports (see introduction) and interviews to compensate for those unable to participate on that day. The areas of concern were structured into a schematic illustration of the perceived problematic situation and the corresponding changed situation (visions), thus showing the gap between them and where the action planning, testing, and innovations can emerge later in the change process. Two months after the workshop, the illustration was shown and elaborated to the participants in the follow-up workshop, followed by a participatory process of "approvalment," additions, and adjustments. The illustration was then adjusted following their feedback, and the adjusted version is what is presented in the Findings section.

## 3. Findings

### 3.1. Exploring sectors and actors to include in the system boundary

This subsection provides findings concerning the first research question regarding how we discovered and selected sectors and actors who could be involved in strengthening organic agri-food systems.

#### 3.1.1. Change-oriented actors within the Agri-food domain

The interviews showed that several actors, both outside and inside the dominant value chains, were not satisfied with the current situation. In the following, we illustrate the reasons why we considered these actors to be motivated for change and were included in the boundary.

The interviewed small-scale farmers were interested in improving the current situation regarding organic vegetables and distanced themselves from the way the food system functions today. At the same time they found local sales and distribution challenging and laborious. The farmers highlighted a concern for taking care of the soil, biodiversity, food security and balancing ecology and economics on the farm. The farmers used words like "regenerative farming," "market garden," and "food quality" to frame their thoughts about sustainable farming, and most of them actively participated in different related thematic groups, including on social media.

A common concern among these interviewed farmers was that a disconnection existed between producers and consumers. Therefore, they preferred to reach out to a regional market with short food supply chains, although the logistics of products was raised as a common challenge. Simultaneously, and presenting a window of opportunity, small sustainability-oriented shops, Farmer's market organizers and the like, explained the difficulty in finding local organic vegetables to sell or utilize, and they wanted this situation to improve by connecting to farmers.

The larger-scale vegetable farmers in the region had contracts with large-scale food supply chain actors. The two large-scale farmers interviewed expressed that this prevented them from also selling elsewhere. One called it a challenging way of selling: It was an economic problem for them if the prices changed and more vegetables were imported, potentially at the expense of their products. Still, this farmer wanted to develop regenerative farming skills and was interested in local food distribution.

Regarding the inclusion of dominant large-scale market actors in the living lab (presumably not referring to the farmers referred to just above), one actor expressed:

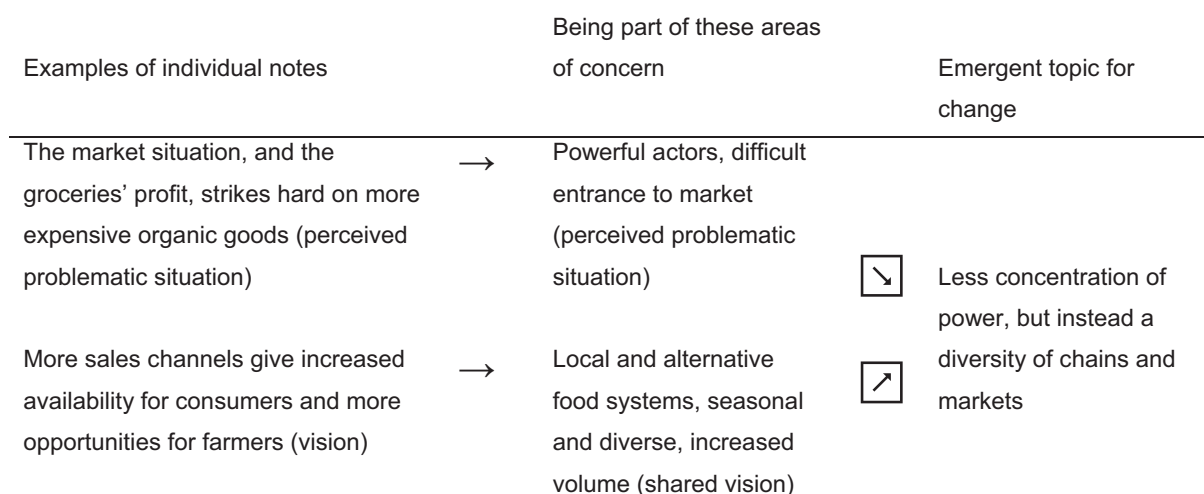


Fig. 3. Example from the analysis process from individual notes to areas of concern to emergent topic for change.

