

Norwegian University of Life Sciences  
Faculty of Biosciences  
Department of Plant Sciences

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# Participatory and collaborative approaches in sustainability transitions: Niche innovations in agri-food systems

Deltakende og samarbeidende arbeidsmåter i bærekraftsomstillinger: Nisje-innovasjoner i landbruks- og matsystemer

Christine Marie Hvitsand



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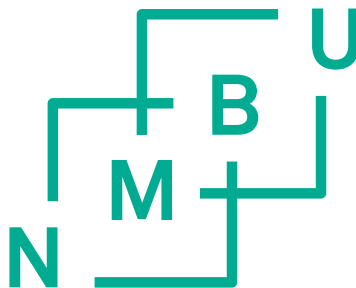
Deltakende og samarbeidende tilnærminger i bærekraftsomstillinger:  
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Philosophiae Doctor (PhD) Thesis

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# 1 Abbreviations and definitions

AFN:	Alternative Food Networks
AR:	Action research
CSA:	Community Supported Agriculture
GP:	Green Parallel
MLP:	Multi-Level Perspective
NAV:	Norwegian Labor and Welfare Administration
REKO:	REKO networks (Rettferdig konsum or fair consumption)
SDG:	Sustainable Development Goals
ULL:	Urban Living Labs

## 2 List of papers

- Paper 1 Hvitsand, C. (2016). Community Supported Agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers. *Agroecology and Sustainable Food Systems*, 40(4), 333-351.
- Paper 2 Gugerell, C., Sato, T., Hvitsand, C., Toriyama, D., Suzuki, N., and Penker, M. (2021). Know the farmer that feeds you: a cross-country analysis of spatial-relational proximities and the attractiveness of community supported agriculture. *Agriculture*, 11(10), 1006.
- Paper 3 Hvitsand, C., Raanaas, R. K., Gjøtterud, S., and Nicolaysen, A. M. (2022). 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. *Agricultural Systems*, 199, 103403.
- Paper 4 Hvitsand, C., Nicolaysen, A. M., Gjøtterud, S., and Raanaas, R. K. (XXXX). Forces and tensions influencing the viability of a co-created Alternative Food Network in Norway. *Manuscript in review process in journal.*

### 3 Abstract

Agri-food systems contribute to and face sustainability challenges across the entire value chain, from production, distribution, processing to retailing, consumption, and wastage. Organic farming, localized food systems, increased shares of plant-based food, and less wastage are measures that represent sustainable production and consumption directions. However, the transition toward sustainability is complicated by the background, beliefs, and values of the actors, as these lead to different goals and worldviews regarding what sustainable development entails. Conflicts of interests and fragmentation, and specialization of knowledge and decision-making all contribute to the messiness of the situation. The close interconnection of elements, such as actors, activities, institutions, and outcomes, in agri-food systems and beyond, suggests a need to consider systemic, multi-sectorial, multi-actor, and participatory and collaborative approaches to enhance sustainability transitions.

The objective of this thesis is to explore how participatory and collaborative niche approaches can be motivated and organized, and how they can contribute to sustainability transitions in the current agri-food system in different contexts. I explored two types of initiatives with participation and collaboration toward increased sustainability. The first is the local and alternative food networks of Community Supported Agriculture (CSA), which mainly involve individual consumers. I wanted to study the values, motivations, and proximity dimensions associated with engaging in CSA. In the second type of initiative, action research is applied in the facilitation and analysis of an innovation process framed as an “agri-food living lab,” which included piloting of a co-created alternative food network named Green Parallel.

Green Parallel consisted of professional buyers (contrasting the individual consumers in CSA). I wanted to contribute to improving the specific situation regarding organic agri-food systems by mobilizing participants to the initiative. Furthermore, I wanted to contribute knowledge about establishing a cross-sectorial change initiative and about tensions that may occur when niche innovations, which are entangled with existing purchasing structures of professional buyers, are piloted.

The thesis consists of four papers, where paper 1 and 2 concern CSA, and paper 3 and 4 concern the action research initiative and piloting of Green Parallel.

The research questions of the papers are:

Paper 1: Why do people engage in CSA?

How can CSA be a transformational act for producers and consumers toward food system changes?

Paper 2: How are spatial and relational proximity within and outside CSAs related to the attractiveness of CSAs in (peri-) urban contexts?

Paper 3: 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?

Paper 4: Which forces and tensions hinder or support the viability of a co-created alternative food network of organic vegetable producers and professional buyers?

Theoretical perspectives in systems thinking, multi-level perspectives, and participation and collaboration in niche innovations, action research, and living labs contributed to the design of the research and discussion of findings. Collection of data to answer the research questions were done using both quantitative and qualitative research designs, including action research.

Paper 1 is an exploration of the values, attitudes, and motivations of participants in CSA, conducted through interviews of producers and core group members during farm visits at five case farms, a survey of all consumers who were members of the (at that time) seven Norwegian CSAs, and a focus group interview at a national CSA network meeting. Producers and consumers in CSA were found to have distinct values and multiple motivations for participation. The CSA farms were small-scale



organic farms, and the involved farmers, growers, and core group members were opposed to the industrialized and globalized food system. The most important motivation among consumers was access to local and organic food. For producers and many of the consumers involved, the farms were an arena for converting societal values into practical actions. Farmers, growers, and members gathered around social and educational events, while participating in joint decision-making—activities that were organized by the farmers and members themselves.

Paper 2 concerns the significance of different proximity dimensions on the attractiveness of CSA farms. The study involved collecting data through a survey to farmers, managers, and consumers at two farms in each of three countries: Austria, Japan, and Norway. We analyzed our data using multiple regression and descriptive analysis. The perceived attractiveness was correlated with relational proximities of social, cognitive, institutional, and organizational dimensions. The CSA members were attracted to the CSA community, such as through direct contact with the farmer and participation in learning activities. They also supported the ideas of risk sharing and securing the farmers' income. This included interactions for building trust and exchange of knowledge and for sharing values and identity opposite to those of the dominant agri-food structures. The expected correlation with spatial (i.e., geographical) proximity was not significant, presumably because it had already been a self-selection process based on the distance and accessibility of the farm. Focusing on trust building, collaboration, and sharing of values and knowledge within and across organizations in the food system could increase the attractiveness of CSA.

Paper 3 concerns the establishment of a cross-sectorial and multi-actor agri-food living lab for conducting action research with the purpose of strengthening organic agri-food systems. As part of the introductory work and involvement of actors, a procedure was developed and applied to discover change-oriented actors within and beyond the agri-food domain. This was part of gaining preliminary insight into the situation and potential participants, mainly done through interviews. This process identified a range of potential participants and showed that they were motivated to participate by the prospect of meeting future collaborative partners. In one workshop, I facilitated participatory processes and the participants co-created a common problem understanding, entailing a rich and holistic understanding of the current problematic situation for development. Furthermore, they co-created a manifold but coherent shared vision. These processes laid the groundwork for the

identification of six emergent topics and gaps between the current and future situations and showed areas where we could make action plans.

Paper 4 concerns forces and tensions that influenced the viability of the alternative food network of Green Parallel as illuminated through reflections on observations in workshops, and between workshops by coordinator and researcher, as well as through interviews at the end of the piloting. Green Parallel was co-created in the agri-food living lab, motivated by a desire for collaboration for a logistical “solution” among producers, professional buyers, and a work inclusion and training entity. During the piloting, different tensions emerged, and the study identified five themes where tensions and contradictory forces occurred and affected the viability of Green Parallel. The forces work on several levels, ranging from within each individual and within the group to influences on the individuals by forces external to the niche innovation. Although the collective action of Green Parallel empowered the participants to act according to their desires, the occurring tensions made the collaboration and viability of Green Parallel challenging.

CSA entails self-mobilized participation and collaboration and represents a spearhead of agri-food systems transition. The agri-food living lab and Green Parallel entail interactive and supported participation, as the participation and collaboration were facilitated by the researcher. This research contributes to increased knowledge about how participatory and collaborative approaches that represent niche initiatives and innovations can be motivated and organized and how they could contribute to sustainability transitions by “unlocking” the currently entrenched agri-food situation. Both CSAs and Green Parallel create opportunities for new practices that can gradually enhance wider transition processes, and barriers and opportunities exist for niche innovations to develop and influence regime structures. This research contributes to theory regarding participatory and co-creative processes by 1) connecting action research and place-based living labs as approaches for facilitating change, 2) developing a methodology of establishment of cross-sectorial and multi-actor change initiatives, and 3) combining theories of multi-level perspective, field theory, and institutional economy to understand tensions at the individual level in change situations.

## 4 Norsk sammendrag

Matsystemene bidrar til, og er utsatt for, bærekraftsutfordringer i hele verdikjeden fra produksjon, distribusjon, prosessering, detaljhandel, forbruk og avfallhåndtering. Økologisk landbruk, mer lokale matsystemer, større andel plantebasert mat og mindre svinn er tiltak som representerer bærekraftige produksjons- og forbruksretninger. Omstilling for økt bærekraft er komplisert på grunn av ulikheter i mål og forståelse av hva bærekraftig utvikling innebærer og ulike «lock ins». Disse ulikhetene henger sammen med aktørens bakgrunn, antakelser og verdier. Interessekonflikter, fragmentering og spesialisering av kunnskap og beslutningstaking bidrar til at situasjonen er uoversiktlig. Den tette sammenvevingen av ulike elementer i og ut over matsystemet, som aktører, aktiviteter, institusjoner og virkninger, impliserer at bærekraftig omstilling krever systemiske, tverrsektorielle, multi-aktør, deltakende og samarbeidende tilnærminger.

Målet med avhandlingen er å utforske hvordan deltakende og samarbeidende arbeidsmåter kan motiveres, organiseres og bidra til bærekraftsomstillinger i ulike kontekster. Jeg studerte to typer initiativer basert på deltakelse og samarbeid for økt bærekraft: A) Andelslandbruk (Community Supported Agriculture, CSA), som er en modell for lokale matsystemer, ofte kalt alternative matnettverk (AFN). Disse involverer i hovedsak individuelle forbrukere. Jeg ønsket å studere verdier, motivasjoner og hva som tiltrekker aktører til det å engasjere seg i CSA. B) Aksjonsforskning for å tilrettelegge for og analysere en innovasjonsprosess innrammet som en "agri-food living lab" i Vestfold-regionen. Dette inkluderte pilotering av et samskapt AFN kalt Grønn Parallell, som besto av profesjonelle innkjøpere (i motsetning til individuelle forbrukere i andelslandbruk). Jeg ønsket å bidra til å styrke produksjon og omsetting av økologiske grønnsaker i den spesifikke konteksten ved å mobilisere deltakere til initiativet. Gjennom aksjonsforskningen ønsket jeg å framskaffe kunnskap om det å etablere et tverrsektorielt endringsinitiativ, og om spenninger som kan oppstå når innovasjoner som er viklet inn i eksisterende innkjøpsstrukturer til profesjonelle innkjøpere, blir testet ut.

Avhandlingen består av fire artikler, der artikkel 1 og 2 omhandler andelslandbruk og artikkel 3 og 4 omhandler aksjonsforskningsinitiativet og pilotering av Grønn Parallell.

Forskningsspørsmålene i artiklene er:

Artikkel 1: Hvorfor engasjerer folk seg i andelslandbruk?

Hvordan kan andelslandbruk være en transformativ handling for produsenter og forbrukere for endringer i matsystemet?

Artikkel 2: Hvordan er stedlig og relasjonell nærhet innenfor og utenfor andelslandbruk relatert til attraktiviteten til andelslandbruk i (peri-) urbane kontekster?

Artikkel 3: Hvordan identifisere og velge ut sektorer og aktører som kan involveres i å utvikle innovasjoner innen matsystemer for økologiske grønnsaker i den hensikt å fjerne hindringer og oppdage oversette muligheter?

Hva kjennetegner den opplevde forståelsen av dagens situasjon når det gjelder økologiske grønnsaker og en felles visjon for fremtiden i denne tverrsektorielle prosessen med ulike aktører?

Artikkel 4: Hvilke krefter og spenninger hindrer eller støtter levedyktigheten til et samskapt alternativt matnettverk med økologiske grønnsaksprodusenter og profesjonelle innkjøpere?

Teori knyttet til systemtenkning, «multi-level perspektiv», deltakelse, samarbeid og handlingsvalg, aksjonsforskning og «urban living labs» bidro til utforming av forskningen og i diskusjonen av funnene. Innsamling av data for å svare på forskningsspørsmålene ble gjort ved bruk av både kvantitative og kvalitative forskningsdesign, inkludert aksjonsforskning.

Artikkel 1 handler om å utforske verdier, holdninger og motivasjoner i andelslandbruk. Dette ble studert gjennom intervjuer av produsenter og kjernegruppemedlemmer ved besøk på fem case-gårdsbruk, en spørreundersøkelse

til forbrukerne som var medlemmer av de (den gang) syv norske andelslandbrukene og et fokusgruppeintervju på et nasjonalt nettverksmøte for andelslandbruk. Studien viser at produsenter og forbrukere i andelslandbruk har distinkte verdier og et mangfold av motivasjoner for å delta. De undersøkte andelsgårdene var småskala økologiske gårder der de involverte produsentene og kjernegruppemedlemmer var i opposisjon til det industrialiserte og globaliserte matsystemet. Den viktigste motivasjonen blant forbrukerne var å få tilgang til lokal og økologisk mat. For produsentene og mange av de involverte forbrukerne var gårdene dessuten en arena for å omsette samfunnsverdier til praktiske handlinger. Produsenter og medlemmer samlet seg om sosiale og pedagogiske arrangementer, samt felles beslutningstaking – aktiviteter som ble organisert av produsentene og medlemmene selv.

Artikkel 2 handler om betydningen av ulike relasjonelle og geografiske «nærhetsdimensjoner» på attraktiviteten til andelslandbruk. Dette ble studert gjennom en spørreundersøkelse til produsenter, ledere og forbrukere ved to gårder i hvert av landene Østerrike, Japan og Norge. Svarene ble analysert gjennom multippel regresjon og beskrivende analyse. Studien viser at den opplevde attraktiviteten var korrelert til sosiale, kognitive, institusjonelle og organisatoriske nærhetsdimensjoner (dvs. relasjonelle dimensjoner). Medlemmene i andelsgårdene ble tiltrukket av fellesskapet ved gårdene, inkludert det å ha direkte kontakt med bonden og ta del i læringsaktiviteter. De støttet også ideen om risikodeling og sikring av bondens inntekt. Den opplevde nærheten inkluderer samhandlingen som bygger tillit og fører til utveksling av kunnskap, og det å dele verdier og identitet som står i motsetning til de i de dominerende matmaktstrukturene. Den forventede korrelasjonen til stedlig (dvs. geografisk) nærhet var ikke signifikant, antakeligvis fordi det allerede hadde vært en egen seleksjonsprosess basert på den enkeltes avstand og tilgjengelighet til gården. På denne bakgrunn mener vi studien viser at fokus på tillitsbygging, samarbeid og deling av verdier og kunnskap innenfor og på tvers av organisasjoner i matsystemet kan øke attraktiviteten til andelslandbruk.

Artikkel 3 handler om etablering av en tverrsektoriell «living lab» med et mangfold av aktører. Laben ble etablert for å gjennomføre aksjonsforskning med det formål å få kunnskap om hvordan styrke, og bidra til faktisk styrking av, økologiske matsystemer. Som en del av det innledende arbeidet og involvering av aktører ble det utviklet og tatt i bruk en fremgangsmåte for å identifisere endringsorienterte aktører både innenfor og mer perifere til landbruks- og matsektoren. Dette ble gjort

å få en foreløpig innsikt i den nåværende situasjonen og potensielle deltakere, og ble hovedsakelig gjort gjennom intervjuer. Denne innledende prosessen gjorde det mulig å identifisere en rekke potensielle deltakere og viste at de var motivert til å delta gitt utsiktene til å møte fremtidige samarbeidspartnere. Jeg fasiliterte deltakende prosesser i en workshop der deltakerne samskapte en felles problemforståelse som viste en rik og helhetlig forståelse for situasjonen når det gjelder det å styrke produksjon og forbruk av økologiske grønnsaker. Videre skapte de en mangfoldig, men enhetlig felles visjon. Prosessene gjorde oss i stand til å identifisere og beskrive seks temaområder og gap mellom nåværende og fremtidig ønsket situasjon. Disse temaene og gapene viste hvilke områder det var aktuelt å utvikle idéer og utarbeide handlingsplaner innenfor.

Artikkel 4 handler om krefter og spenninger som påvirket levedyktigheten til det alternative matnettverket Grønn Parallell, som ble pilotert i to sesonger. Dette ble undersøkt gjennom at koordinator og forsker gjorde refleksjoner rundt hva som ble observert under og mellom workshoper, samt at det ble gjennomført intervjuer ved slutten av piloteringen. Grønn Parallell ble samskapt i en living lab, motivert av et ønske blant produsenter, profesjonelle kjøpere og en arbeids- og inkluderingsbedrift om å samarbeide for en logistikk-"løsning". I løpet av piloteringen gjorde ulike spenninger seg gjeldende, og vi identifiserte fem temaer der spenninger og motstridende krefter oppsto og påvirket levedyktigheten til Grønn Parallell. De motstridende kreftene gjorde seg gjeldende på flere nivåer, fra innad i hver enkelt person og innad i gruppen til at individene ble påvirket av krefter utenfor gruppen. Selv om den kollektive rammen rundt Grønn Parallell la til rette for at deltakerne kunne samarbeide i henhold til deres eget ønske, gjorde spenningene at samarbeidet og levedyktigheten til Grønn Parallell ble utfordrende.