It is difficult for new farmers to get entrance to the market through the regular actors.... There have been several meetings where the large-scale food actors have been present about getting more local organic vegetables into the grocery chains, but it is not getting anywhere. These are key actors; they have a lot of power. If they are there (in the workshop), maybe others don't dare to say things in the group.

Still, we discovered and interviewed employees within large-scale processing and retail entities who wanted to see an increase in the share of locally produced organic vegetables in their turnover but implementing those changes within their organizations was difficult. This can be illustrated by the following statement by a middle leader:

There should be offered more local, organic vegetables, but those making decisions in my organization do not agree on that, so I will not participate in the workshop.

For these reasons, also another employee in a large-scale entity doubted the effect of participating because of the employee's previous efforts to make the company promote organic vegetables without luck.

The above shows that change-oriented actors to be included within the boundary were found both outside and inside the dominant and large-scale value chains. Whether these actors were motivated to participate was often related to their available time and the perceived benefit of participating. Belonging within the more dominant agri-food structures could signify a lack of motivation to participate, even if an employee might personally be change-oriented, because of a perceived disempowerment to create the desired changes in the incumbent organizations (brought up in section 2.2.).

Through the participants' workshop evaluation, we saw a desire for more farmers and value chain actors to participate. A few participants also suggested that large-scale food chain actors and conventional producers should have been present. For example, one participant wrote:

Where is the blockage? It's said that the organic production is too little, but there is a lot of produce in stock. Why? Invite Norgesgruppen (*pres: a large-scale umbrella chain actor*) and have them tell what they need. Everyone can't deliver to the food chains, and everyone cannot do "local production." Maybe they (big and small) should work closer together.

This statement suggests another boundary than the applied one and illustrates that views differ on how to select actors for these types of workshops. The potential risks of including the powerful agri-food actors are considered in the Discussion section.

### 3.1.2. Sectors and actors beyond the Agri-food domain open for collaborations

Table 3 shows the challenges and obstacles to developing organic vegetable production and consumption, and the sectors and actors beyond the agri-food domain who could be included in the system of interest, together with actors within the domain. Collectively, these actors could contribute to "solving" obstacles in potential mutually beneficial collaborations. The content in Table 3 evolved from the researcher's experiential and theoretical knowledge and was developed further through the interviews and the snowball sampling method – all data sources influence, to varying degrees, the substance of all the obstacles.

A need exists to improve the *fertility of soils* in vegetable production. This can be done through collaborations between vegetable farmers and husbandry farmers involving crop rotation (husbandry farming falls strictly within the agri-food domain, but its producer community is often separated from that of vegetable producers). The waste management sector can also contribute, and the inter-municipal waste management (biogas plant) expressed the following perspective regarding connect- edness to organic vegetables and the contributions of organic fertilizers:

...increasing the use of bio-fertilizer, have more local production and less import. If the fertilizer produced at the plant achieves organic certification, it could increase the production of climate-friendly vegetables in the region.

The obstacles to development regarding *labor intensiveness and the need for agronomic skills* in vegetable production are core to the tasks of the Agricultural extension service and the agricultural vocational education. The interviews revealed an existing collaboration between the extension service and organic vegetable producers, but the vocational education in the region has placed little emphasis on the needs of organic vegetable producers.

Different obstacles are related to an entry of locally produced vegetables into the large-scale food supply chains and most of the interviewed farmers have an unwillingness to deliver to these chains. Rather, the participants had a desire to sell and buy more locally, and we interpreted this to represent a need to develop *new regional markets* for sellers and buyers to meet. Both researchers and the interviewees suggested that several sectors and actors could play a role in this: different named food entities, public and private actors within the breadth of business, regional, tourism, and *entrepreneurial* development. In the interview, an employee at the regional office of the public entity supporting business innovations expressed a desire to participate to communicate about their funds' relevance to innovations related to organic production. The leader of a publicly funded entity for



**Table 3**  
Potential collaborative sectors, institutions, and actors that could connect to developing organic vegetables.

Challenge/obstacle	Questions to discover potentials for collaboration	Relevant “new” sectors	(Regional) institutions/actors relevant to cross-sectorial collaboration
The need for more crop rotation collaborations and organic fertilizer	Who can help increase crop rotation and supply with organic fertilizer?	Husbandry farmers, waste management, education	Farmers, farmers’ unions, agronomy education institutions, Agricultural extension service, inter-municipal waste management (biogas)
The labor intensiveness, the need for good agronomic skills	Who can engage in skills development and farm work?	Education, recruitment, health, and welfare (inclusion, job training)	Farmers, farmers’ unions, Agricultural extension service, agronomy education institutions, social and work inclusion, and training entity
Development of new markets, including more contact between farmers and consumers	Who can comprise new markets for organic vegetables? (Also being a base for increased production)	Hospitality, visitor/tourism, public entities (with kitchens), education	Farmers and food entities*, Farmer’s market, farmers’ unions, municipalities, regional authorities, and development actors, including tourism, public institutions (schools, kindergartens, health, and elderly care, etc.), chef and food education institutions
The need for entrepreneurial thinking and the potential need for funding or other support	Who can provide funding and support innovation?	Business and regional development, entrepreneurship competence	Farmers and food entities*, farmers’ unions, regional authorities and development actors, municipalities, entities for support of innovation activities, entrepreneurship, start-up, and networking environments
The need to find collaboration on logistics, connecting supply and demand more directly	Who can connect supply and demand here through logistics?	Health and welfare (inclusion, job training)	Farmers and food entities*, social and work inclusion entity

\*By food entities, we mean restaurants, commercial kitchens (private and public), small, specialized shops, grocery stores, food cooperatives, markets, etc.

networking support among entrepreneurs also did likewise. Aside from representatives from the County Governor’s office, an administrative representative from the county municipality wanted to participate, highlighting that agriculture is an integrated part when planning for regional and business development. Regarding collaboration with a regional visitor and tourism entity (a geopark), the following was expressed by the manager:

We would like to collaborate with more businesses and producers that visitors can come to, stay at, eat at, and buy local food from. This is something we struggle with achieving, like many others who have

an engagement with local food, and this is also an important part of sustainable tourism.

The welfare sector, with its focus on work training, and long-term work inclusion through education, could connect to the need for competent labor in farming, as well as the need for *logistics* for regional distribution in new markets. The manager at a work inclusion and training entity summarized the conversational interview this way:

We are interested in and open to collaborations and development work. I’ve heard about collaborations with food initiatives before,

and we are continuously in search of meaningful work for the trainings.

Corresponding to this, several of the farmers and food entities, including start-up food entities, stated concerns about and revealed engagement in social and work inclusion issues, and a few even had some experience with this related to their need for labor.

These statements from the interviews show that the selected actors from “other” sectors do not necessarily have a passion for organic farming or food itself, but their interests could be connected to the intentions of the living lab in a way that could result in mutual advances.

The conversational form of the interviews with the actors seems to have been crucial for their interest in exploring potential collaborations, as these actors did not directly see the relevance of their participation. The conversations allowed the researcher and the actors to reflect together on the relevance of the development of organic vegetables and their interaction with the mandate or task of their entity; this seemed to create an engagement and curiosity. The participants’ evaluations at the end of the workshop seemed to indicate that, in general, they were satisfied with the diversity of the actors present.

### 3.2. Problem understanding and shared vision

This subsection presents findings for the second research question regarding what characterizes the perceived problem understanding and shared vision created with diverse actors. This part is a further step in the emergent understanding, knowledge, and reflections of the situation among all involved. But first we render some insight about how the workshop was perceived:

The following quote about the interactions between the participants is based on the researcher’s observations and reflection notes from the day:

The atmosphere was very friendly, open, and the people were eager to talk at the tables. After breaks, I had a hard time getting the participants back into the room. When I signaled that the break was over, they wouldn’t stop chatting and exchanging contact information, views, and ideas. Also, it didn’t seem like anybody had the need to stand out.