Andelslandbruk innebærer en form for selvmobilisert deltakelse og samarbeid, og representerer en spydspiss i omstillingen til økt bærekraft i matsystemene. Living lab'en og Grønn Parallell innebar derimot såkalt interaktiv og støttet deltakelse, fordi deltakelse og samarbeid ble tilrettelagt av forsker. Denne avhandlingen bidrar til økt kunnskap om hvordan deltakende og samarbeidende arbeidsformer, hvilket representerer initiativer og innovasjoner som er alternativer til det dominerende, kan motiveres og organiseres, og hvordan slike initiativer kan bidra til bærekraftsomstillinger ved å «låse opp» den fastlåste situasjonen i det nåværende matsystemet. Andelslandbruk og Grønn Parallell representerer muligheter for ny praksis som gradvis kan styrke bredere omstillingsprosesser, men det er både

barrierer og muligheter for at bærekraftsinnovasjoner kan endre de eksisterende strukturene. Avhandlingen bidrar til teoretisk og metodologisk utvikling når det gjelder deltakende og samskapende prosesser gjennom 1) koblingen av aksjonsforskning og stedsbaserte living labs for å fasilitere endringsprosesser, 2) å utvikle en fremgangsmåte for etablering av tverrsektorielle endringsinitiativer med ulike aktørtyper, og 3) bruk av «field theory» og institusjonell økonomi for å forstå deltakernes handlinger og de spenninger som kan oppstå i endringssituasjoner sett i et multi-level perspektiv.

# 5 Synopsis

## 5.1 Introduction

### 5.1.1 The societal challenge and research gap

Fundamental changes are needed in our society related to energy, mobility, water, food, and the general production and consumption patterns to reduce climate change, pollution, overuse of natural resources, and loss of biodiversity (UN, 2022). Agri-food systems consist of “elements,” such as various actors, activities, institutions, and outcomes related to production, processing, distribution, retailing, consumption, wastage, and recycling, and each element has sustainability challenges (Ericksen, 2008; McIntyre et al., 2009). Although these elements in agri-food systems and beyond are closely interconnected, knowledge and decision-making are specialized and fragmented (IPES-food, 2016). Conflicts of interests and goals are apparent and are, among others, related to the tension between short-term economic gains and long-term caretaking of the environment and natural resources. In addition, different and subjective perceptions abound regarding what sustainable development entails, depending on the background, worldviews, beliefs, and values of the actors (Bawden, 2012; Rigby & Cáceres, 2001; Thompson et al., 2007). These complex and uncertain situations are what we call “messy situations” (Ackoff, 1974; Armson, 2011) or “wicked problems” (Rittel & Webber, 1973), suggesting that no simple solutions are available to apply.

Governments acknowledge the need for sustainable development in agri-food systems. The United Nations (UN) has decided on 17 Sustainable Development Goals (SDGs), focusing on economic, social, and environmental sustainability (United Nations, 2022). Agriculture, food, health, and rural livelihood are integrated into most of these goals, being the subject of specific food systems programs and summits. Policy is articulating a need to take systemic, whole supply chain and multi-actor collaborative approaches to transitions in agri-food systems, e.g., seen in the European Environmental Agency (European Environmental Agency, 2017) and the Farm to Fork Strategy (European Commission, 2020). Participation and collaboration are means for achieving sustainable development paths by increasing capacity (cf. SDG no. 17; UN, 2022). Lately, a responsibility of research and innovations to contribute to solving pressing societal problems, such as



sustainability, has been further elaborated through the EU's "missions" for research and innovation (Mazzucato, 2018), which also can include agricultural innovations (Klerkx & Begemann, 2020).

There is abundant knowledge about what characterizes sustainable agri-food systems. The International Panel of Experts on Sustainable Food Systems (IPES-food) outlines the need for a paradigm shift from specialized industrial agriculture to diversified agroecological systems with sustainable production methods, such as organic production, and short food supply chains (IPES-food, 2016). The aims of organic farming are to enhance soil, plant, animal, and human health through the absence of chemical pesticides and mineral fertilizers, to sustain natural environments, and to secure fair incomes for farmers (IFOAM Organics International, 2019). The establishment of short food-supply chains, mainly entailing more localized food systems, are assumed to represent a sustainable development path (Forssell & Lankoski, 2015; Lyson & Green, 1999). In addition to these aspects, the adoption of more plant-based diets and reduction in food wastage would enhance sustainability (Muller et al., 2017).

Despite knowledge about what characterizes sustainable agri-food systems, several mechanisms are locking in the current situations, and this is preventing changes (IPES-food, 2016). The concentration of economic power and interests in industrial agriculture and global trade, with their political influence, reinforce the different types of lock-ins. Instead of a continued top-down policy in which research and technological development do not favor sustainability, a need exists to shift the gravity in the agri-food systems to empower agents of change and to create alliances for change. However, reasoning about and acting upon alternatives can be prevented by rules, norms, and routinized and habituated behavior (Vatn, 2015).

Regarding change processes in agriculture, the wider food system and beyond, a need arises to focus on the change itself and how change comes about by also including subjective elements (i.e., our assumptions, beliefs, values, identities, and emotions) (O'Brien, 2013), to move from talking to acting (Pfeffer & Sutton, 2000). Research could contribute to creating knowledge regarding how to accelerate changes based on scientific and practical knowledge about what is sustainable, desirable, and feasible in situations with complexity, uncertainty, and conflicts of interests (Köhler et al., 2019; McIntyre et al., 2009). Knowledge is needed on how to convert the interlinked and sometimes contradictory UN Sustainability

Development Goals into concrete actions locally, emphasizing the need for new collaborative and transdisciplinary research approaches involving societal actors, and integrating the normative dimensions of the goals (Schneider et al., 2019). Addressing messy and locked-in situations by applying holistic approaches that cover the production-consumption lines, and multiple actors and sectors is regarded as purposeful (Darnhofer et al., 2012; El Bilali, 2019; Hebinck et al., 2021; IPES-food, 2016; Köhler et al., 2019; Meynard et al., 2017). Participatory and collaborative approaches, including those of action research, could contribute valuable knowledge and actions that could lead to an “unlocking” of the unsustainable situation in agri-food systems (IPES-food, 2016; Thompson et al., 2007).

*Sustainability transitions* entail long-term processes of radical and structural changes in sectors or in places at the level of societal systems and are needed to address the many environmental problems (Köhler et al., 2019). Several collaborations and practices that represent increased sustainability exist within agriculture and food consumption. These often occur in the form of bottom-up initiatives and niche innovations based on local needs, resources, and contexts and can, for instance, be alternative food networks (AFN) (Lamine et al., 2012; Seyfang & Smith, 2007). These collaborations are often characterized by a common set of values, trustful relationships, and a desire to take part in alternatives to the mainstream ways of producing and consuming. The collaborations can take form as collective action in social movements within civil society and as active citizens’ involvement at the local scale.

Most AFNs involve individual consumers, but collaborations can also involve professional buyers, as described, for example, by Bui et al. (2016). Collaborations are more complex when they involve professional buyers, such as public and private canteens, restaurants, and different types of stores, than those with a direct producer–consumer relationship, as they entangle pervasive societal structures. For this reason, studies of AFNs that involve professional buyers could add valuable insight into how occurring tensions act as hindering or supportive forces of a proposed change, and how professional buyers could contribute to sustainability by engaging in collective action. Participation of broader parts of societal actors could trigger wider processes of change in agri-food systems. For example, increasing purchases of organic foods by public entities has been shown to stimulate local organic production (Bui et al., 2016; Lindström et al., 2020).

In some situations, various challenges prevent collaborations and change initiatives from taking place on their own, and in those cases, transition intermediaries can catalyze processes and sustainability transitions by creating new collaborations within and beyond niche activities, thereby disrupting dominant configurations (Kivimaa et al., 2019). Researchers could accelerate participation and collaboration for sustainable development through action research (Köhler et al., 2019; Wittmayer & Schöpke, 2014; Zuber-Skerritt, 2012), and this prospect has led to a view of action research as “a major frontier for methodological advancement” in sustainability transition research (Köhler et al., 2019, p. 20). According to Herr and Anderson (2015, p. 4), “action research takes place in settings that reflect a society characterized by conflicting values and an unequal distribution of resources and power.” The involvement of different societal actors who are aware of the need for change brings together different kinds of knowledge and could engage and empower collective learning, action, and innovations for societal changes while entailing a systems approach to changes (Bawden, 2012; IPES-food, 2016; Jackson, 2006).

The involvement of citizens in action research enables the integration of community perspectives on social and environmental problems into mutual knowledge development regarding sustainable development (Egmore, 2016). Action research has been shown to stimulate collaboration and changes in agri-food systems (see, for example, Cuéllar-Padilla & Calle-Collado, 2011; Guzmán et al., 2013). The focus of action research is often on the production and farm levels; therefore, it could open up new insights to involve a broader spectrum of societal sectors and actors, with the aim of strengthening the sustainability of agri-food systems. The integration of agri-food systems and other topics and activities at a local level has potential (Lamine et al., 2012), and different types of actors can play different roles in transitions (Köhler et al., 2019), including those in the value chain.

Broad participation and collaborations are less likely to self-organize and need coordination and facilitation to materialize (Cuéllar-Padilla & Calle-Collado, 2011), including the establishment of governance structures and coordination of local experiences and innovations (Lamine et al., 2012). These structures could include ones that enable the connection of top-down processes of policy for sustainable development and bottom-up processes of engaged individuals (citizens, employees, firms, etc.) through co-creative processes, such as in place-based living labs (Hvitsand & Richards, 2017). However, knowledge is needed regarding how to

establish and facilitate arenas in which a diversity of actors can participate and co-create ideas and actions for collaborative activities for agri-food sustainability.

A crucial part of understanding the emergence of alternative production and consumption is understanding the motivations, values, collective learning, and changes in everyday practices, as well as tensions occurring at different levels, conditions for successful collaborations, and the ability or inability to influence the mainstream situation (see, for example, Schein, 1996; Schneider et al., 2019; Seyfang and Smith, 2007). Participation in interactions with other actors can strengthen commitment, as shown by De Bernardi et al. (2020) regarding AFN. Participation and learning in AFN might indirectly be significant for sustainability, as active involvement can increase awareness, reinforce values, and affect consumers' choices about preferred production methods and supply chains (Forssell & Lankoski, 2015). However, moving toward collective thinking and a "we" intention, which is necessary for collective action, might be challenging due to present-day societies' individualistic and competitive thinking (Vatn, 2015). Studying local initiatives, including through experiments and action research, can contribute to an increased understanding of how participation, collaboration, and transition can take place at the local level (Klerkx et al., 2010; Köhler et al., 2019; Schot & Geels, 2008; Seyfang & Smith, 2007), and of the capacity and capability (i.e., agency) of individual actors to change behavior (Huttunen et al., 2021).

This thesis explores two types of initiatives where participation and collaboration towards increased sustainability are core: The first is the local and alternative food networks of Community Supported Agriculture (CSA), which mainly involve individual consumers; this is explored through a national study and a cross-national study. The second is an "agri-food living lab", in which action research is applied in the facilitation and analysis of an innovation process. The living lab included change-oriented actors within and beyond the agri-food domain, and the participants co-created and collaborated in a local alternative food network named *Green Parallel*. This network involved professional buyers and was piloted and studied for two seasons.

### **5.1.2 Objectives and research questions**

The focus of the study was on organic vegetables and more localized food systems, with the assumption that this represents a direction in production and consumption that can enhance sustainability transitions (see section 5.2.1.). The objective of this thesis was to explore how participatory and collaborative niche approaches can be motivated and organized and how they can contribute to sustainability transitions in the current agri-food system in different contexts. Following this, I wanted to a) study the values, motivations, and proximity dimensions associated with engaging in Community Supported Agriculture (CSA) and b) facilitate a change and innovation process to gain knowledge about establishing a cross-sectorial change initiative as well as studying tensions at different levels that occur when niche innovations are piloted. For b), another objective was to contribute to improving the specific local situation.

CSA is an already existing niche innovation characterized by sustainable production methods, mainly organic, and a high degree of participation and collaboration that research and other initiatives could learn from. The action research, by contrast, consisted of a participatory and co-creative change and innovation process with broad actor engagement and the potential to lead to collective knowledge development and actions among the participants. The latter was an open innovation process in which the innovation outputs and concrete actions were not given in advance.

The research approach I applied includes both research on actors (in a) and an engaged, action-oriented way of doing research with the actors as research participants (in b) (Herr and Anderson (2015), to provide manifold insight into both initiatives. I took a critical research approach, in the sense that it criticizes existing structures and power relations, and investigated on what grounds participatory and collaborative niche innovations emerge and are managed, with or without the intervention of a facilitating researcher.

The thesis describes and discusses four papers, which contribute to fill in the research gaps individually and together. The papers contribute to the main objective in different ways in terms of their focus and methodologies, with the objectives and research questions as shown in Table 1. The aim is to show how and why the papers connect, as well as what can be learned beyond the individual papers.

*Table 1: Objective of thesis and papers, research questions, and research paradigm*

Thesis	Paper	Objectives	Research questions	Research paradigm
<p>Objective:</p> <p>Explore how participatory and collaborative niche approaches can be motivated, organized, and contribute to sustainability transitions in the current agri-food systems</p>	Paper 1	To contribute to a better understanding of the transformational potential of CSA by exploring values, attitudes and motivations among producers and consumers involved	<p>Why do people engage in CSA?</p> <p>How can CSA be a transformational act for producers and consumers toward food system changes?</p>	Research on
	Paper 2	To better understand the relevance of different proximity dimensions for the attractiveness of the CSA model	How are spatial and relational proximity within and outside CSAs related to the attractiveness of CSAs in (peri-) urban contexts?	Research on
	Paper 3	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, and to generate more knowledge regarding the	<p>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?</p> <p>What characterizes the perceived understanding of the current situation regarding organic vegetables and the</p>	Research with

	Paper 4	<p>establishment phase of this type of change initiative</p> <p>To contribute to the realization of more localized food systems for organic vegetables in the Westfold region, and through this process, to obtain more knowledge regarding the occurring forces and tensions that can support or hinder niche innovations to develop and sustain</p>	<p>shared vision for the future in this cross-sectorial and multi-actor process?</p> <p>Which forces and tensions hinder or support the viability of a co-created alternative food network of organic vegetable producers and professional buyers?</p>	Research <i>with</i>
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### **5.1.3 My background and research interests**

My personal, educational, and professional background has formed who I am and how I think. I have been engaged in environmental, animal, and social inclusion concerns most of my life and have, in different ways, engaged in these topics through both paid and volunteer work, as well as in how I live my personal life. This includes being oriented toward buying plant-based, organic, and local food from alternative sales channels, such as CSA and REKO networks.

My education in Economics and Resource Management at the Norwegian University of Life Sciences enabled me to theoretically consider the connection between economic interests and the influence of these on nature, animals, and natural resources. When employed at Friends of the Earth Norway, I formulated information material based on research, lobbied national and local politicians, and supported the organization's local teams to enhance more environmentally sound agriculture and waste management, including the reduction of waste. Later, I was employed as a project leader at the intermunicipal waste management entity in the region where I live. In this position, I had the freedom to implement extensive waste sorting schemes in four municipalities, and I was responsible for citizen contact. I also had the responsibility of contacting local farmers who could potentially be interested in organic fertilizers from recycled sludge, as well as formulating tenders on behalf of the entity.

At Telemark Research Institute, where I have been working as a researcher since 2007, I have conducted research and development projects covering different topics, such as environmental policy instruments in agriculture, organic farming, alternative food networks, circular economy, work and social inclusion, public health, regional development, and platforms for co-creation and innovation (Urban Living Labs, among others). Several of these projects have had cross-sectorial and/or action-oriented approaches, and several have taken place in the Vestfold region where my (PhD) action research also took place.

By creating projects and applying for funds from the Norwegian Agricultural Agency, I had the opportunity to contribute to research about the emergence of AFN in Norway through the first nationwide studies of CSAs (Hvitsand, 2014) and REKO networks (Leikvoll et al., 2020). Data from both studies were used in scientific articles about CSA in Hvitsand (2016) (paper 1) and about REKO in Hvitsand and



Leikvoll (2023). During the NEST conference (the network of early career researchers in sustainability transitions) in Lisbon in 2019, I was invited to participate in a cross-national research and writing project because of my previous research on CSA. This fitted well into the focus of my PhD research, and the opportunity for international collaboration resulted in paper 2.

Research on processes of co-creation and innovation in relation to sustainable urban and rural development is another topic that has impacted my thinking. The research on Urban Living Labs and the experience from collaborating with and following municipalities and local initiatives (Hvitsand & Brandtzæg, 2019; Hvitsand & Richards, 2017) are actively utilized in the action research part of my PhD research.

By working in different entities with distinctive societal roles, as well as with different topics, I increasingly realized the interconnections between diverse subjects and sectors, and that challenges and opportunities could be seen in relation to each other. This impacted the chosen bounding and design of the action research (paper 3). The encounter with systems thinking gave my own thinking about fragmentation and potential connection and output of collaborating a theoretical anchoring.

I am comfortable with conducting both quantitative and qualitative research, and I choose the research methods that are best suited to answer the research questions in each case. However, I have increasingly turned toward approaches with a more engaged researcher role, starting with Hvitsand & Kleppe (2010) connecting three intermunicipal waste management entities with farmers, farmers' unions, and agricultural extension service at the local level. I would like my research to contribute to actual change in society, in addition to analyze changes with a more observing researcher role. Thus, applying for the PhD position at NMBU naturally fell into my research interests both regarding the topic and the methodological approach.

## 5.2 Sustainability in agri-food systems

This thesis is about the development toward a more sustainable agri-food system, and I find a need to elaborate on what I define as an *improvement* in agriculture and food consumption. Furthermore, I briefly describe the Norwegian context regarding agri-food initiatives for increased sustainability.

### 5.2.1 Worldviews and sustainable niches in agri-food systems

Different understandings of the concept of sustainable development and the goal of agriculture exist, and these can be related to different worldviews. We can separate into two main worldviews or paradigms: the “specialized industrial agriculture” and the “diversified agroecological systems” (IPES-food, 2016) (see also Lamine et al. (2012) and Thompson et al. (2007)). The first is associated with a worldview appreciating productivity and quantity, use of chemical inputs, technological innovations (e.g., mechanical, bio-, and gene technology), specialization and global trade, the production of large volumes, and standardization of products, and it typically entails long food supply chains and highly processed food. Sustainable development in this worldview consists of incremental steps, such as insect warning technology allowing for less use of pesticides.