In the anonymous evaluation, several participants also commented

that they were positive about the workshop and pointed to the value of including people with different knowledge and backgrounds. The County Governor employee, who had been working on strengthening organic and local foods for several years, later expressed orally:

The invitation process and format, it managed to get many to participate in the workshop. Often, it is a struggle to get people in, and it is hard to be creative in how to do it.

Still, there was a bias toward the participation of public entities compared to those who were interviewed ahead of the workshop (especially self-employed farmers and food entities), as illustrated in Table 2.

The coding of the participants’ notes from the two participatory sessions in the workshop, complemented by the data collection during the introductory work (section 2.5.), identified six areas of concern regarding the current problematic situation and the corresponding changed situation (vision). Although the content is not in direct correspondence, it is closely related. The following were labeled as emergent topics of change: 1) Aligned attitudes regarding sustainability between organic and conventional farming, 2) Sustainable agricultural practices, 3) Less concentration of power, but instead a diversity of chains and markets, 4) More collaborative and less competitive orientation, 5) Increased knowledge, insight, and awareness among consumers, and 6) Increased quality of life and availability of healthy foods. Fig. 4 shows, in their analyzed form, the related categories of the current problematic situation and the visions for the future situation from which the topics emerged. Interestingly, one item of feedback from the workshop evaluations was that the participants, despite their varied backgrounds, found that their visions for an optimal society were surprisingly similar.

A lack of understanding of the organic farming perspectives by conventional actors was perceived as frustrating (1,2). Rather than antagonism between different views, the desired future situation was that all agricultural practices would enhance sustainability through knowledge exchange and remove the need for organic certification. Issues of unsustainable agricultural practices and lack of holistic thinking were a pressing present-day concern. According to the vision, sustainability is achievable in all production steps in the form of reduced wastage and climate gas emissions and more circularity, diversity, and suitable technology.

Today’s globalized and highly competitive markets, with a few

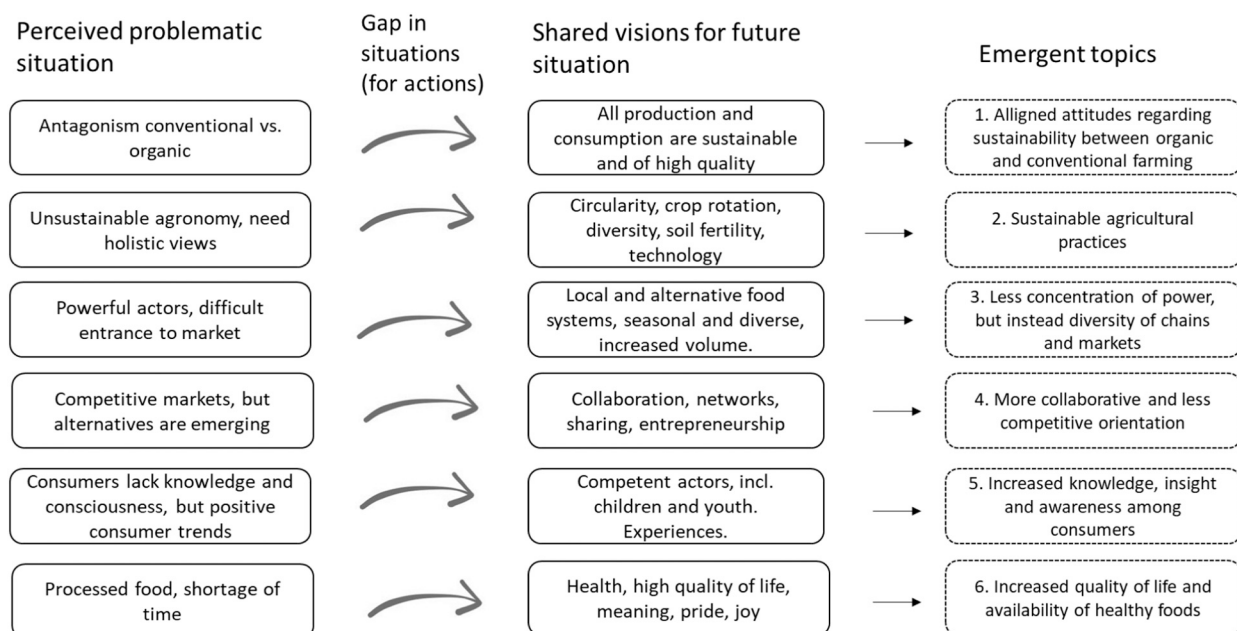


Fig. 4. The perceived problematic situation, the corresponding shared vision for the desired future situation, the gap in situation, and the emergent topics for change.

dominant and powerful actors, were also perceived as hindering entry of locally produced vegetables into the market and discouraging an increase in production and consumption (3, 4). The current market situation was unpredictable, and the existing structures disconnected producers and consumers, even though both parties wanted to sell/buy more organic and local produce. Thus, in the future, collaborative networks, small-and large-scale producers, and local food systems can contribute to a livelihood for farmers, high production in the region, and seasonal eating, thereby reducing the need for imports.

The consumers' alienation, gullibility, and lack of knowledge of ecology and food quality was a current concern, as was the knowledge of the use of these vegetables by cooks (5, 6). Public sectors, such as schools, were seen as key in this regard, both through their procurement and as educational arenas for healthy food and eating. The participants further envisioned societies characterized by good health, involvement, sharing, learning, meaning, joy, trust, pride, and faith in the future. In the future, the region was characterized by competent actors and entrepreneurial activities, including technologies, professionalism, and sales that would enhance sustainability, strong branding, and local economic viability.

The researcher also observed different weightings regarding the necessity for production to be organic, both during the workshop and the interviews, though this was not analyzed specifically. Some actors were "hard-core" organic defenders, whereas others expressed a more general approach to sustainable farming and believed that if it is local, it is more sustainable—the latter description, to a larger degree, characterized the participants from other sectors. However, the vision is coherent because the participants agreed on a general view regarding what characterizes sustainable development paths, such as diversity, circularity, and more localized food systems.

Perhaps the most crucial part of Fig. 4 is that it reveals the gaps between the current problematic and envisioned situations. The gaps indicate areas where idea generation could focus in the next workshops to identify actions and innovations for future plans and experiments.

#### 4. Discussion

This discussion is twofold and addresses crucial elements when establishing the agri-food living lab as a way of experimenting with new ways of co-creating knowledge and collaborating: how to select actors to involve within and beyond the agri-food domain and what characterize their problem understanding and shared vision, as well as its actionability. Integrating these, we also reflect on methodological issues.

##### 4.1. The selection of sectors and actors to include in the living lab

The decisions on which boundary, sectors, and actors to include affect both the process and outcome of an intervention (Midgley, 2000). Therefore, the introductory work of the establishment of the living lab had great emphasis on drawing the boundaries of the system and identifying who to invite to participate. Our main considerations for strengthening the organic vegetable agri-food systems in the Vestfold region included the following considerations:

*The first consideration* was to identify actors within the agri-food domain who wanted improvements in the current situation and who were motivated to participate in the living lab as a way to create changes (Lamine, 2018; Luederitz et al., 2017; Senge et al., 1999). These were mainly small-scale farmers and food entities, regional farmers' unions, and actors from public and knowledge institutions engaged in organic farming and consumption issues. One weakness is that actors from small, private agriculture and food entities had less time available to engage in the workshop, which might hamper the innovative capacity of the living lab. Nevertheless, these actors generally expressed an appreciation for the participatory approach and might participate more actively later – in the action planning or testing of ideas for improving the situation.

We also discovered change-oriented individuals within the

incumbent large-scale food supply organizations and invited them to join the initiative. However, our findings indicate that these individuals were disempowered from realizing changes in their organizations and were less motivated to participate (though a few participated in the workshop). This is one finding that supports our pre-assumption that the inclusion of change-resistant actors in large-scale food supply chains in the living lab would presumably hamper the process. This is supported in the literature and relates to the power biases on the more marginalized change-oriented niche actors (Avelino, 2017; Jackson, 2006; Kemmis and McTaggart, 2005; Ulrich, 2005). Exclusion of these powerful actors from being within the boundary could be considered a weakness of the study because if they were "convinced" of the need for radical changes, this could have substantially influenced the impact of the initiative, or at least changed the role perceptions and power relations (Turner et al., 2020). The opportunity to nurture alternative development paths in a "protective space" (Smith and Raven, 2012) was considered superior to risking a lack of trust and open-mindedness in the initial phase of the living lab by inviting change-resistant actors. We find support for this decision in the study by Fèche et al. (2021), who pose that confrontation with incumbent, conventional supporters regarding organic agriculture values was important for the progress of the initiative, although appreciating that such confrontation did not happen at the very beginning of the living lab initiative.