The second worldview represents a shift from the first worldview to diversified agroecological systems and a holistic view of agriculture, food supply chains, healthy and varied diets with less processed food, cultural preferences and taste, knowledge development and innovations responding to local needs, and participation to secure resilient agri-food systems that remain productive (IPES-food, 2016). This type of system favors organic and localized food systems with short food supply chains. Furthermore, and connected to the second worldview, Zuber-Skerritt (2012) highlights that movement toward environmental, social, and economic sustainability requires a worldview that appreciates collaboration and contributions to a common goal rather than a pursuit of individual independence and goals.

Relating the second and alternative worldview to the field of sustainability transitions, the concepts of *organic farming*, *alternative food networks (AFN)*, and *agroecology* are regarded as niches that are more sustainable than conventional ways of producing and distributing food (i.e., first worldview) (El Bilali, 2019; Smith, 2006). In the following, I explain each of these niches and the assumed contribution to sustainability, though they are largely overlapping. Niches, as a theoretical concept, will be treated in section 5.3.2.

*Organic farming* is ideologically rooted in principles of ecology and sustainability regarding environmental, economic, and social perspectives (FAO, 2002; IFOAM Organics International, 2019). Certified organic farming is subject to production regulations, such as avoiding mineral fertilizers, chemical herbicides, and pesticides. The International Federation of Organic Agriculture Movements (IFOAM), an international membership-based organization promoting organic farming, describes four principles of organic farming: a) promoting health for soils, plants, animals, and humans; b) ecology and the emulating and sustaining of natural systems; c) fairness, equity, and respect for all living things; and d) care for the generations to come. Based on this, organic farming constitutes a niche or movement that represents a desired development path in agricultural production and food consumption that articulates an opposition to the industrialized and unsustainable agriculture and food situation (Smith, 2006; Storstad & Bjørkhaug, 2003). However, organic food is debated for the long-distance travel of organic products (Rigby & Cáceres, 2001) and “being in a co-evolutionary dance with the dominant agri-food system” (Darnhofer, 2014, p. 439). An illustrative example is that organic products sold through the long supply chain meet the same requirements as conventional products regarding the volumes and uniformity of products and are competing against imported products on price.

Still, on a general and aggregated basis, expansions in organic farming are assumed to constitute a desired sustainable development path in agriculture and food consumption. Nevertheless, the focus is on whole supply chain aspects of organic food (Darnhofer, 2014). Organic farming, in combination with reductions in food wastage, reduced production and consumption of animal products, and increased production and consumption of legumes, are postulated to lead to more sustainable agri-food systems and sufficient food for the world (Muller et al., 2017).

*Alternative food networks (AFNs)* or local food systems can be understood as arrangements “being rooted in particular places, aim to be economically viable for farmers and consumers, use ecologically sound production and distribution practices, and enhance social equity and democracy for all members of the community” (Feenstra, 1997, p. 28). AFNs are characterized by more direct producer–consumer relationships with shorter supply chains and are thus considered by the actors to represent a contrast to the conventional food chains, bringing forth food with different and desired qualities (Tregear, 2011). AFNs

generally relate to a re-attachment of food production and consumption to place and to community development (Renting et al., 2003) and are also regarded as social movements (Lamine et al., 2012). Moving toward more localized food systems and eating seasonally produce are considered more sustainable due to less emissions from transportation, for instance, and to a distribution of power over decisions regarding what is produced and how and where it is produced (Lyson & Green, 1999; Renting et al., 2003).

Examples of AFNs are farmer's markets, Community Supported Agriculture (CSA), REKO (fair consumption) networks, farm shops, food cooperatives, and direct selling to restaurants. AFNs create opportunities for small- and medium-scale producers that are not able to or do not desire to sell through long supply chains (Lefèvre et al., 2020; Milford et al., 2021). Short food supply chains generally do not have the same requirements as those present in long supply chains, such as for uniformity, large volumes, and low prices. This suggests that more of the production can be sold as human food.

Consumers in AFN are concerned about the problems of industrialization and globalization and have preferences for organic and local food (Hashem et al., 2018). However, AFN and local food initiatives receive critique for a conflation of the spatial and scalar characteristics with expected outcomes, such as ecological sustainability (e.g., organic production and social and economic justice and benefits among farmers, consumers, or the community, or healthy, safe, and quality food) (Born & Purcell, 2006; Tregear, 2011). Tregear (2011) contests AFN studies that claim that participants exhibit values and motivations radically different from those associated with the mainstream food system, but instead claim that values and motivations are diverse. For instance, increased sustainability is not always the motivation behind purchasing through AFN, as it could also be motivated by a desire to support local farms and businesses and could entail farms with conventional forms of production methods (Winter, 2003). Thus, more studies are needed that inquire into the values, motivations, and agendas of those involved in AFN while utilizing different theoretical perspectives (Born & Purcell, 2006; Tregear, 2011; Winter, 2003).

*Agroecology* is defined in Gliessman (2014, p. 345) as “the science of applying ecological concepts and principles to the design and management of sustainable food systems,” though several definitions of agroecology exist. It entails sustainable

production methods, such as organic production, diversified and locally adapted species varieties, is often more labor-intensive and utilize less external input, involve recycling of nutrients, and more localized food systems. Furthermore, agroecology is regarded as a movement for a redesign of the agri-food system in the sense of being a critique of the current regime, and a transformational agroecology is “committed to a more just and sustainable future by re-shaping power relations from farm to table” (Méndez et al., 2013, p. 12).

Agroecology calls for participation and collaboration, also in research. Action research enables the involvement of different actors in learning and action, including those voices that are usually not heard in research processes (Bawden, 2012; Méndez et al., 2013). These approaches are used at the community level and can contribute to more organic farming as well as the development of local food systems, as illustrated by the cases in Guzmán et al. (2013).

Organic farming, AFN, and agroecology are largely overlapping niches in community-based initiatives, such as in cases of producing diverse organic food that is distributed locally through short food supply chains (e.g., in Community Supported Agriculture; Levidow et al., 2014). The production is usually organic (or close to organic), and organizing differs radically from mainstream ways of producing, communicating, consuming, and trading.

The logic (at least in the original CSAs) is situated in a moral or social economy rather than a market economy (Galt, 2013; Seyfang & Smith, 2007) in the sense that it has different ethical values and economic organization: CSA consists of a direct communication and distribution of goods, usually vegetables, between producers and consumers, usually private households. The products are paid for in advance and before the season starts, which creates predictability for the farmer (Galt, 2013; Henderson & Van En, 2007). This means that the farmer and consumers (i.e., members) share the risks and benefits of variations in yields. Members are also commonly involved in farm activities as part of the exchange for goods. Often, the members participate in decisions about what is to be produced and which educational and social activities and economic dispositions are to take place. The latter are especially prominent in consumer-driven CSAs. Still, CSA faces some challenges, especially well researched in North America.

From the consumer side, for instance, different barriers, such as household income, could prevent people from joining CSA (Henderson & Van En, 2007). From the

farmers' side, a risk emerges for self-exploitation due to undervaluing their own extensive work and sense of personal obligation (Galt, 2013). Furthermore, CSAs in the American West experience competition for customers, turnover of members, and a large workload related to recruitment activities (Galt et al., 2019). This suggests that areas of concern remain to be investigated regarding CSA as a spearhead for sustainable agri-food systems. Of interest in this regard is insight into motivations, values, and what attracts and makes customers commit to a "collective project," such as an AFN, even though it requires time and effort to engage and change everyday practices.

Contrary to the standardized and "placeless" products and production, the alternative products and production are termed in the literature as having a community, place, spatial, territorial, or geographical embeddedness (e.g., Lamine et al., 2012; Renting et al., 2003) and having a proximity of production and consumption to place. Furthermore, short food supply chains emerge and are sustained through a relational proximity (i.e., the participants experience, though to varying degrees, attachment, and a motivation to join based on common beliefs, values, worldviews, trust, expectations, knowledge sharing and reciprocity) (Dubois, 2018; Seyfang & Smith, 2007; Tregear, 2011). Innovations for sustainable development based in the local situation and motivated by an awareness of social needs and ideological commitment can emerge as bottom-up initiatives (Seyfang & Smith, 2007).

Short food supply chains and AFNs involving professional buyers of regime entities are similar to what is termed *hybrid* initiatives (Lamine et al., 2012). Hybrid initiatives consist of an indirect contact with individual consumers compared to CSA, which usually involves direct producer–consumer contacts. Short and alternative food supply chains allow for other quality criteria among professional buyers, such as those regarding shape, and could involve buyers in a collective planning of what to grow. Paper 1 and paper 2 about CSAs concern producer–consumer collaborations, while paper 4 about Green Parallel concerns producer–professional buyer collaborations (i.e., entities purchasing for selling or serving to individual consumers). A potential is evident for stimulating sustainable agri-food systems by involving larger parts of purchasers than the individual ones. Increased purchases of organic food, such as by public entities, can stimulate local organic production (Bui et al., 2016; Lindström et al., 2020). In this regard, obtaining more

knowledge about what motivates and stimulates collaborations between producers and professional buyers becomes important.

### **5.2.2 The Norwegian context**

Norway has a farm structure of small-scale and scattered farms, and a political goal is to maintain this structure to secure rural livelihood and development. At the same time, a further goal is to have efficient food production, as well as stable production and food security—goals that are difficult to reach at the same time (Vik, 2020). Large-scale producer-owned cooperatives buy, process, distribute and/or sell goods to the retail chains on behalf of the members (Bratberg, 2022; Veidal, 2011). In addition, some of the cooperatives function as interest organizations and market regulators regarding prices and volumes and are also engaged in advisory and quality criteria work. The cooperatives exist within the different product categories and have made farmers less vulnerable by securing their deliveries if they meet the requirements for uniformity and volumes of products (Milford et al., 2021; Veidal, 2011). In this regard, Veidal (2011) found dissatisfaction among entrepreneurial-oriented farmers regarding how the cooperatives had developed, as the requirement for uniformity made the producers and products invisible and removed their uniqueness. The two main cooperatives within fruit, berries, and vegetables annually make agreements about the quantities of conventional and organic production with the two main Norwegian wholesalers (Milford et al., 2016). However, fruits, berries, and vegetables are, to a large degree, in greater competition with imported food than other food items, and their delivery security is less than that for products to other cooperatives.

In Norway, certification of organic production methods and fulfilment of the regulations is controlled by Debio (see Norwegian Food Safety Authority (2022)). Organic farmers receive additional production subsidies based on the production area, and funds for knowledge development and innovation activities to enhance organic farming can be granted after application. Still, the shares of organically grown and consumed vegetables in Norway are small, with the production area of organic vegetables, including potatoes and fruits, accounting for 2.6 % of the total area of these products, and the sales account for 4.2 % of total sales of vegetables, including imported goods (Norwegian Agricultural Agency, 2019a).

According to the *National strategy for organic agriculture*, the goal is to increase the production and consumption of organic products (Ministry of Agriculture and Food,

2018). Moreover, as much of the demand for organic food as possible is to be covered by domestic production, and the potential for increased production is considered largest for vegetables, grain, and fruit. Furthermore, the creation of effective supply chains, both through retail chains and other channels, is regarded as important for the development. The strategy is followed up by a governmental action plan, Ecology program, which specifically suggests measures and research that could contribute to sales through channels other than retail chains (Norwegian Agricultural Agency, 2019b).

Based on the previous political goal of 15 % of production and consumption being organic, the government conducted an endeavor named *Organic pilot counties* in six counties in the years 2010–2018 (Skjelvik et al., 2017). Six county governors' agricultural departments had applied to be national pilots, based on the largest types of production in their regions, and they also managed the projects when granted. Each county had an assigned role related to a specific production, and Vestfold County (where the action research part of the PhD study had its center) had this role regarding organic vegetables, focusing on both production and development of markets.

Different Norwegian expert reports relate bottlenecks for the development of organic vegetables to agronomic practices and specialization of production, the labor- and skill-intensiveness of organic vegetable farming, and the competitive and disconnected market situation where a connection between supply and demand is needed (Milford et al., 2016; Milford et al., 2019; Ministry of Agriculture and Food, 2011; Serikstad, 2016). Norway does not have chains of natural food stores that are widespread in several other countries; instead, the retail chains account for the most (of the already limited) sales of organic food, while a small part is sold through independent specialty stores and direct sales channels (Norwegian Agricultural Agency, 2019a). An Official Norwegian Report *Food, power, and powerlessness* (NOU 2011:4) is warning against the concentration of power in the food supply chain, as it consists of a few dominant actors operating in vertical ownerships or collaborations regarding food production, wholesaling, processing, distribution, and retailing. These actors are supplying both individual consumers as well as professional buyers. The report underscores that these dominant actors are blocking alternatives to emerge and influencing what is produced, assortment, and prices in the market. Lately, from autumn 2022, a lot of attention has been directed toward the profit of



the retail chains in times of raising food prices, and whether farmers and consumers are the losing parties.

Consumers only moderately perceive organic farming as more environmental and animal friendly, or safer, than conventional farming (Kvakkestad et al., 2018). This could relate to the high degree of trust in Norwegian food, enhanced through the labeling *Enjoy Norway* initiated by the government to promote Norwegian food (Vittersø & Tangeland, 2015). However, consumers are increasingly aware of food wastage and to eat healthier and more organic, seasonal, local, and vegetarian food (Bugge, 2015). This awareness among consumers and farmers has contributed to the emergence of alternative and local food systems that operate outside the regular food supply chains and focus on different sustainability aspects. Examples of sales channels directed toward individual consumers are farm shops, farmer's markets, Community Supported Agriculture, and REKO networks (Hvitsand, 2014; Leikvoll et al., 2020; Norwegian Agricultural Agency, 2019a). The CSAs and REKO networks, in particular, have grown rapidly in recent years, and I had the pleasure of taking part in research regarding these two emerging phenomena. Today, it exists about 120 CSA farms, according to Organic Norway's webpage, and 130 REKO networks, according to the Norwegian Farmers and Smallholders Union's webpage. As a response to the increased demand (e.g., through REKO networks), so-called market gardens have increased in number (Hvitsand & Leikvoll, 2023; Milford, 2021). Market gardens are farms characterized by a great diversity of crops and often regenerative production methods focusing on soil health and carbon binding, and they usually sell directly to consumers, but also to restaurants, specialty stores, and other nearby recipients. Thus, we see that increased consumer demand leads to increased numbers of CSAs and REKO networks, as well as increased numbers of market gardens selling through these direct channels.

Most alternative and local food systems involve individual customers; therefore, the professional market is mostly under-researched. However, a closer connection between actors within supply and demand at the local level might uncover new potential groups for more sustainable food purchases. Regarding public entities, for instance, the *Advisory committee for innovation and growth in the vegetable sector* suggests that public entities should purchase more locally produced vegetables to stimulate domestic production (Grøntutvalget, 2020). Research examining the hindering and supportive forces for the realization of initiatives in this direction could contribute to valuable knowledge.

The agricultural policy, large-scale producer-owned cooperatives, and retail chains form top-down decision-making structures—or regime structures—in the Norwegian agri-food systems, while the emerging AFNs consist of bottom-up processes and niche activities. Another aspect is that agriculture and food are entangled into other sectors and societal challenges. Taking the perspective of food provision and consumption as potential sources of healthy diets and work opportunities can make room for new and unexplored cross-cutting linkages. Several governmental documents focus on healthy diets and public health through food; for instance, the Norwegian dietary guidelines to citizens recommend eating more vegetables, fruits, and berries on behalf of processed meat and red meat (Norwegian Directorate on Health, 2022). A further goal is to supply and inspire the utilization of local, sustainable, and healthy food to schools and institutions, and cross-sectorial collaboration and innovation are considered important means in this regard, cf. the strategy *The food nation Norway* (Ministries, 2021). There are social inequalities in food consumption and diets due to differences in income, and there are also inequalities in other health and welfare related issues.

One such societal inequality involves the opportunity for meaningful social and work inclusion and training for those outside the labor market, and the Norwegian Labor and Welfare Administration (NAV) administers various labor market measures. With the need to fill different roles to enhance sustainable agri-food development in a financially sound way, I found it interesting to explore the potential for innovative cross-sectorial collaborations (paper 3 and paper 4). For instance, the vulnerability associated with globalization arising, for example, from the dependency on a foreign workforce in Norwegian vegetable production, became apparent during the covid-19 pandemic. Norwegian food security could increase by growing a larger share of the vegetables and, in this regard, also looking to alternative ways of recruiting labor (Hvitsand et al., 2022).

## **5.3 Theoretical perspectives**

In the following, I elaborate on theoretical perspectives that have contributed to the design of the study and explain and discuss the findings. Systems thinking consists of a broad and holistic thinking about complexity and societal change, and multi-level perspective (MLP) consists of a framework for understanding transition at a societal level. I will also elaborate on theoretical perspectives on participation, co-creation, and collaboration as ways to involve, motivate, mobilize, and organize engaged actors, as well as human action. Finally, I present a conceptualization of the PhD research as well as my scientific positioning.

### **5.3.1 Systems thinking**

Systems thinking can help in understanding the whole of messy situations and provide ways of thinking about how change can take place (Bawden, 1996; Checkland & Poulter, 2006; Midgley, 2000). Systems thinking entails different approaches to what a “system” is and can be divided into “hard,” “soft,” and “critical” systems thinking:

“Hard” systems thinking assumes that the different parts or elements of human societies and ecosystems are closely interconnected and that the systems as wholes are different and more than their single parts (i.e., the systems have emergent properties). This implies that challenges cannot be resolved by simple solutions provided by disciplinary and reductionist thinking but must rather be seen as part of a whole (Jackson, 2006). Thus, solving one challenge at a time, such as with technological solutions, could contribute to improving one aspect, while worsening another. Research within hard systems thinking searches to discover causal relationships and dynamics “objectively” and “holistically” between elements in human–nature systems (Bawden, 1996).