In this study, we did not consider an open invitation to consumers to the living lab because it could have resulted in a too large number of people. Rather, we assumed that the different civil society organizations, as well as the engaged actors in shops, catering, food initiatives, and tourism developers, would bring suitable consumer perspectives into the transition arena. This way, we expected these entities to cater to the need to bridge production and consumption (Darnhofer, 2014; Köhler et al., 2019; Meynard et al., 2017).

*The second consideration* regarding boundary involved the inclusion of sectors beyond the agri-food domain. We explored how different actors from other sectors could contribute to bypassing obstacles preventing the development of the organic vegetable niche, as a need exists to address the complexity and connect the fragmented and sectorial parts of our societies (Senge et al., 2005; Thompson et al., 2007). Fig. 5 shows a generalized version of the procedure described in Section 2.2 (Table 1) and applied in Section 3.1.2 (Table 3). With adjustments, the procedure is presumably applicable to development and innovation in other contexts where a desire exists to explore cross-sectorial collaborations. This procedure enabled the discovery of several sectors and actors that could participate in the living lab and collaborate for mutual progress – actors who found participation relevant when the researcher, during the conversational interview, explained the purpose of the initiative and reflected with the actors on potential mutual benefits. Through the snowball sampling method, the individual actors took part in reflections regarding potential sectors, actors, and participants, together with pre-knowledge from the literature and researcher's knowledge of the region and different sectors.

The actors who were ultimately included were involved with husbandry, waste management and recycling, education and competence development, welfare and work inclusion, and the business, regional, and tourism development sectors. They showed curiosity about the change initiative. The potential future collaborations could relate to the improvement of agronomic practices, development of new regional markets with direct contact between producers and the market, provision of healthy foods, and collaboration on logistics and other tasks. Thus, the study contributes insight into identification of sectors and actors within and beyond the agri-food domain who could collaborate in innovation in agri-food systems (El Bilali, 2019; Pigford et al., 2018).

The living lab consisted of a rich diversity of motivated and potentially collaborative participants and represented all types of actors in the quadruple helix (private, public, knowledge and civil society entities), which presumably is optimal for enabling future innovations (Steen and van Bueren, 2017). The initial effort made during the interviews seems

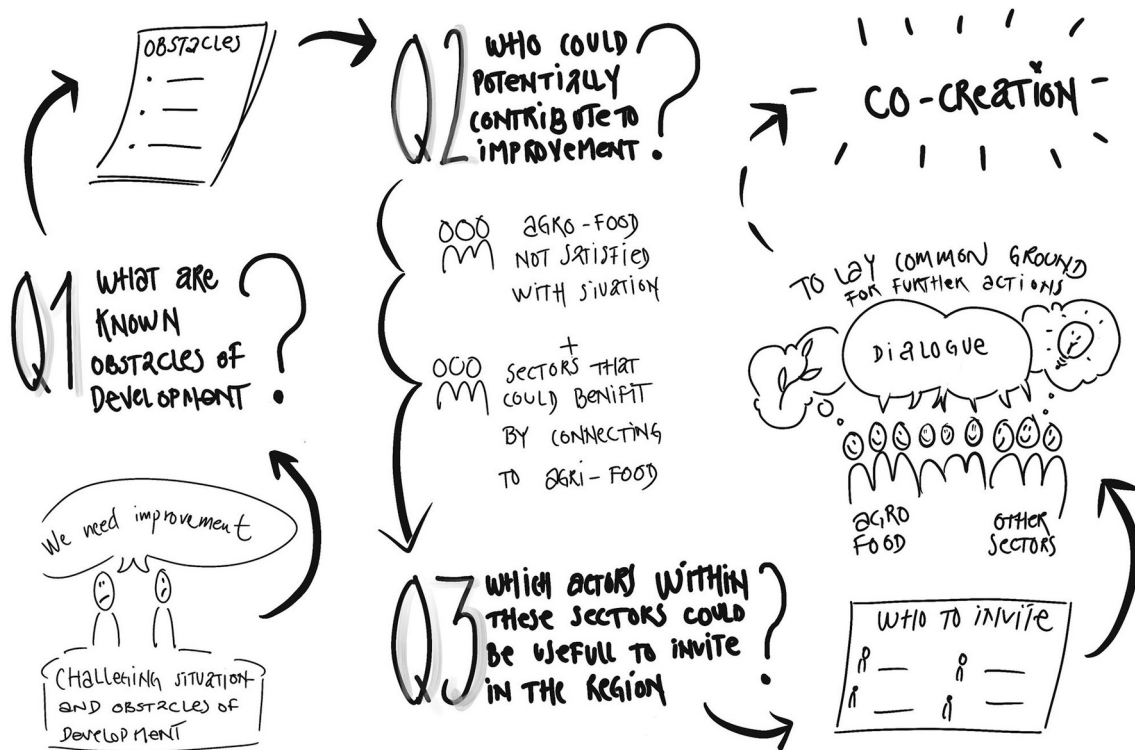


Fig. 5. Illustration of “Procedure for discovering potential cross-sectorial collaborations and actor selection” based on developing a specific niche in a place-based living lab.

to have had a positive influence on the engagement and recruitment of actors wanting to partake in the initiative, as emphasized in Greenwood and Levin (2006). The actors who were invited to the living lab were decided by the networks of those involved in the identification. No sectors were excluded, but some may have been left out due to limits in the creativity of the researcher and the other actors involved. The obstacles and potential sectors and actors identified at the introductory stage must not be petrified or a limiting factor as the participatory processes evolve and knowledge emerges, and more sectors and actors become relevant to include. Rather, the process could be considered as a way of thinking about how to operationalize cross-sectorial collaboration opportunities for niche development.

#### 4.2. The characteristics of the problem understanding and shared vision

The conceptualizations of the perceived problematic situation and the shared vision are the concrete output of the living lab activities, and they build on the insight and learning developed during the introductory work and the co-creative processes. The characteristics of the vision clearly show the need to think systemically and holistically and support the need for broad involvement to create sustainability transitions. The shared vision also encompasses an ontology of the future situation and richer perspectives than what (we can expect) is being reflected in goal formulations, as in the “national pilot county” project for production and consumption of organic vegetables led by the agricultural department at the County Governor’s office (Skjelvik et al., 2017). We acknowledge that this previous project laid a valuable foundation for the researcher-initiated living lab; however, the co-creation of deeper understanding and knowledge of the problematic situation and desired future support the claim that participatory processes and action research create added value and emergent properties (Bradbury, 2015; Greenwood and Levin, 2006; Ison, 2017; Jackson, 2006).

We interpret the shared vision as dealing with what the future agri-food systems will look like in terms of their physical structures and social

structures, such as how humans attain knowledge, interact, and which values will be present. The interlinks between natural and human societies are also visible in the vision, as ecology and societal functioning have become integral parts in the future situation (Rickerl and Francis, 2004). The more holistic aspects of agriculture and food emerged, such as the need for new closeness between different actors across production/consumption and organic/conventional agriculture through knowledge exchange and collaboration. Furthermore, the connections to quality of life, health, meaning, and pride were proposed in the vision. The actors in the periphery of the agri-food domain emphasized “local” and “sustainable” as much as “organic,” but in the actual context, this did not seem to interrupt the process of bringing the participants together in fruitful dialogues. We found that the producers had a desire to sell more locally, while at the same time shops, etc. found it difficult to get in direct contact with farms—a good starting point for planning collaborations. The vision suggests the need for a paradigm shift in how agri-food systems and societies function, including a shift from a competitive regime with a few powerful actors to more collaborative societies (Thompson et al., 2007). This radical thinking indicates trust among the participants to think openly and creatively about the future, rather than focusing on the constraints and difficulties of reaching the visions (Pool and Parker, 2017).