The “hard” agri-food systems consist of all activities, actors, institutions, and outcomes related to production, processing, distribution, retailing, consumption, wastage handling, and recycling (Ericksen, 2008; McIntyre et al., 2009). In addition to bringing forth food, these activities influence other economic, welfare, and community issues, as well as animal welfare and the condition of natural elements, such as the climate, soil, water, and biodiversity. Agri-food systems contain interacting sub-systems, such as local food systems (see Seyfang & Smith, 2007). In addition, agri-food systems are interacting with other systems, such as tourism, health, and energy systems, for example, at the local level (McIntyre et al., 2009).

This illustrates the complexity of the situation that hard systems thinking can help to make sense of.

“Soft” systems thinking emerged from action research in response to the perceived insufficiency of hard systems thinking when considering the existence of different and conflicting worldviews (Checkland & Poulter, 2006). The multiple views of reality from different societal actors contribute to the messiness of situations by influencing social interactions, but they also constitute a wholeness of subjective views about improvements regarding a particular situation (Bawden, 1996; Jackson, 2006). A soft system is an abstract concept that can be defined as a constructed system inquiring into and engaging actors to improve a perceived problematic situation. The nature of the problem and ways toward improvements emerge from the process of learning and acting (Bawden, 1996; Checkland & Poulter, 2006). From this process, the differences in worldviews among the participants are made explicit, and different activities could be planned in accordance with the different worldviews.

“Critical” systems thinking can be considered a branch of soft systems thinking that pays special attention to ethical responsibility and power imbalances when working with improvements (Bawden, 2012; Bawden, 1996; Jackson, 2006; Midgley, 2000; Ulrich, 2005). Related to Farming Systems Research, Bawden (2012) claims that an improvement in a sustainability context must be viewed by considering ethical defensibility, ecological responsibility, and social desirability in addition to feasibility and economic viability. This has methodological implications, such as regarding who should participate in the process. This is in line with critical action research, which challenges structural power relations and entails participation and emancipation of marginalized people or groups – though not necessarily explicitly being systemic (Kemmis et al., 2014). It is important that the desire for change comes from those having a stake in the problematic situation (Herr & Anderson, 2015).

Drawing the boundary of a system reflects what is to be included or excluded in an analysis and separates it from its environment (Bawden, 1996; Ison, 2017; Ulrich, 2005). A *system of interest* can be constructed when working with change processes and is bounded according to a specific purpose related to a situation that we want to improve (Ison, 2017). The boundary is influenced by the worldview of the persons

making the boundary judgment, and who is included to participate affects both the process itself and what emerges from it (Midgley, 2000).

Hard systems and soft systems are closely related as there is an interconnection between the object of the research (hard system) and the research process (soft and critical system); that is, collective learning and reflection about the problematic situation and acting to improve it in cyclic manners (Bawden, 1991). The integrated hard system and soft system cycles are illustrated by Vasstrøm et al. (2008) as part of a study involving facilitation of an innovation process at a farm.

### **5.3.2 The multi-level perspective and niches in sustainability transitions**

The multi-level perspective (MLP) is a prominent framework in the field of sustainability transition research in the search for understanding processes of transition. MLP is founded on “hard” systems thinking, as explained in the previous sub-section, focusing on the dynamics between elements and mechanisms hindering or supporting changes. Meeting the sustainability challenges, such as in agri-food systems, requires structural changes termed “socio-technical transitions” (Elzen et al., 2004; Geels, 2011). These *sustainability transitions* involve deep-structural changes in e.g., energy and agri-food systems and entail technology, infrastructure, markets, practices, cultural meaning, policy, and scientific knowledge. According to the MLP, “transitions as non-linear processes can result from the interplay of three analytical levels: niches (the locus for radical innovations), socio-technical regimes (the locus of established practices and associated rules that stabilize existing systems), and an exogenous socio-technical landscape” (Geels, 2011, p. 26). The concepts of *regime*, *niche*, and *landscape* are explained theoretically and in relation to agri-food systems in the following:

*Regime* consists of the socio-technical configurations that characterize the current dominant situation, such as rules, routines and practices, beliefs, norms, and scientific conduct (Geels, 2011). The stabilizing features of regime generally lead to only incremental steps to remedy problems, while radical innovations have difficulties to diffuse due to the lock-ins. Regime actors are often opponents of change, although changes can also come from inside regime entities (Turnheim & Sovacool, 2020). In agri-food systems, regime relates to industrial agriculture, processing, distribution, and standards for quality and aesthetics, as well as

governance, policy, and knowledge systems working in a mutually supportive co-evolution (see Lamine et al., 2012).

*Niches* are arenas in which radical ideas for social and technical transitions emerge through participation and collaboration. Niches can be nurtured and empowered in “protective spaces,” which shield niches from market forces and power imbalances (Schot & Geels, 2008; Smith & Raven, 2012). These spaces could be in the form of available financial resources or the establishment of a temporary incubator unit (Smith & Raven, 2012). Niche processes consist of problem framing, articulation of expectations and visions, building networks, the enrollment of more actors, and learning at multiple dimensions (Schot & Geels, 2008; Seyfang & Smith, 2007). The place specificity matters for the development of niches and could be supported by regional and local visions; territorial norms, values, and practices; and natural resource endowments, as well as customer demand and opportunities for local market development (Hansen & Coenen, 2015). Niches occur both at the local project level and at the “global” niche level (Schot & Geels, 2008). Regarding niches in agri-food systems, the locally embedded niche innovation would be e.g., the CSAs or REKO networks while the global niche would be Alternative Food Networks.

The *landscape* is the wider context in which both regime and niches exist and develop. It includes the technical and material backdrop of society, “demographic trends, political ideologies, societal values, macro-economic patterns,” and rapid external shocks (Geels, 2011, p. 28). In the context of agri-food systems, the landscape could be consumer trends and prevailing values. Feola (2020) argues that capitalism could not be considered a mere landscape factor when studying transitions to sustainability, as it permeates the functioning and logics of our societies. The influence of the principles of individualization, competition, productivism, economic growth, and market mechanisms needs critical consideration, for instance, regarding prerequisites of emerging niche innovations.

Niches alone will not source wider changes, as niches need help from broader forces and processes to change regime (Seyfang & Smith, 2007). Changes in the landscape can create opportunities for niches to develop, such as in times of increased public awareness and shifting trends (Geels, 2011). For instance, increased awareness among citizens could enable shifts in practices in public procurement toward fresh, local, and organic food (Bui et al., 2016; Seyfang & Smith, 2007).

Niche–regime interactions have complex dynamics and adoptions to each other, and regime actors can be involved in transitions (Elzen et al., 2012; Ingram, 2015; Turnheim & Sovacool, 2020). “The creation of concrete alternatives to the conventional ways of producing, selling and consuming, generates tensions with the context in which they operate, and trigger processes of change at higher level,” e.g., by challenging “dominant values and behavioral norms” (Lamine et al., 2012, p. 241). Niche innovations are subject to the rules of the regime in everyday conduct; thus, intersections between niche and regime can create tensions that impede sustainability transitions (Audet et al., 2017). Food initiatives that are developed at the crossroads of alternative and dominant food systems are characterized as *hybrid* (Lamine et al., 2012). Experiments involving regime actors in the community, such as public entities and market actors, create both opportunities and new challenges in transition processes, and contribute to knowledge about processes of wider changes (such as the opportunities and challenges explored in paper 3 and paper 4).

Although MLP is originally anchored in hard systems thinking, I find that the soft and critical systems thinking could add a valuable dimension to niche innovations. The development of niches involves those having a desire to be part of a network promoting the niche, and it enhances knowledge development, common values, and aims to create changes. The concepts of protective space, agency, and collective action could relate to soft and critical systems thinking to the degree that these are spaces for creating and nurturing niche innovations and addressing power structures that hinder changes to take place.

### **5.3.3 Participation, co-creation, and collaboration for sustainability**

The term *participation* concerns how people take part in something and are related to a larger whole (Wiktionary, 2023). Participation concerns the process during which individuals, groups, and organizations are consulted about or can become actively involved in a project or program of activity or in a decision made based on the participation of shareholders. Thus, participation is about how people engage in social activities and decision-making processes. To *collaborate* is defined as working together with others to achieve a common goal (Wiktionary, 2023). Collaboration “entails decreasing our pursuit of individual independence, goals, prowess, and pride, and increasing our pursuit of and contribution to the common good, the strengths and higher goals of our local and global communities” (Zuber-Skerritt, 2012, p. 16).

Pretty (1995) developed a typology of how people participate in development programs and projects, with Caporal (1998) adding the seventh item. In this typology, participation ranges from 1) manipulative participation, 2) passive participation, 3) participation by consultation, 4) participation for material incentives, 5) functional participation, 6) interactive participation, and 7) supported participation to 8) self-mobilization. The first four types represent more passive participation, which does not encourage interactions between participants and researcher. In an agroecological context, the goal is to have more active participation, characterized by the last three types of participation (Cuéllar-Padilla & Calle-Collado, 2011). With partly citing Cuéllar-Padilla & Calle-Collado (2011, p. 393, referring to Caporal, 1998) and Pretty (1995, p. 1252) the following characterization belongs to the different forms of participation relevant for agroecological contexts:

*Interactive participation* is suitable in cases with diverse community actors and less experience of social organization. People participate in joint analysis, development of action plans, and formation or strengthening of local institutions. Participation is conceived as a right, rather than simply a means to achieve project goals. This approach facilitates systemic and structured learning processes. Groups can take control over local decisions and determine how available resources are used.

*Supported participation* is when people work together, supported by external teams who respect their collective dynamics of social action and, at the request of the participants, overcome certain weaknesses in collective learning processes. Decisions are at the responsibility of the participants.

*Self-mobilization* is when people take initiatives largely independent of external institutions to change systems. They develop contact with external institutions if in need for resources or advice but maintain control over the process and resources. Self-mobilization can spread if governments and NGOs provide supportive frameworks.

According to this typology, we can characterize participation in CSAs to be engaged in a self-mobilized initiative, and participation in the action research part of the PhD as a mix of interactive and supported participation (the actual participation being described in section 5.4.3). Engagement in participatory processes and dialogues



can empower citizens and others by transforming power and roles and improve a situation or a service, based on equality of the different voices involved (see also Andersen et al., 2018; Egmoose, 2016). A specific form of participation, and often related to innovation processes at the level of projects or groups, is co-creation. Co-creation is about creating something new together (a service, product, process, etc.) and can be a strategic tool for the involvement of different actors to create insight, understanding, and learning (Andersen et al, s. 20, Bulkeley et al., 2016). Co-creation encompasses the co-creation of knowledge and ideas for innovations and is often the term for the innovation processes taking place in, for instance, Urban Living Labs (Bulkeley et al., 2016). Concrete collaborations, entailing the further development and the production phase of a service, can emerge from the co-creative processes, assuming long-term interdependency among involved actors (Andersen et al., 2016).

In the context of the PhD research, *participation* can take place in co-creative processes and in the collaborations of “producing” a service or product aimed at increased sustainability in agri-food systems. As both entail participation, I utilize the term *collaboration* when referring to the collective action of conducting the activities in the AFNs of CSAs and Green Parallel, while the researcher-aided processes in the living lab and during the piloting is termed as *co-creative*. Thus, with reference to the two sets of studies (Figure 1), participation and collaboration can take place within the frames of self-organized AFNs, such as Community Supported Agriculture, as part of a social movement (paper 1 and paper 2) or as researcher-facilitated participatory and co-creative processes with creation of and collaboration in an AFN through action research (paper 3 and paper 4).

### **5.3.3.1 Social movements—self-organized collaborations**

A specific type of collaboration is collective action in social movements, where a social movement is defined as a “collective action by a group of people with a shared or collective identity based on a set of beliefs and opinions that intend to change or maintain some aspect of the social order” (Bell, 2013). The collective action of AFNs commonly emerges from the grassroots as bottom-up initiatives of joint commitment at the community level, commonly being termed social movements (Lamine et al., 2012). In an agri-food context, these initiatives are based on a common desire to collaborate on alternatives to the mainstream ways of producing and consuming, and key persons contribute to bring in capacity, competence, finances, etc. (Lamine et al., 2012; Seyfang & Smith, 2007). However, although the

purpose of participative social movements is to oppose the dominant forces of capitalism and its attendant injustices, individuals within AFNs might have goals diverging from this (Tregear, 2011). The degree of commitment among participants are positively influenced by participation in activities that build social relations in the sense of mutual trust, shared goals, and network ties, as well as transparency (De Bernardi et al., 2020), and sustainability values and practices are reinforced by participation and learning in AFN (Forsell & Lankoski, 2015). Knowledge about what motivates people and makes them commit to collaborations is valuable, as these are opponents of the unsustainable aspects of the current agri-food system and can give insight into the development of more sustainable niche innovations.

### **5.3.3.2 Action research in place-based living labs – researcher-organized collaborations**

In situations where change-oriented actors do not find each other on their own, learning and change processes can be facilitated by an outside actor (Herr & Anderson, 2015; Kivimaa et al., 2019). Action research is an approach that can facilitate the inclusion of different kinds of knowledge in change processes, where affected actors take part in cycles of actions and reflections, adjusted actions and so on (Herr & Anderson, 2015). According to the founder of action research, Kurt Lewin, the best way to understand a social system is to try to change it as it is possible to make an adequate diagnosis of a problem (Schein, 1996). Furthermore, in the context of action research or in sustainability experiments, the participation in learning processes has been shown to give added value, such as heightened awareness and understanding, ownership, trust, learning, commitment, and accountability among participants (Darnhofer et al., 2012; Greenwood & Levin, 2006; Luederitz et al., 2017). These factors are important for fruitful processes and collaborations and can increase the capacity to act through collective action. Authentic collaboration in action research “is bound to notions of joint work, consultation, involvement, and participation; it is based on shared goals and shared vision, openness, trust, and democratic ideals” (Piggot-Irvine, 2012, p. 90). An “outside” researcher can contribute to create possibilities for the participating actors as well as to generate transferable knowledge to the scientific community, requiring skills in both scientific methods as well as in being a coach through process facilitation (Greenwood & Levin, 2006; Levin, 2012).

As agri-food systems are complex, consist of several and diverse actors and interact with other systems, it is a call for holistic approaches to sustainability transitions,

looking across production-consumption lines and across societal sectors, as well as involving a diversity of actor types (see Introduction). The participation of a diversity of actors could add capacity and a broader knowledge base to change processes and create innovative pathways and “solutions”. Based on this, I found that elements of the place-based innovation platform *Urban Living Labs* (ULL) were suitable to combine with action research, due to ULLs specific characteristics: Urban Living Labs are open innovation platforms suitable for experimenting with sustainability transitions where it is a need for innovative thinking (Bulkeley et al., 2016; Hvitsand & Richards, 2017; Steen & van Bueren, 2017). They are designed to facilitate the mobilization of a diversity of actors in specific places crossing sectors and actor types, i.e., from the private and public sector, research, and civil society. ULL focuses on participation and involvement of actors throughout the whole learning and innovation process; from co-creating a common problem understanding, visions and ideas, to piloting ideas that could lead to the desired development. Facilitated participatory and co-creative processes has an empowering effect on participants, in the sense that it increases networks, learning and the access to take part in decision-making (Steen & van Bueren, 2017; Vatn, 2015). The innovation process could be facilitated by a research institution, municipality, or non-governmental organization, and can enable the connection of top-down and bottom-up processes in places (Hvitsand & Richards, 2017). To gain insight into the role of a shared vision for the output of an innovation processes would add knowledge about the transition potential of such processes.

Processes in action research are most often termed *participatory* or *collaborative*, while processes in place-based living labs are more commonly termed *co-creative*. The meaning of these terms is not significantly different from each other, although action research is more often aiming for *improvements* (e.g., in Bradbury (2015); Ison (2017)), while ULL has a specific focus on *innovations* (Bulkeley et al., 2016). Both action research and living labs focus on learning and reflection. Living labs have only lately been connected to the term action research, but they are connected to the term transdisciplinary. Conducting action research by borrowing certain characteristics from living labs could strengthen the action research by adding a stronger orientation toward innovation and cross-sectorial participation. Paper 3 elaborates on the argument for the connection of action research and place-based living lab approaches to change and learning, and this is also illustrated in section 5.4.3.1.

### 5.3.4 Theories of human action and change processes

The theory of rational choice assumes that people maximize individual utility based on their available resources and have full information about alternative choices (Vatn, 2015). According to such *individual rationality*, action is instrumental and strategic, with the calculation of what is considered most beneficial for oneself. Furthermore, the theory assumes that people make decisions without being influenced by society following the logic of the market.

In contrast to individual rationality is the theory of *social rationality*, which acknowledges that people's choices are motivated not only by their own benefit, but also by what is normatively appropriate behavior and "right to do" (Vatn, 2015). This entails a *we-rationality* and can be considered as reciprocity within a group, and a *they-rationality* with concerns about what is right to do for others, for instance future generations. Furthermore, the theory assumes that there is a relationship between human action and the prevailing institutions, i.e., conventions, norms, and rules according to institutional economy. As part of this is habituated and routinized behavior, both being reasoned and automated. Due to the interplay between the actors and the institutions and structures, the institutions and structures can be modified over time because of individual and collective action (Leach et al., 1999). Individuals can affect changes in a broader sense through their agency, but at the same time prevailing rules, norms, culture, and "ways of doing things" (i.e., the institutions) are influencing the perceptions, interests, and values, and thus behavior, of individuals (Vatn, 2015). Thus, for people to change behavior, there is a need to change what society perceives as the "right" behavior. Behavior is decided by preferences, which are formed by culture and societal processes, and norms can change with new norms being internalized. For instance, and related to agri-food systems and the multi-level perspective, Ingram (2015) argues that niche ideas and practices can be translated and communicated into regime through organizations facilitating dialogues, learning, exchanging ideas, coordinating, and linking actors.

«Markets tend to foster individual rationality also in the sense that social relations are largely transformed into instrumental ones”, but also reciprocity and moral aspects are considered, for instance, when in a purchasing situation (Vatn, 2015, p. 120). With reference to studies of motivations of farmers, “participation in collective action can actually rarely be reduced to maximizing personal utility, as it is often motivated by seeking benefits of the community, such as maintenance of traditions and cultural identity, or enhance biodiversity through environmental management”

(Darnhofer et al., 2012, p. 16). Also, because decision-making processes suffer from a lack of information about all the different choices and their impact (Vatn, 2015), it is interesting to consider whether the establishment of an arena for learning and collective action and collaboration (also between producers and purchasers) could contribute to improve information flow relevant for decision-making.

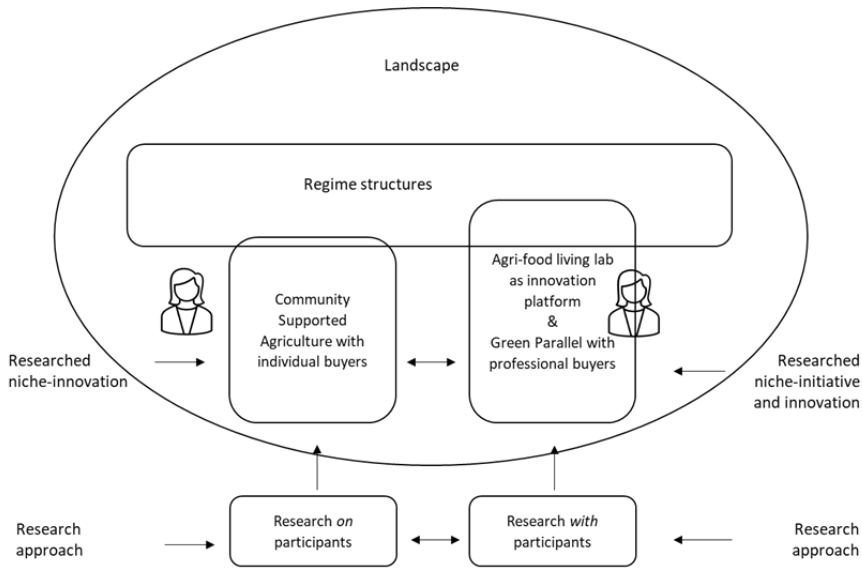
Collective actions are regarded as essential for handling societal problems, such as that of sustainability, as the act of one person alone can easily be overlooked and more can be achieved collectively (Vatn, 2015). To collaborate with a purpose of addressing specific challenging situations entails focusing on what is right or appropriate to do for the group and can be considered an act of solidarity according to social norms. However, collective action might face challenges, and the willingness to collaborate depends on the willingness to do so and efforts by others, i.e., the willingness is conditional (Vatn, 2015). Ostrom (2020), usually referring to natural resource governance of public goods, describes mutual trust and reciprocity of benefits as an important factor for the long survival of self-organized collective action. Individuals vary in how willing they are to initiate reciprocity to achieve the benefits of collaborating. Individuals also vary in their tolerance for others not contributing, and thus the effect this has on their own contribution varies as well. Lack of commitment of those involved can lead to suffering that is called “the tragedy of the commons,” which has been studied according to the commitment of consumers to AFN (De Bernardi et al., 2020).

According to Kurt Lewin’s field theory, individuals in a change situation perceive different forces that either resist/hinder or drive/support the changes, which creates tensions (Burnes & Cooke, 2013; Schein, 1996). The performance of the group, or in our case, the niche-innovation group, will depend on the interaction between the persons in the group and the environment, as well as intrapersonal tensions from forces pulling in differing directions. Often, the sum of the forces tends to lead to a maintenance of the current behavior even though an intervention for change is introduced; this situation being called the “quasi-stationary equilibrium” (Schein, 1996). The introduction of a driving force for change often produces an immediate counterforce, which could be related to personal psychological defenses, group norms, or routinized behavior. Notably, a change has a better chance to become lasting if the involved persons themselves have taken part in creating the solution or intervention for change, and there has been a period of trial and error. In paper 4, I utilized elements of field theory (Burnes & Cooke,


2013; Schein, 1996) and institutional economy to analyze and explain the forces and tensions that occurred at the personal, group, and entity level and how this influenced individual behaviors when the niche innovation of Green Parallel was entangling with regime structures. In parallel, also Kump (2023) caught the interest of the connection between the multi-level perspective and field theory, conceptualizing how field theory could contribute to better understanding of agency and the individual level in sustainability transitions.

### **5.3.5 Conceptualization and scientific positioning of the PhD research**

Both in the context of self-organized and of facilitated participation and collaborations, I find it of interest to explore values and visions, motivations, proximity dimensions, and other factors that could lead to a desire and ability to participate and generate change through acting collectively. Alternative food networks are often founded on participation, collaboration, and collective action within a geographical area, and I suggest that they can teach us about how collaborative approaches can be motivated and organized and what is important for them to sustain and contribute to sustainability transitions. Based on this, I argue that we can learn a lot by studying an existing model of niche innovation that has been shown to sustain over time, such as the AFN of Community Supported Agriculture (CSA), which has a relatively small degree of interaction with regime as it consists of a direct producer–consumer relationship. A second approach is to facilitate and study a change initiative, a constructed soft and critical system, to develop knowledge about the establishment phase of change initiatives and an AFN in the making with a high degree of interaction with regime as a producer–professional buyer relationship. These two sets of studies have different approaches to participation and collaboration with different contexts, such as regarding the interaction with regime and role/positioning of the researcher, as illustrated in Figure 1.



*Figure 1: Conceptualization of the PhD research: The research approaches and the researched niche innovations interacting with regime and landscape*

 = researcher

There are different worldviews or paradigms regarding philosophy of science, i.e., positivist/post-positivist, interpretative/constructivism and critical, including transformative) (Creswell & Creswell, 2018; Merriam & Tisdell, 2018). A positivist/post-positivist perspective aims to understand causal relationships, assuming that an objective reality is observable and measurable, and is presented numerically and usually using quantitative research designs. An interpretive/constructivist perspective aims for a deeper understanding of people’s experiences and what meaning they give to their experiences, assuming multiple interpretations of the world and of situations, and is presented by words and illustrations using qualitative research designs. A critical perspective aims to understand how different interests of some societal groups are perpetuated at the expense of others, thus addressing biases in power. According to Merriam and Tisdell (2018, p. 59), “these types of studies are collectively critical in the sense of their theoretical framework that informs the study and their analysis of power relations”. A critical approach could also include a transformative worldview and action research with the aim of contributing to challenge power biases and to changes during the study.

As described, there are lock-ins to the current unsustainable situation in agri-food systems where the concentration of power is considered a main barrier for shifts toward sustainability (IPES-food, 2016). For this reason, I took a critical research approach (Merriam & Tisdell, 2018) when studying initiatives and niches that could present alternatives to the current agri-food regime (see section 5.2.1).

Furthermore, I recognize that there are several ways of conducting research, and which approach to take depends on the research problem to be addressed. This view represents an epistemology with a pragmatic stand for research and the acquisition of knowledge (which Creswell and Creswell (2018) label a worldview of its own). Pragmatism suggests a purposeful combination of different worldviews or paradigms regarding the philosophy of science and a mixed methods approach. In my research, this entailed utilizing both quantitative and qualitative research designs with mainly inductive and explorative approaches, with one study being deductively oriented (paper 2).

The CSA studies aim to understand the values, motivations, and proximity dimensions attracting engagement in a seemingly successful niche, as well as discussing its potential for influencing the existing regime. The CSA studies are anchored in the positivist, interpretative, and critical paradigm and are studying the “hard” system of CSA (i.e., its actors, activities, and institutions) and its relation to the external environment. Furthermore, I believe that research can contribute to changes, and that action research is suitable for value-driven research with sustainable development agendas (Zuber-Skerritt, 2012). This includes “soft” and “critical” systems approaches that are used, for instance, in farming systems research and agroecology (see e.g., Bawden, 2012; Darnhofer et al. (2012)), emphasizing the ethical dimensions of farming and the responsibility of conducting research considering what is ethically “right” to contribute to (Bawden, 2012). Thus, I additionally used a critical transformative paradigm in the PhD research, as I wanted to contribute to changes in the specific situation as well as create generalizable knowledge. In this part of the research, the change process was done with the actors as participants and co-researchers (Reason & Bradbury, 2008) rather than on them, as was the case with the CSA studies. The basic assumption behind this is that, in cases where actors do not organize themselves, coordinated participation of change-oriented societal actors in transition processes could encourage empowerment and change to take place through collective learning and action.



I do believe that what I found using the combination of different approaches and methods to be presented will contribute to the body of knowledge within the field of niches and food system changes. Nevertheless, a risk remains that the respondents, informants, and participants will speak or act in ways that could mislead the answering of the research questions according to different rationalities and experienced forces (see section 5.3.4.).

## **5.4 Research methodology**

In the following, I explain the research strategy, research design, and methods.

### **5.4.1 Overall research strategy and research design**

The research strategy, research design, and methods were chosen to answer the overall objective of the thesis, which was to explore how participatory and collaborative approaches can be motivated and organized and how they can contribute to sustainability transitions in agri-food systems. The strategy was to obtain this knowledge by studying niche initiatives and innovations that already existed, as well as by facilitating and analyzing initiatives and innovations in the making. More concretely, this was done by a) studying the well-established niche innovation of Community Supported Agriculture (CSA), and b) facilitating and analyzing the establishment of a change initiative and the piloting of a co-created local food system named *Green Parallel*. Both represent participatory and collaborative approaches to change, where CSA is not researcher-initiated while the other initiative is. These approaches can—in different ways in terms of content, emergence, and experiences—shed light on how niche initiatives can enhance sustainability transitions in agri-food systems.

The studies on CSA were focused on values, motivations, and what makes CSA attractive to the involved producers and consumers, as well as its potential to contribute to more sustainable agri-food systems. This knowledge contributed to a valuable framework of understanding when I was planning, facilitating, and analyzing the researcher-initiated processes for changes taking place in a situation where the development of organic vegetables seemed to have stagnated. Furthermore, knowledge about CSA as a collective action contributed to perspectives relevant to understanding and contrasting the more complex collaboration with the involvement of professional buyers (in *Green Parallel*) rather than individual consumers, as in CSA.

For a broad investigation, I applied a mixed methods approach, with both quantitative and qualitative research designs (Creswell & Creswell, 2018; Merriam & Tisdell, 2018). This generates a more exhaustive understanding of what was researched when drawing interpretations and enhances generalizability, as well as reducing the weaknesses of the different methods.

All the papers employ case study designs. Case studies are purposeful for studying complex phenomena in their contexts, such as regarding social or group phenomena, to obtain a holistic understanding of the phenomenon and potential casual relationships (Yin, 2013). The two CSA studies had multiple case farms, while the action research studies constituted a single case. Several methods are utilized in each study, which is of special importance in single-case studies (George et al., 2005; Yin, 2013), as well as including standardized methods and tools to secure validity (Levin, 2012; Yin, 2013).

Most of the empirical work took place in the Vestfold region in Norway (see Figure 2), although parts of the CSA studies collected data in national and cross-national contexts. Three of the farms involved in the action research (although to varying degrees) were CSA farms. Two of these farms also contributed to one or both CSA studies.

Table 2 summarizes the research question, geographical area of study, research design, methods, and selection of cases and participants, as well as the analysis of each paper. The methods, selection, participants, and analysis are explained in the following subsections, and an elaboration of the processes of the action research is provided.

Paper	Research question	Geographical area	Research design	Methods	Selection/ participants	Analysis
Paper 1	Why do people engage in CSA?  How can CSA be a transformational act for producers and consumers toward food system changes?	Norway, nationwide	<i>Mixed methods</i> Descriptive mapping Case studies (multiple case study)  Survey	Semi-structured qualitative interviews (individual and group) and observation at five farms  Questionnaire with quantitative (closed) and qualitative (open) questions	Study of CSA documents and internet sources 17 producers (farmers and growers), managers and/or core group members, other resource persons  Members at all Norwegian CSA farms at the time (seven), 449 responded	Basic content analysis  Qualitative data: Basic content analysis  Observation: Not any specific analysis Quantitative data: Descriptive analysis  Qualitative data: Citations used to support quantitative data
Paper 2	How are spatial and relational proximity within and outside CSAs related to the attractiveness of CSAs in (peri-) urban contexts?	Cross-national study: Austria, Japan, Norway	Observation and focus group interview at a national CSA network meeting  Cross-sectional case study (multiple case study)	Focus group interview/dialogue  Questionnaire with quantitative (closed) and qualitative (open) questions	12 existing and new producers (farmers and growers), managers and core group members, Organic Norway employees  All farmers/growers and members at six case farms, two in each country, 209 respondents	Basic content analysis  Quantitative data: Principal component analysis and multiple regression analysis  Qualitative data: used for giving depth to quantitative data
Paper 3	How do we discover and select sectors and actors to be	Vestfold, wider region	<i>Action research with multiple qualitative methods</i>			

involved in developing innovations in organic vegetable agri-food systems to overcome obstacles and discover overlooked opportunities?		Descriptive mapping Single case study	Semi-structured qualitative interviews  Participatory and co-creative dialogue processes in workshop, including participant evaluations  Reflections by the researcher	Study of documents and internet sources 48 interviewees; farmers, other agri-food actors, actors from other societal sectors  30 participants; farmers, other agri-food actors, actors from other societal sectors  During and after the workshop	Basic content analysis  Basic content analysis  Thematic analysis  Basic content analysis
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?	Vestfold, central parts of the region	<b>Action research with multiple qualitative methods</b> Single case study	Semi-structured qualitative interviews (individual and group)  Reflections by the researcher, coordinator, and participants	25 interviewees; participants and non-participants of Green Parallel  During and in-between the workshops	Thematic analysis  Thematic analysis
Paper 4 Which forces and tensions hinder or support the viability of a co-created alternative food network of organic vegetable producers and professional buyers?					

## **5.4.2 Methods and analysis paper 1 and paper 2**

The context for paper 1 was the rapid increase in the number of CSAs in Norway, which had only one farm in 2006 and seven farms at the time of the study in 2013/2014. In 2019, when the cross-national study for paper 2 took place, Norway had approximately 80 farms and the number is still continuously increasing. By contrast, Japan experienced a decline in the number of CSAs and Austria experienced a stagnation.

The CSA studies were bounded by the phenomenon of CSA, as a niche innovation and a sub-system, within the larger agri-food systems. The studies concern both niche internal issues as well as issues regarding the interaction with structures external to the CSA.

### ***Paper 1***

To obtain knowledge about why people engage in Community Supported Agriculture, and to discuss its transformational potential, I utilized both qualitative and quantitative research designs with the following methods and data: a) semi-structured interviews of key stakeholders and visits at five CSA farms (case study), b) an electronic survey to CSA members at all seven farms, and c) focus group interview at a national network meeting for the CSA farms facilitated by Organic Norway. The data were collected in the order shown. The data collection had an exploratory sequential design (Creswell & Creswell, 2018), where the interviews informed the formulation of questions in the survey. After the survey, the focus group interview covered subjects that I wanted more in-depth views about.

To understand the phenomenon of CSA through how it was organized, and through the values, attitudes, and motivations for joining, the study was inductive and open in the search (Creswell & Creswell, 2018; Merriam & Tisdell, 2018).

In total, 17 persons were interviewed individually or in groups at the five case farms. The interviewees were farmers at the producer-driven farms and hired growers at consumer-driven farms, as well as core group members (consumers) and other resource persons. The interviews were done to obtain data about farm characteristics, involvement of members, forms of collaborations, economic issues, motivations for engaging, learning and social activities, and outcomes. The interviewees were also asked about perceived opportunities and challenges related

to these issues. The data from the interviews and farm visits were descriptive and were subjected to a basic content analysis.

To further explore the consumer perspective an electronic questionnaire was sent to members at all seven CSAs in Norway at the time. They were asked about socio-economic variables and how they were involved in the farm. Furthermore, the questionnaire had questions to obtain insight into attitudes, values, and motivations behind their engagement in CSA, as well as experienced changes in awareness, practices, and knowledge.

Most members were individual consumers, with a few exceptions. CSA members at five of the farms belonged to the farms that were also subjected to interviews and farm visits. Three of the seven farms were new the year of the study, and only one of these was subject to interviews. The farm managers provided email lists of the contact person in each member household, which constituted 746 questionnaire receivers in total. The number of respondents was 449.

The questionnaire consisted of both closed- and open-ended questions. The questions about attitudes, values, and motivations were closed ended and were presented as statements, to which the respondents were to declare their disagreement or agreement on an interval scale. The statements were formulated based on knowledge from the interviews and literature, and they related to participatory, environmental, health, social, cultural, and economic aspects. The results of the closed-ended questions were analyzed in SurveyXact and presented as average scores for each statement. The analysis was mainly descriptive to understand why people engaged in CSA but also pointed to connections, such as the correlation between high degree of motivations and a high degree of involvement in the activities at the farm. In addition, the respondents were given the opportunity to add information and views in the open-ended questions, which I utilized to give depth to the quantitative analysis.

Based on the knowledge obtained from interviews and the questionnaire, I conducted a focus group interview (in practice being a dialogue between the participants) at the network meeting to enrich the material, as well as to establish what they considered advantageous with CSA and success factors and challenges they had experienced – these indirectly contributed to the research questions.

The study was financed by the Norwegian Agricultural Agency and conducted in 2013/2014. The paper focuses on parts of the entire study reported in Hvitsand (2014).

### ***Paper 2***

Knowledge about the relevance of different proximity dimensions for the attractiveness of CSA was obtained through a cross-sectional study with a quantitative research design and a survey conducted at case farms in three countries: Austria, Japan, and Norway. Paper 2 was anchored in theory about proximity and literature about CSA, including previous studies by the co-authors in Norway and Austria (paper 1; Gugerell & Penker 2020), to operationalize proximity dimensions for CSAs. The study had a deductive approach and tested a hypothesis regarding the expected relationship among the variables (Creswell & Creswell, 2018).