The generated understanding of the problem and shared vision was quite general, focusing on circularity, collaboration, competences, and other meta-concepts. This likely reflects the wide range of sectors and actors that participated. Nevertheless, the vision seems coherent in the direction of development and not internally contradictory, even though the actors placed differing emphasis on the notion of “organic” as the sustainable solution. Furthermore, it highlights gaps between the current and desired future situations; thus, we assume that actionable knowledge has been created (Luederitz et al., 2017). We do not know how the vision would have looked had we included actors within the agri-food domain with divergent views regarding what sustainable development entails. Involving these could have increased the difficulty

of developing a coherent vision to the point of incommensurability. The potential lack of trust among the participants was a further risk.

Using different methods and data sources – expert reports, conversational interviews, co-creative processes (together involving 59 people), participants' evaluations of workshop and researcher's reflections – reduces the potential for bias in the researchers' interpretations. Such biases are a risk also in action research, where the researcher is actively involved in the process itself (Levin, 2012). Furthermore, the drafted problem understanding and visions were presented in the second workshop for “approval” and adjustments.

Although the participants had ownership of the vision (Luederitz et al., 2017), a potential weakness emerges regarding the inclusion of a broad spectrum of societal sectors: These actors are less attached to the problematic situation of organic vegetables; therefore, they might have less ownership of the problem and commitment to the vision, and thus to the development of the niche, which is important for continued participation and collaborative action (Wittmayer and Schöpke, 2014). Therefore, the continued focus on their relevance is important for securing commitment (Senge et al., 1999). In this regard, and in general, follow-up activities are important for maintaining trust and momentum and for moving from talking to facilitating actions and changes in practice.

The change initiative had support from regional policy and in the form of additional financial resources to conduct the workshop, which is considered a crucial precondition for change initiatives (Luederitz et al., 2017). Still, the initiative was introduced by a university, which means that the intervention was a top-down initiative, and the future activities and outcomes will show whether the initiative managed to engage and connect to bottom-up initiatives in collective actions and innovations to be tested. An additional aspect regarding the continuation is that the potential of the change initiative might be overestimated (cf. alternative explanations according to Levin, 2012). The researcher was known to several participants prior to this project and had an engaged role in action research; hence participants might feel obliged to express excitement regarding the transition initiative to avoid disappoint the initiator (the researcher). If this is the case, a lack of engagement will be more visible during the follow-up workshops and activities.

## 5. Conclusion

The aim of this action research study was both to contribute to strengthening the position of organic vegetable food systems in the Vestfold region in Norway and to generate knowledge about how to initiate change processes. This was done by establishing a place-based agri-food living lab building on participatory and co-creative processes and taking the agroecological interpretation of sustainability as a prerequisite for bounding the initiative. The systems thinking and action research approach helped to address the complexity of the situation and aided in bridging production and consumption and identifying potential cross-sectorial collaborations.

Exploration of the potential cross-sectorial collaborations with mutual benefits is of particular relevance in the effort to operationalize the cross-cutting and multiple sustainable development goals of the UN. We developed a procedure to identify sectors and actors, both within and beyond the actual sector or domain in question, who could take part in change initiatives. By applying the procedure in our context, we discovered actors both within and beyond the agri-food domain who wanted to explore collaborative activities that addressed common challenges and investigate opportunities. The procedure can be adjusted and applied in other contexts, such as in developing other cases of place-based living lab initiatives with a specific challenging situation needing improvement. This could contribute to refining the procedure.

The study findings showed that even actors belonging to different sectors, roles, and backgrounds could co-create a common understanding of a challenging situation and offer a coherent shared vision. The gaps between the current and the future situations indicate areas where

idea generation could focus in the next workshops to identify actions and innovations for planning, testing, and experimentation. The initial phase of the living lab was the first step in building new networks, empowerment, and capacities for change in agri-food systems by involving more actors in the production of knowledge about actors, the problematic situations, and the holistic desired future situation. The findings indicate that action research initiatives and learning processes through living labs could contribute to empowerment for collective actions and emancipation of “marginalized groups,” such as small-scale organic farmers, specialized shops, and the like.

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## Declaration of Competing Interest

None.

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