The study was a case study with multiple cases (Yin, 2013) consisting of six CSA farms, two in each country. The countries were chosen as they have different national contexts with different development of the CSA movements. The criteria for case selection were that the farm was situated in or close to different urban areas, and that the farms had organizational similarities with each other (i.e., collective price negotiation, year-round commitment of members and participative decision-making processes).

The questionnaire, generating data to the proximity variables, targeted owners, managers, and members of the CSAs. They received questions regarding socio-economic variables, their way of engaging in the CSA, including motivations to join and attitudes toward the current dominant agri-food structures, and the spatial contexts of the CSA. Owners, managers, and others in a leading position received additional questions about the political context, the CSA interaction with other CSA, and about actors who supported or impeded the CSA. Most questions were closed ended, in the form of multiple-choice questions with single or multiple answer selection or statements with interval scales regarding degree of disagreement or agreement. A few open-ended questions were also provided where elaborations on answers were possible.

The questionnaire was electronically distributed in Norway (sent from the owner or manager by email), while the answers were collected manually at the farms in



Austria and Japan. The number of CSA members receiving the questionnaire was approximately 740, with 209 respondents, who presumably represented one household each. The questions were first developed in the author group in English, then translated to the three national languages. After the data were collected, the questions and answers were translated back into English.

The questions captured perceptions regarding CSA-internal proximities among those involved in a CSA, as well as questions capturing perceptions regarding proximity of those involved in CSA to external actors, structures, and resources (CSA-external proximities). To test the hypothesis that “there is a positive correlation between all dimensions of relational proximity and attractiveness, except for institutional and organizational proximity to external actors”, it was first conducted a principal component analysis where different proximity items from the questions were aggregated. This resulted in five proximity variables (i.e., principal components, presented in the results section), which served as different explanatory independent variables in the multiple linear regression analysis where the dependent variable was the attractiveness of CSA.

In the next step, the importance of each variable on the attractiveness of the CSA was analyzed with multiple linear regression analysis. Due to lack of correlations or of respondents regarding institutional and organizational proximity, these were excluded from the regression analysis. The results from these questions were subjected to descriptive analysis based on statements where answers were given on an interval scale. These results were presented as average scores or the answers were qualitatively described.

Both analyses were conducted using SPSS software, and tests for internal consistency and statistical significance were conducted.

The paper was a co-authorship and collaboration between BOKU in Austria, University of Tokyo in Japan, and NMBU in Norway. My contribution in the study was conceptualization, methodology, data collection, writing, review, and editing.

#### **5.4.3 Process, methods, and analysis paper 3 and paper 4**

The county of Vestfold (shown in Figure 2) and its surrounding regions are well suited for vegetable production and have long traditions in doing so. The action research part of the PhD study had its center in this region, which, over several

years, had the assigned role of being a national pilot region for development in production and markets for organic vegetables managed by the County Governor's Office agricultural department (Skjelvik et al., 2017). Despite several valuable outputs from being a national pilot, the desired outcome regarding increased production and consumption of organic vegetables was difficult to achieve.



Thus, I wanted to utilize action research to facilitate dialogues and co-creation to contribute to strengthening organic vegetable agri-food systems in the region. In this, the agricultural department at the County Governor's Office was the main collaborative partner, contributing with legitimacy of initiative, knowledge, and experiences and covering direct expenses of the first workshops.

Figure 2: The Vestfold region

In the following, I explain the participatory and co-creative processes before elaborating on methods and analysis.

#### 5.4.3.1 The participatory and co-creative process

Perspectives from systems thinking, action research, place-based (urban) living labs, and multi-level perspective were merged to create a purposeful theoretical and methodological anchoring of the initiative (see section 5.3.3.2. and paper 3).

Figure 3 shows the facilitated process consisting of three processual phases: introductory work, agri-food living lab activities, and piloting of the co-created innovation. The illustration shows a linear process, but actually it was evolving and moving back and forth between the different elements as I took a pragmatic approach to the process (Greenwood and Levin, 2006).

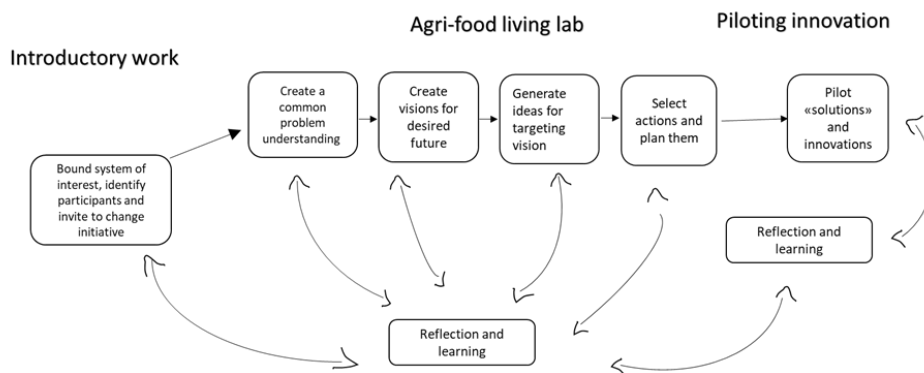


Figure 3: The phases in the participatory and co-creative processes

The entire process took place during a three-year period; from the autumn of 2017 to autumn of 2020.

### **The introductory work**

The introductory work consisted of bounding the *system of interest* (Ison, 2017), gaining preliminary insight, and selecting and recruiting actors (Greenwood & Levin, 2006).

The overarching purpose or intention of the action research, which was to contribute to strengthen organic vegetable agri-food systems, bounded system of interest. I labelled this system an “agri-food living lab” and conceptualized it as a protective space (Smith & Raven, 2012) with the inclusion of change-oriented actors with a diversity of perspectives and knowledge. Change-resistant actors were not included to avoid power imbalances and a potential hampering of the change process (Avelino, 2017; Kemmis et al., 2014). To accommodate the need for exploring potential new collaborations, I took a cross-sectoral and multi-actor approach, and I developed and applied a procedure for selecting and recruiting change-oriented actors from within and beyond the agri-food domain. This procedure assumed extensive contact with relevant actors and was entangled in gaining preliminary insight into the situation to lay the groundwork for the first participatory and co-creative process (see section 5.4.3.2. for more information about methods).

### ***The agri-food living lab***

The participatory and co-creative process in the living lab was structured as a platform for collective learning and acting. The processes included a) creating a common understanding of the problematic situation, b) creating visions for the desired future, c) generating action ideas for targeting the visions, d) selecting actions and planning them, and e) testing “solutions” and innovations, as well as f) reflecting on experiences (in all stages) (Bulkeley et al., 2016; Greenwood & Levin, 2006; Hvitsand & Richards, 2017; Steen & van Bueren, 2017).

Creating a common understanding of the problematic situation and creating visions was conducted in one workshop (workshop 1, see section 5.4.3.2. for more information about methods), and one main purpose of these processes was to identify gaps between the current and the desired situations. The next step was to generate ideas for actions that could fill the gaps between the perceived problematic situation and the vision about the future situation, which took two workshops to conduct (workshop 2 and 3). Until this point, the processes had been divergent and open, but after the three first workshops, the processes became more convergent with the selection of which ideas to realize and plan for (see Heron & Reason, 2008, about convergent-divergent phases). Two main ideas stood out for further close exploration, and both were followed up through separate workshop processes of concretization and action planning (workshop 4a and 4b). One of these workshops resulted in a decision to pilot a solution that enclosed the main idea of the topic (i.e., they decided on testing a local and alternative food system named *Green Parallel*). See Box 1 about the two directions of actions from the two workshops and my thoughts about why only one of them was realized.

One workshop was concerned with the desire to create a local food system including restaurants, public entities and specialty shops, i.e., professional buyers. The other workshop was concerned with creating activities to enhance more crop rotation in collaborations between vegetable and ruminant producers. More actors, being more specific to these ideas and topics, were invited to these workshops. The idea of “Green Parallel” as a local food system emerged in the first workshop based on a great engagement for collaborating on logistics and create closer contact between producers and buyers, which was regarded by the participants to be an urgent barrier for further development. The other idea was more based on literature and expert knowledge, and did not seem to be closely attached to an urgent need by the participants, which could have influenced why participants did not follow up the actions they planned in this workshop.

*Box 1: The two directions of actions that formed from the living lab activities and my thoughts about why only one of them was realized.*

### ***Piloting of innovation***

The collaboration in Green Parallel was an output from the processes, and I regard the piloting of this concrete idea of a local infrastructure to be a sub-activity of the agri-food living lab that again could lead to the desired sustainability outcome (Luederitz et al., 2017). The piloting demanded more detailed planning of the collective action (workshop 5), as well continuous learning and evaluative and re-planning activities (workshop 6-10) alternately with the real-life testing and adjustments, thus still having elements of co-creation. The workshops therefore contained topics and questions targeted toward strengthening Green Parallel. Granted funds enabled hiring of a paid coordinator, who did the practical work, had the weekly contact with producers, buyers, and transporter, and also contributed to recruitment of new participants, planning the workshops for all involved actors, collecting data, and being a valuable reflection partner for me. The funds also allowed the arrangement of two cooking courses for the purpose of connecting producers and buyers and increase knowledge of the utilization of locally produced vegetables.

The transportation task was conducted by a work inclusion and training entity linked to NAV, which lowered the transportation costs and at the same time contributed to meaningful training activities. The piloting lasted the seasons 2019 and 2020 and was granted funding from the County Governor's Office the first season and from the Norwegian Agricultural Agency the second season. In the second season of piloting, I was managing the external funds and strengthening of activities through the part time position at Telemark Research Institute, in addition to through the PhD position.

### ***The role of the researcher, coordinator, and participants***

The change initiative was researcher initiated, with the aim of contributing to changes in the specific situation through facilitating cycles of knowledge creation and action, as well as creating generalizable knowledge (Greenwood & Levin, 2006; Reason & Bradbury, 2008). I had an "outsider" role in the action research, with the aim of creating possibilities rather than taking any active part in conducting the changes in the region (Greenwood & Levin, 2006; Herr & Anderson, 2015).

The processes were conducted with a strong emphasis on participation and reciprocity among the participants (Herr & Anderson, 2015). The processes were

facilitated in a way that enhanced the opportunity for all participants to equally contribute and be heard and followed guidelines for fruitful dialogue-based processes (Hannevig & Parker, 2012). Furthermore, though mainly in the earliest parts, I also took on the role of connecting actors that I interpreted would benefit to connect more directly, as well as through the collective activities. The role of connecting and inviting participants was substantially diminished during the piloting, as the coordinator was appointed to this role.

The participation of actors as co-researchers varied between the different phases of the research process, as well as varying among the actors based on their actual prioritization to participate in workshops. The actors did not, however, take part in the overall design of the study, but they participated in identifying sectors and actors to involve based on the purpose of the study and the experienced obstacles of development (see paper 3). Furthermore, for most workshops, I decided the focus and questions in a flexible way, following steps in the learning and innovation processes (as outlined in Figure 3). In some workshops, however, the participants were free to choose the topics, such as in the participatory evaluation of the first season of piloting Green Parallel. In this workshop, I wanted the participants to identify issues of concern to them regarding the piloting, and these issues were subjected to explorations and dialogues between the participants.

For each workshop, the researcher or coordinator processed and summarized the dialogues, including action plans where relevant. These were sent by email to the invited actors and/or presented in the following workshop. The participants were encouraged to respond and give feedback on these by taking contact directly and/or through the facilitated dialogues in the following workshop. Such feedback was for instance facilitated after the data from the first workshop was analyzed and sorted into areas of concern for actions, then being subject to modifications after a feedback process.

Some turnover occurred among the participants, and new participants entered the workshops due to available time, which became especially prominent during the covid-19 pandemic. The turnover was also influenced by differences in perceived urgency to act regarding organic vegetables specifically, and the enrolment of new participants as the process and piloting evolved. Throughout the entire process, a handful of actors that I had closer communication with, being the most dedicated

participating farmers, buyers, and employees at the agricultural department of the County Governor's Office.

### 5.4.3.2 Methods and analysis

For most action research, I only utilized qualitative research designs (Merriam & Tisdell, 2018), as I was interested in understanding the involved people's experiences. Paper 3 and paper 4 both concern the action research initiative, which each consisted of a single case study concerning different stages in the same change and innovation process. Paper 3 concerns methodologies in the establishment phase and covers the introductory phase, as well as the co-creation of a common ground of problem understanding and shared visions (with start-interviews, workshop 1, and researcher's reflections). Paper 4 concerns the concretizing and piloting of the innovation Green Parallel (workshop 4-10, researcher's and coordinator's reflections, end-interviews). The activities and data collection between the establishment phase and the phase of planning and experimenting with the niche innovation are not covered in any of the papers (i.e., about the generation of ideas for change corresponding to identified needs of action. Figure 4 shows the data collection, and in the following, I elaborate on the methods, data collection, and analysis for paper 3 and paper 4.

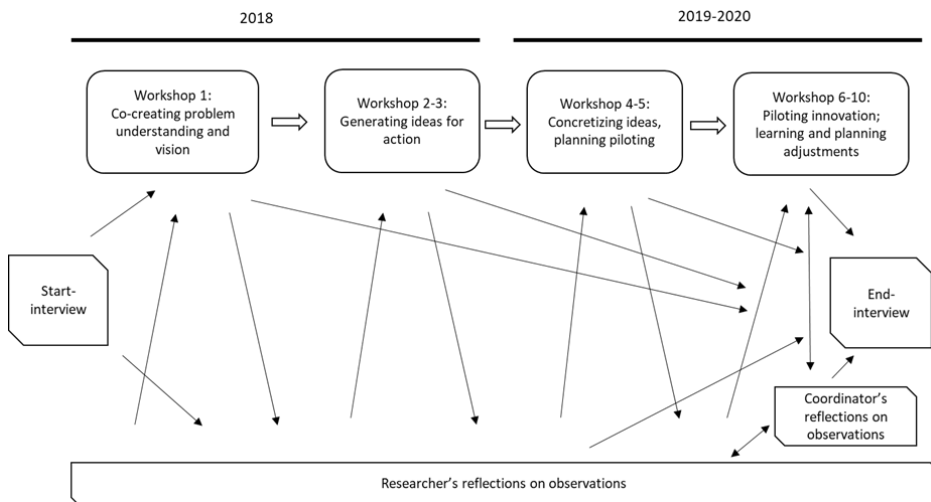


Figure 4: The processes and data collection for the action research

### ***Paper 3***

To establish the change initiative and obtain generalizable knowledge about such processes, I utilized a qualitative research design, which was an integrated part of steps described in 4.3.1 (introductory work and workshop 1). With a basic insight into the problematic situation and into potential participants from my own previous research, as well as other literature and digital resources, the following methods allowed for a gradually increasing knowledge about the situation, potential participants, and the involvement of actors: a) conversational semi-structured interviews (Greenwood & Levin, 2006), b) participatory and co-creative processes in workshop, including participant evaluation, and c) researcher's reflection on observations.

In total, 48 persons were interviewed from within and beyond the agri-food domain. The interviews concerned the entities' characteristics, existing network and collaborations, channels, and considerations about challenges and opportunities for strengthening the production and consumption of organic vegetables. I also asked whether they knew about others who could be interested in taking part in the initiative, including reflecting with them on who they thought could contribute to bypassing barriers and strengthening the development.

The interviewees were regional organic or sustainability-oriented vegetable farmers, and some organic dairy farmers, actors from the food supply chain (including change-oriented individuals within large-scale entities), food initiatives and farmers' unions. Public sector actors and the agricultural extension service were also interviewed. Interviewed actors from other sectors were within waste management, education, regional, business and tourism development, and health and welfare. As part of the interview, the reciprocity of participation was emphasized (i.e., that taking part in changes could also benefit them and the situation they were engaged in). Regarding the actors from outside the agri-food domain, the conversation also consisted of reflecting on the relevance of the initiative for them.

The "snowball sampling" method (Leventon et al., 2016) of the interviews contributed to adding potential participants to the invitation list. In total, 80 change-oriented persons within and beyond the agri-food domain were identified as potential participants and were invited to the upcoming workshop.



In the workshop, the participants were facilitated through structured dialogue processes of making a more complete understanding of the current situation as perceived by the participants and creating visions for the future situation (Pool & Parker, 2017). In total, 30 persons participated, and they came from a diversity of entities both within the agri-food domain and beyond, as well as from both the private and public sectors, and civil society and knowledge organizations. Approximately 2/3 of the workshop participants were also interviewed.

The participants' evaluations, as part of the workshop activities, and the researcher's reflections were used to support or elaborate findings from the other methods.

I conducted a basic content analysis to categorize the data from the introductory work, regarding the characteristics of the regional food system, obstacles for development, and which sectors and actors could be selected and recruited to the initiative for strengthening the initiative. For the development of a common problem understanding and a shared vision, the main data source was the participants' notes and oral presentations from the participatory processes, which was subjected to a thematic analysis (Braun & Clarke, 2006). Emergent topics for change were identified based on gaps between the current and the desired situations, which also suggested areas of action.

#### ***Paper 4***

To obtain knowledge about tensions and hindering and supporting forces of Green Parallel, I facilitated participatory processes to enhance collective knowledge development, adjustments in the piloting conduct, and continued mobilization and enrolment of change-oriented actors. I utilized qualitative research designs with the following methods to collect data about forces and tensions: a) coordinator's and participants' reflections, b) researcher's reflection on observations, and c) semi-structured interviews. The data from the workshops themselves were utilized as supportive material.

The coordinator had direct experience with the practical functioning of the scheme and the interaction between the participants, including the coordinator self and transporter. In the second season, the coordinator contributed with reflections on experiences and observations almost every week. The reflections were based on pre-formulated questions regarding activities, experiences from the weekly

ordering and transportation, interactions between the participants, and barriers, as well as potential ways to handle tensions. Participants in Green Parallel, including the coordinator and transporter, also had the opportunity to give feedback on the workshops at two occasions.

My main contact with the participants, especially the second season, was in the workshops, although I also gained insight into the conduct of Green Parallel between the workshops through dialogues with the coordinator, receiving emails, following the Facebook page and more. My reflections were based on observations and dialogues from and between workshops and focused on factors and forces that seemed to support or hinder the collaboration and viability of Green Parallel.

The interviews were conducted by the end of the piloting (i.e., the late autumn 2020) and were informed by the reflections of the coordinator and the researcher. The questions were formulated to investigate motivations to take part or not take part in Green Parallel, the sense of community, and experiences with the piloting, as well as to reflect with them regarding these experiences to identify supportive and hindering forces for the viability of Green Parallel. The interviewees included the various actors and ranged from those with little engagement in Green Parallel to those with continuous engagement. In total, 25 persons were interviewed, most of them individually, although some interviews were conducted with two interviewees at the same time.

The tensions and forces were inductively explored with the identification of themes and sub-themes from the data material. The tensions and forces were discussed and conceptualized in relation to existing knowledge and theory (i.e., mainly field theory and multi-level perspective). This included efforts to relate the findings to whether the supportive or hindering forces were external to the niche (i.e., from landscape or regime) or internal to the niche (i.e., within the group or person), thus the research had an abductive approach (Tjora, 2021).

The piloting of Green Parallel the seasons 2019 and 2020 was funded in part by the regional County Governor's agricultural department and the Norwegian Agricultural Agency, which allowed additional resources into the facilitation of the learning processes and paying a coordinator for the practical work. A report about the broader experiences from the piloting is documented in Hvitsand (2021).

#### **5.4.4 Quality of research and ethical considerations**

The quality of research can be evaluated by its rigor (Morse, 2015). Rigor is connected to the criteria of reliability and validity, including generalizability, and is applicable in both quantitative and qualitative research (Creswell & Creswell, 2018; Morse, 2015).

The *reliability* of the data is about how exact the data collection has been, and how relevant the connection between empirical material, analysis, coding, and theory is (Tjora, 2021). This is taken care of, for instance, through thorough consideration of recruitment of informants and of the utilization of quotations, as well as through choice of theory. Reliability is also connected to the possibility of replicating a study with the same results, which would be impossible in specific regarding the living lab and action research. Rather than striving for replicability, the quality of the research is assured through transparency and self-reflexivity about subjective values, biases, and inclinations, being additional quality criteria to which I have paid attention (Tjora, 2021; Tracy, 2010).

The *validity* concerns whether the data measures what they are intended to measure, and whether they are relevant for what is studied (Tjora, 2021; Yin, 2013). To cope with this, for instance, the formulation of questions to the surveys in paper 1 and paper 2 built on what emerged in interviews as well as knowledge from literature to become as targeted as possible. The utilization of different sources of data—including different types of actors as participants—and standardized methods that converge toward answering the research question, contribute to validity of the conducted research. These different sources and methods together create an understanding of the “truth” that is building against a potential researcher bias and strengthening validity (Creswell & Creswell, 2018; Levin, 2012; Yin, 2013). Prolonged engagement and observation contribute to produce rich data and to build trust with participants (Morse, 2015), which was particularly the case in the action research. Furthermore, parts of the analytical processes were done together with the participants and/or in the author teams, also aiming to reduce researcher bias (Creswell and Creswell, 2018; Levin, 2012).

*Generalizability* is about to what extent the findings apply and are relevant in a broader context (Yin, 2013). By having appropriate theoretical propositions related to the study, findings from case studies can be generalized to other situations or settings through analytical generalization. Both the individual papers and the thesis

present theoretical perspectives and existing knowledge used for the analysis of the findings and for discussion to create scientific knowledge.

Regarding the ethical aspects of the research, the overall aim of the research is to contribute to more sustainable societies for humans, animals, and nature. This ethical aspect supports that the topic of the study is worthy both when it comes to being interesting, timely, significant, and relevant, which is important also for the quality of the research (Tracy, 2010). Action research has an articulated purpose of contributing to change in specific settings desired by those involved, and at the same time, to secure rigor and scientific knowledge (Levin & Ravn, 2007). Conducting action research and an engaged researcher role requires skills, such as critical reflection, empathic understanding, an understanding of power dynamics, as well as monitoring and improvising in this landscape to produce scientific knowledge from the participatory processes. In the action research, the main pillar was to enable more voices and knowledge to come forward, build trustful relations, and this was undertaken by conscious facilitation of the dialogue so that everyone had equal speaking time in the groups and in plenary.

The purpose of the research was transparent for the informant in the studies behind paper 1 and paper 2 and participants in paper 3 and paper 4. The participants were informed about their rights, including that participation was voluntary and could be withdrawn by them. The participants signed a consent form, or they gave consent by continuing into the electronic surveys. No sensitive data were collected. The studies followed ethical guidelines for research, including reporting the research to NSD/SIKT (Norwegian Agency for Shared Services in Education and Research with reference number 877325), see Appendix. A data management plan was also developed for the study in paper 2 and the action research.

## **5.5 Findings from the individual studies**

This section shows the main findings of each paper.

### **5.5.1 Paper 1**

#### **Community Supported Agriculture (CSA) as a transformational act—distinct values and multiple Motivations among Farmers and Consumers**

When exploring why producers and members (i.e., individual consumers) engage in CSA, I found that they had distinct values and multiple motivations for engagement and that the model represents a spearhead of agri-food systems transition.

The CSA farms were small-scale organic farms and the involved farmers, growers, and core group members were opposed to the industrialized and globalized food system. Some farms were initiated by farmers and others by a group of consumers who hired a grower. For them, the CSA was an act of independence from the existing power relations in the agri-food system enabling them to create an alternative to the dominant way of producing, consuming, and distributing profit. The farmers, growers, and most consumers had a desire for agri-food systems that would safeguard aspects of environment, justice, food security and quality, transparency, health and safety, animal welfare, participation, communication, and learning. Their values were reflected in what characterizes the CSAs, as they utilize production methods in line with ideal organic farming, being a local food system with nutrient cycling, a diversity of crops and vegetable shapes, and less wastage. The members found it meaningful to participate in growing own food and it was not only the food, but also the experience and transparency, that was important for them regarding the CSA. They expressed environmental and health values and support for local farmers by providing the possibility of a decent and predictable income.

The most important motivations among consumers were to gain access to fresh local and organic food. They experienced joy and enchantment about the diversity of vegetables, their different shapes, and knowledge about how to utilize them. For producers and many of the consumers involved, the farms were an arena for converting societal values into practical actions, and they could be considered part of the do-it-yourself (DIY) trend. However, not all consumers had altruistic or political motivations for being members; some were merely interested in obtaining fresh and various products for their households. Among members, the motivations for being part of the CSA were strongest for those taking active part in activities at

the farm. Connecting with other people with similar interests and values was not a highly important motivation for being a member.

The CSAs facilitated communication around the cultivation and usage of local and seasonal produce and ensured consistency between supply and demand. Farmers, growers, and members gathered around social and educational events, as well as joint decision-making, which were appreciated activities. Still, several farmers expressed a desire for the members to be more active to strengthen the community even more to make it easier to create an understanding for securing a proper share price including all costs.

The findings suggest that sustainability and ethical values were often internalized before the engagement in CSA. For instance, we find a larger share of members having more plant-based diets than among citizens in general. Still, I found that knowledge development, values, and motivations were reinforced through the interaction between the producer and members, and among members. The CSAs frame collective learning about agriculture and sustainable livelihood by preparing fresh food and altering practices; the members state that they have increased the consumption of vegetables and they purchase more organic outside the CSA than before. Furthermore, the members expanded their collective action beyond the farm itself and collaborated in areas such as transportation and other local purchases.

The paper utilizes the concept of agroecology to illuminate the transformational potential of CSA in the meaning of being a critique of the current agri-food regime and representing a redesigned food system. This includes the contribution to shifts toward more sustainable agri-food systems, both regarding ecological, social, and economic sustainability. I found that the CSA as movement in Norway represents a spearhead within organic farming, as the farms go beyond the more industrialized forms of organic farming (with monocultures, long-travelled food, etc.) and entail redesigned agri-food systems that are organized outside the regular supply chains with its power structures and practices. Furthermore, CSA enable more sustainable consumption patterns, including eating seasonally and locally, with more vegetables, as well connecting producers and consumers and enhancing learning.

The development of the CSAs was supported by and involved a diversity of actors, such as the organic farming association and conventional farmers' unions, governmental bodies at the national, regional, and local levels, and the agricultural

extension service. The connection to different actors outside the CSA contributes to dissemination of knowledge to “mainstream” organic production as well as to conventional actors.

### **5.5.2 Paper 2**

#### **Know the farmer that feeds you: A cross-country analysis of spatial-relational proximities and the attractiveness of Community Supported Agriculture**

The study investigated the different proximity dimensions of relational (i.e., social, cognitive, institutional, and organizational) and spatial (i.e., geographical) proximities and how these influence the attractiveness of CSA to the involved owners, managers, and members. The different dimensions are interwoven in real-life. Through the multi linear regression analysis, the study finds a positive correlation between all dimensions of relational proximity and attractiveness, except for institutional and organizational proximity to external actors. These findings were supported or elaborated by descriptive analysis and qualitative descriptions.

The following five proximity variables were identified to serve as explanatory variables to the attractiveness of CSA utilized in the regression analysis: 1) Social-cognitive proximity among CSA members, 2) CSA farm’s geographic proximity to CSA members and land, 3) CSA farm’s geographic proximity to external structures and resources, 4) CSA-external social-cognitive proximity and 5) institutional proximity among CSA members. The multiple linear regression analysis found a positive correlation between variables number 1, 4 and 5 and the attractiveness of CSA, while not finding significant correlations for variables number 2 and 3. The results were robust across the countries in the regression analysis.

Social-cognitive proximity among CSA members (variable 1) was most important regarding the perceived attractiveness of CSA. This means connecting to the CSA community, including the direct contact with farmer and partake in learning activities, as well as supporting the ideas of risk sharing and securing farmer’s income. This includes interactions for building trust and exchange of knowledge. The attractiveness of CSA also increased with an interest and positive attitude toward CSA in society (variable 4). Furthermore, the regression analysis reveals a weak correlation between institutional proximity among CSA members and perceived attractiveness (variable 5), which relates to shared values and identity,

based on the difference to the dominant structures. The descriptive analysis support this by finding an attitude among those engaged in CSA that the CSA should not adapt to the dominant structures (regarding CSA-external institutional proximity). Furthermore, the study reveals that the Norwegian CSA farms had more contact with and support from external actors than CSAs in Austria and Japan (these countries have a lower organizational proximity to external actors). This support in Norway included financial support from public actors in the establishment phase, as well as networking support and advisory from organic farmers' union and the agricultural extension service.

The analysis did not find any significant correlation between geographic proximity and the attractiveness of CSA, which largely diverges from the literature. However, because the members of a CSA farm have already decided to be a member, we can assume that a self-selection process has already occurred, based on the distance and accessibility of the farm (i.e., the respondents all live fairly close to the farm). Thus, these findings could have been different had we included non-members and consumers living further away from the farm or had the questions been formulated differently to capture this proximity dimension better.

The study concludes that “increased trust, collaboration and sharing of values and knowledge within and across organizations in the food system” could increase the attractiveness of CSA.

### **5.5.3 Paper 3**

#### **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**

The developed and then applied procedure for discovering sectors and actors to include in the agri-food living lab resulted in a diversity of potential participants. Change-oriented actors within the agri-food domain represented small-scale entities who had a strong emphasis on sustainability and included organic producers and traders. A few actors belonging to the large-scale entities were not satisfied with their entities' efforts to increase the share of organic and local vegetables, but several of these reported that they had limited power to influence changes in their own organizations. Through the procedure, sectors and actors beyond the agri-food domain were also discovered, such as from waste management, education, regional,



business and tourism development, and health and welfare. These actors showed interest in exploring intersection points and collaborations, although some did not originally identify themselves closely to the topic of organic food. The focus of this initial phase of establishing the agri-food living lab was to identify actors who were motivated to contribute to overcome obstacles in the development of production and consumption of organic food and who, at the same time, could experience reciprocity of collaborating.

Through the participatory and co-creative processes in the workshop, also building on insight from the introductory work, the diversity of actors contributed a rich and holistic perspective on the current situation for agriculture and food with overlap to several other sectors. They co-created a manifold but coherent shared vision for the future, which portrayed a shift toward a more collaborative orientation. Based on the areas of concern and the corresponding vision, six emergent topics for change and action were identified: 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. These first participatory processes created actionable knowledge, laying the groundwork for future action planning as the gaps between current and desired situation were identified. Although the vision was coherent, the impression was that the different actors have different weighing regarding the necessity for the production to be organic or if “local” is sustainable per se. Both in the interviews and in the workshop processes, the main emphasis was on the challenge of local sales when it came to distribution, logistics, and lack of connections between producers and potential buyers, such as sustainability-oriented stores.

The early involvement of actors, which included reflecting with them during the interview, contributed to the change process already initiated with the first contact. Furthermore, the broad composition of participants, as well as the structured form of dialogues in the workshop, were appreciated. The paper shows how action research can be applied in a place-based living lab framework. It contributes with knowledge regarding crucial elements when establishing arenas for experimenting with new ways of co-creating knowledge, such as how to create a protective space for change-oriented actors and identify relevant sectors and actors, as well as to create a common ground for action planning.

## 5.5.4 Paper 4

### **Forces and tensions influencing the viability of a co-created Alternative Food Network in Norway**

*Green Parallel* was an output of the open innovation process, starting as described in paper 3 with the visioning of a desired future with more collaborative orientations and localized food systems that involved public canteens, restaurants, and other professional buyers. This desire motivated producers, buyers, and a work inclusion and training entity to collaborate for a logistical “solution,” named Green Parallel, and was a strong initial supportive force. However, several tensions and forces that supported or hindered the development or sustaining of the niche innovation occurred when piloting Green Parallel.

We identified five themes where tensions and contradictory forces occurred and affected the viability of Green Parallel: 1) divergence between what the farmers deliver and what buyers request; both are in need of predictability, 2) a need for more contact between producers and buyers, but who is responsible for taking the initiative?, 3) the inability of small-scale organic farmers to compete with “local food,” 4) the importance of personal engagement of the purchasers to explore and “push” the room to maneuver, and 5) the difficulty in moving from individual to collective thinking; trust and commitment are crucial elements, but the economy often decides.

The different themes are closely related to each other and interdepend, and each type of professional buyer is faced with different kinds of forces and tensions. The forces work on several levels, ranging from within each individual and within the group to the individuals being influenced by forces external to the niche innovation, displaying the complexity and messiness of change situations.

The study shows the importance of creating mutual predictability in the collaboration on several aspects, as well as securing convenience by participating. In general, the professional buyers were willing to pay a higher price for products they found to be of higher quality (fresh, seasonal, with a story, unique) compared to products through their regular channels. However, engagement and courage are demanded for change-oriented employees in regime entities to purchase through Green Parallel rather than via the convenient purchase through the existing agreements. These engaged employees and managers were empowered to change

behavior through the new infrastructure of Green Parallel, but most of them experienced disempowerment to act (e.g., in chain retail and public entities). Still, means were often available for engaged employees to purchase directly from producers.

An opposing force was that only the specialty store had truly stronger preferences for the food to be organic than to be merely locally produced, which impeded preferring products through Green Parallel above other local food. More direct contact between buyers and producers, including broader participation in the workshops, could have further enhanced knowledge and values development among the buyers and their customers about organic production and the producers' focus on soil health, diversity, nutrient circulation, and the natural nonuniformity of products. This could have contributed to preferences for organic and natural products rather than "any" local and seasonal product.

Although expressing a desire to collaborate, several participants struggled to prioritize Green Parallel and the collaboration for several reasons, due to competing commitments and many considerations to take into account. The covid-19 pandemic made the producers lack foreign labor because of closed borders, and they had to focus even more on the production, showing a weakness of dependency on global systems. For the same reason, restaurants and canteens closed or had limited purchases. At the same time, another AFN (i.e., REKO networks) emerged, and several producers found this sales channel to be more predictable for them than Green Parallel was. The realization of common production planning between producers and buyers and more formalized agreements between the producers or between the producers and buyers could potentially have strengthened the predictability and the collaboration.

Field theory contributed to conceptualizing supportive and hindering forces and tensions when experimenting with changes in a situation. The forces and tensions worked in reinforcing negative, or potentially positive, spirals that affected the individual behavior and thus the viability of Green Parallel. Applying the thinking of these forces, together with institutional economy, in a change situation into the multi-level perspective, contributed to a deeper understanding of the initiative's performance regarding both niche internal dynamics and the dynamics between the niche initiative and external forces, such as "locked in" situations – seen from the perspective of the individuals involved. Small-scale producers also reflect on the

“larger picture”—that small-scale projects, like Green Parallel, receive project funding, but the current agricultural policy leaves little room for alternatives to survive long term. Although Green Parallel did not continue in the same format, new networks and collaborations continued after the period of piloting.

## 5.6 Discussion

A systemic and holistic approach with increased participation, collaboration and collective action are regarded as crucial to address complex, uncertain, and locked-in situations in agri-food systems (UN, 2022; Thompson et al., 2007). This thesis sought to explore motivations and organizations associated with participatory and collaborative niche approaches in different contexts and with different methodologies and to discuss their potential contribution to sustainability transitions in agri-food systems. The approaches differ in the way they emerged, who is involved, and how the actors participate and collaborate: The participation and collaboration in Community Supported Agriculture (CSA) takes place at the farm level, where several engaged individual consumers participate in activities on and decisions about the (one) farm. The agri-food living lab and the emergence of the local and alternative food system named Green Parallel, by contrast, took place through a researcher-facilitated open co-creative innovation process. Here, the participation and collaboration took into account the need for cross-sectorial and whole value chain thinking (Darnhofer et al., 2012; Hebinck et al., 2021; Köhler et al., 2019) and involved a broad spectrum of change-oriented actors in collective learning and actions, also within regime entities. That the action research, in fact, lead to the creation and piloting of an alternative food network (AFN) was not a given output, but it certainly gave an extra dimension to the PhD research, such as enabling a contrast between two different models of AFN. Green Parallel, in contrast to CSA, involved several producers and professional buyers of different kinds (i.e., specialty stores, chefs in restaurants and public and private canteens, retail stores and more), which made Green Parallel a more complex and challenging collaboration.

The participation and collaboration need to be internally well functioning for the niche innovations to be viable and able to contribute to sustainability transitions by influencing the wider agri-food system. In the following, I discuss how participatory and collaborative niche approaches can be motivated and organized, as well as their potential role in sustainability transitions. After that, I reflect on methodological issues.

### **5.6.1 How participatory and collaborative niche approaches can be motivated and organized**

I found a set of issues to be core regarding how participatory and collaborative niche approaches can be motivated, organized, and sustained: motivations for recruitment, similarities in values and attitudes, active participation, and commitment to the “common project”. These issues are discussed in the following, including what is challenging in the collaborations.

#### ***Motivations for and recruitment to participation and collaboration***

Small-scale organic and diversified farms were at the core of the initiatives that this thesis concerns. This type of farm and farmers seek alternatives to the mainstream and long food supply chains and continuously need to develop their business and sales channels to enable locally based sales and secure the viability of their farms. Their ways of producing are innovative, with a strong focus on regenerative production methods and diversity in crops.

The CSA collaborations have emerged through “self-mobilization”, in line with how this type of participation is described by Pretty (1995). They consist of engaged consumers and farmers, organizing themselves to collaborate, as is often the case for AFNs as bottom-up initiatives in social movements (Lamine et al., 2012; Seyfang and Smith, 2007). According to paper 1, the consumers in CSA were motivated by getting access to fresh, seasonal, local, and sustainable produced vegetables, and by an awareness of the need for food system changes, as also found in other AFN studies (e.g., Hashem et al., 2018). Some of the CSAs had waiting lists for membership, and consumers also organized establishment of CSAs themselves (Hvitsand, 2014). This popularity shows that the consumers were sufficiently motivated to seek out the CSA themselves and that they aligned with the prerequisites of joining. They represent citizens who take an active role in shaping food systems, rather than being passive buyers or utilizing the indirect way to influence policy through the regular democratic institutions and processes (Lamine et al., 2012).

In contrast to self-mobilizing CSAs, the participants in the action research and living lab were sought out and invited to join the initiative. The participation had similarities with both “interactive participation” and “supported participation” (Caporal, 1998; Cuéllar-Padilla & Calle-Collado, 2011; Pretty, 1995), as the participation and processes was facilitated by an outside actor. Paper 3 shows the

possibility of motivating actors to join initiatives aimed at developing collaborations, despite the uncertainty about which collaborations would emerge from the participation. For selecting and recruiting participants, I developed a procedure to discover actors engaged in the topic of organic food, as well as more peripheral actors who potentially could experience mutual benefits by participating. The prospect of meeting future collaborative partners through the process motivated the participation of a diversity of actors within and beyond the agri-food domain. The research shows the possibility of also motivating actors who did not originally identify themselves with the topic of organic agriculture and food by focusing on obstacles of development that they could contribute to address and at the same time experience as positive from their own perspective. In our case, Green Parallel was co-created in the intersection between agri-food and work inclusion with the focal point around the need for local logistics of produce as a solution to direct trade and more contact between farmers and professional buyers, as well as the need for meaningful work for people who had fallen out of education and work. Here, the work and inclusion entity was motivated by the prospect of having a meaningful training area within the educational program of logistics and transportation. Professional buyers were motivated to create and utilize Green Parallel, as they had a desire to access fresh, healthy, seasonal, local, unique, and sustainable produced vegetables and ingredients “with a story”, as was also the case for CSA consumers.

### ***Values and attitudes among participants***

CSAs operate, at least in principle, outside the regular market, and paper 1 and paper 2 further elaborate previous literature regarding values and attitudes among farmers and CSA members (e.g., Galt, 2013; Henderson & Van En, 2007): They appreciate the independency from the existing power structures and cherish the collectiveness. In general, the members associate with the ideas of solidarity, sharing of risks and benefits, transparency, participation and involvement in production, social and educational events, and decision-making, and could be associated with the do-it-yourself (DIY) trend. Participants had trustful relations and, in general, shared beliefs, values, and expectations, also shown in other AFN studies (e.g., Dubois, 2018; Seyfang & Smith, 2007). The CSAs seem to entail close communities, where the farmers and the members socially interact and learn together, while also being connected to other CSAs in networks. But as with Winter (2003), paper 1 shows that being a member of an AFN is not always a political protest.

As shown in paper 3, the introductory work and the processes in the agri-food living lab, with the co-creation of a common problem understanding and a shared vision, revealed that the participants found problematic issues related to powerful actors, competitive markets, and disconnected producers and consumers. Rather, the participants wanted societies with collaborative orientations and more localized and alternative food systems. This vision made up the foundations for the co-creation of the idea of Green Parallel, which was a food system diverging radically from the mainstream long food supply chains. Thus, both the CSAs, the living lab, and Green Parallel are initiatives and niche innovations founded on alternative visions to those of the agri-food regime, which is in line with the need for exploring alternative futures to that of capitalism (Feola, 2020). The collaborations shown in the PhD research are attempts at diverging from the individually oriented market logic, as this logic is described by Vatn (2015), to a more collectively and ethically oriented direction with a joint care for the collaborative group (i.e., a *we-rationality*), and, in the wider sense, future generations and the Earth (i.e., a *they-rationality*).

However, as elaborated in paper 4, the enrolment of more diverse purchasers during the piloting of Green Parallel made the collaboration more uncertain and complex and revealed different perceptions of what is sustainable (cf. Bawden, 2012; Rigby & Cáceres, 2001; Thompson et al., 2007). A significant obstacle and hindering force (cf. Lewin in Burnes & Cooke, 2013) for the viability of Green Parallel was that most professional buyers, except the specialty stores, perceived that Norwegian food in general is sustainable, coinciding with the previous studies of consumers having a high degree of trust in Norwegian food (Kvakkestad et al., 2018; Vittersø & Tangeland, 2015). This societal and cultural perception influenced the individual behavior (Vatn, 2015) and made buyers to not clearly prefer organic food through Green Parallel above other “local food”, confirming a conflation between the scalar characteristics and sustainability outcomes (Born & Purcell, 2006; Tregear, 2011). The divergence in values and understanding about what characterizes “sustainable” or “organic” food among enrolled participants had consequences for ownership to the idea behind Green Parallel and thus to commitment and loyalty. Still, although preferences lay in local food in general, rather than additionally being organic, the involved professional buyers were on a trajectory toward increased awareness of food origins and uniqueness, loosening their requirements for uniform products, as they were searching for alternative



sources outside the mainstream. Most members of CSAs, by contrast, were, to a larger degree, aware of food and food system issues and had associated food preferences and values, including that the food to be both local and sustainable/organically produced. These findings suggest that the social and relational proximity seemed stronger within the CSAs than what we can find in the Green Parallel collaboration, in the sense of attachment to core ideas and values underlying the collaboration.

### ***The importance of active participation for learning and changes in practices***

The CSAs, living lab, and Green Parallel entailed social infrastructures with the facilitation of interactions between participants. Regarding the CSA, this consists of practical arenas for learning about ecology and farming through participating in farm work and preparing food, as well as arenas for social interaction and for planning and decision-making. This kind of participatory architecture in AFN, including transparency and communication, is important for trust and collaboration and thus continued commitment among consumers (De Bernardi et al., 2020).

The action research and innovation process in the living lab had a structured learning process with different outputs, such as the shared vision, actionable knowledge, action plans, and new networks (Luederitz et al., 2017). The structured and stepwise processes were crucial for creating ownership and finally leading to the co-created and tangible “solution” of Green Parallel that enabled the situation for improvement in the organic agri-food systems in the region. Still, the piloting showed that starting the intervention of Green Parallel was not sufficient, as the participants also had to fulfill the desire for more direct producer-purchaser contact (beyond communication through the coordinator), such as through participation in the workshops, visiting each other, and planning consumer-oriented promotions and events together.

Both paper 1 and paper 4 show a connection between the degree of participation and development of knowledge, awareness, values, motivations, and actual changes in everyday practice, coinciding with findings related to another type of AFN (Hashem et al., 2018). A stronger degree of participation could support more rational decision-making, as the purchasers would obtain more knowledge about the impact of different production methods and sales channels and encourage reflections about Green Parallel as an alternative to the dominant ways of producing and distributing. This would enable better information flow between the

participants (cf. a usual lack of information in decision-making processes; Vatn, 2015). Active participation in AFNs can indirectly lead to increased sustainability, as it affects consumers' preferred production methods and supply chain for purchases (Forssell & Lankoski, 2015). Furthermore, in paper 1, I find that the new networks also led to new collaborations among members beyond the farm itself, suggesting that those involved in collaboration experienced this approach as a purposeful one. As Lamine et al. (2012) describe, I find that networks among producers and consumers, as well as across the individual initiatives, build collective identity, community, and construction of new practices. I find that active participation is important for maintenance and reinforcement of knowledge, awareness, values, ownership, and building trustful relations and actions, but motivation and prioritization to participate in workshops, etc. requires an awareness—and a feeling of urgency to act—in the first place. An active participation seemed more difficult to encourage in Green Parallel due to the continued enrolment and the diversity of its actors, including actors who considered themselves more purely as “customers” of the producers rather than as part of a collective sustainability project.

### ***A need for coordination and predictability***

A purposeful coordination of the participation and collaboration is crucial. Paper 1 shows that the participation and learning in CSAs are coordinated by the actors themselves: the farmer, core group, and often also different sub-groups, which is also explained by the characteristics of self-mobilized participation (Pretty, 1995).

Cases with more complexity might require an actor that connects the participants, and facilitates and coordinates transition processes (Kivimaa et al., 2019). Action research could be an approach to initiate, facilitate, and coordinate locally embedded change processes with cycles of learning and acting upon sustainable development (Cuéllar-Padilla & Calle-Collado, 2011; Zuber-Skerritt, 2012). The research presented in paper 3 and paper 4 shows that participatory and co-creative process could contribute to a more holistic coordination and connect fragmented knowledge and decision-making across sectors, actor types, and value chain, which is needed (Darnhofer et al., 2012; Hebinck et al., 2021; IPES-food, 2016; Köhler et al., 2019). The facilitation of processes, and the connecting and coordination of actors, continued into the broad collaboration in Green Parallel, involving more farmers and diverse purchasing actors and transporters, which made the coordination of the practical conduct of the scheme (by coordinator), social interaction, dialogues, and decision-making (facilitated by researcher) more challenging. With this extensive

collaboration it was more difficult to effectively coordinate and at the same time caretake the intention of a more direct producer-buyer contact at the same time. This was a balance I found was practically challenging, as the actors themselves were not engaged in the coordination.

The physical infrastructures of the CSAs and Green Parallel entailed arrangements enabling direct purchase of local and organic vegetables and other organic farm products, for consumers (CSA) and for professional buyers (Green Parallel). This included arrangements of membership, ordering, and more. Both the CSAs and Green Parallel enabled participants to convert their own values into practical actions. Still, purchasing directly from producers takes more time and effort than mainstream shopping in retail or from wholesalers, especially if taking part in farm work and different events. In this regard, previous studies show that convenience and accessibility of the products are important for consumers (Galt et al., 2019; Hashem et al., 2018). The professional buyers in Green Parallel emphasized the importance of receiving sufficient information and that the ordering and delivery system had a certain level of convenience. Thus, if the professional buyers were to diverge from their existing (regime) supply chains and make use of niche supply chains (i.e., direct purchases from producers), the ordering process needs to be convenient and smooth and easier by routinizing (Vatn. 2015).

Both farmers and buyers are seeking predictability in the collaboration, as shown in paper 1 and paper 4. As the CSAs are organized with pre-payment of a share of the yield, rather than a certain *amount* of products, the production risk is shared with the members and the farmer has a predictable income. This predictability was more challenging to achieve in Green Parallel, as no formal agreements were established regarding the collaboration itself, or sales, purchases, or pre-payments. Rather, producers and buyers perceived an uncertainty regarding sales volumes for farmers, available volumes for purchase, and costs of products and transportation. One way to address this uncertainty is to do as the CSAs have done, where the producers and buyers discuss and agree on what is to be produced the following season, and the buyers purchase products based on the common crop planning. This planning could contribute to consistency between supply and demand of organic products, which is raised as a need (Milford et al., 2019), and could potentially lead to a positive spiral with increased production, purchase, and consumption. Another sustainability aspect of this common planning is that it opens up for less strict criteria regarding uniformity of the produce (Lamine et al., 2012), thereby allowing

the farmer to sell a larger share of the yields, as was experienced during the piloting of Green Parallel.

### ***Different understandings of AFN as a joint project and a collective action***

CSAs are bottom-up initiatives based on active citizen's involvement, similar to other AFNs (Lamine et al, 2012). The participants depend on each other regarding the farm work and decision-making, and a certain level of active participation is part of the membership agreement. As found in paper 1 and paper 2, the members experience (in general, not everyone) a relational proximity to the farmer and the community, and they support the idea of risk sharing and participation, seemingly acquiring a we-rationality (Vatn, 2015). Paper 1, however, revealed that the farmers experienced some challenges from varying engagement and commitment among members, as also highlighted in Galt (2013).

A we-rationality also characterized the participatory and co-creative process in the living lab, as shown from the first workshop in paper 3, likely due to the prospect of reciprocity and of contributing to increased sustainability in different aspects.

However, collective thinking was more challenging to acquire when moving into the piloting of Green Parallel as elaborated in paper 4. Joining Green Parallel involved uncertainties for the participants as they were part of an experiment and an AFN under development. The fact that the intervention of Green Parallel was co-created by the problem-owners themselves, based on urgent needs, and was in a period of trial and error suggest that the intervention should have a higher chance of being a lasting change (Schein, 1996). However, continued loyalty and commitment were challenged when the "the good intentions" were put into real-life piloting. The ownership of the idea behind Green Parallel became more diluted as new professional buyers were enrolled into the collaboration and the entanglement of the niche activity with regime practices was put into test. Among the professional buyers, only specialty stores were close to seeing Green Parallel as a joint project rather than considering themselves as "customers" of the farmers in a more traditional (marked logic) way. This perception seemed to prevent their motivation to participate in the workshops where the dialogue and collective learning took place. A more active participation in workshops could potentially have strengthened the ownership to Green Parallel and the values associated with collectiveness and sustainability. As shown, the collaboration in Green Parallel was complex and challenging due to the diversity of actors both within and beyond the agri-food

domain, which is not an unknown problem in this kind of collaborations (Lamine et al., 2012).

Even though they participated in the co-creation and collective decision-making, also farmers had difficulties to commit to the common project of Green Parallel. Their economic margins are small and with close ties between the economy and situation of the farm and family. The farmers are used to individual decision-making and are flexible regarding their allocation of labor and which sales channels they utilize, and several of them found the emerging REKO networks (Hvitsand & Leikvoll, 2023) as a more attractive model. The farmers search predictability in income and costs, as well as a short-term livable day to day income, which in practice limits their willingness or ability to act upon a we-rationality (Vatn. 2015). However, not being loyal to the collective project of Green Parallel, lead to inner loyalty conflicts among some of the producers.

The piloting showed the importance that all involved commit to build trustful relationships and follow up on agreed-on tasks with a sense of accountability, as well as secure an understanding of the collectiveness of the collaboration among all involved. Green Parallel suffered from too little and scattered commitment from those involved, even though assumingly all would have benefitted if everyone was fully committed to tasks and more extensively utilizing it for sales and purchase. This shows that the willingness to collaborate was conditional and dependent on the actions of others (Vatn, 2015). Thus, Green Parallel is an AFN suffering from “tragedy of the commons”, which is discussed in relation to AFN in De Bernardi et al (2020). The structures in Green Parallel did not entail mechanisms for sanctioning or correcting those not contributing, although such mechanisms could strengthen collective action (Ostrom, 2000). Introducing sanctions in this kind of collaboration might have been risky, but more formalized agreements and structures between producers, buyers, transporter, and coordinator, and between producers could have strengthened the collaboration, cf. highlighted in Rossi (2017).

For both CSA and for Green Parallel the structures of the AFN entailed a change, even though not all involved individuals or employees associated with the thinking of radical food system changes. As highlighted by Tregear (2011), individuals within an AFN do not necessarily identify with core ideas of the AFN, but the piloting of Green Parallel clarified a need for a “critical mass” of participants connecting to a common ground of visions, expectations, and collective thinking based on

similarities in worldviews and values. I find fewer tensions in the CSAs than in Green Parallel, but this was not specifically studied in the CSA papers.

### **5.6.2 The niche innovations' potential contribution to sustainability transitions**

In the following, I discuss the potential contribution of participatory and collaborative approaches of niche innovations to sustainability transitions, in terms of being spearheads for sustainable farming and consumption, interacting with regime structures, and the potential effect of connecting bottom-up processes of AFN with top-down processes. The discussion also entails some of the external challenges niche collaborations can meet.

#### ***Spearheads upon more sustainable farming and consumption***

The farmers within CSA and Green Parallel are spearheads for sustainable farming upon both conventional and the more industrial forms of organic farming, with practices and organizations being radically different from “mainstream.” The farms go beyond the minimum requirements in organic farming and can be characterized as agroecological “market gardens” focusing on diversity, circularity, soil health, and carbon binding. Both well-known and new varieties of plants suitable for growth under the local conditions are produced. The farmers work in close collaboration with the agricultural extension services in research activities for developing agronomic knowledge of regenerative production practices. The interaction between these farmers and the extension service can contribute to incremental changes in the extension and diffuse into the contact with other (organic) vegetable farms, including those more industrially oriented. This could be a significant change process, as the agricultural extension service is associated with being part of the advisory and research system that contributes to the locked in situation in the current agri-food regime (Lamine et al., 2012).

Furthermore, CSA farmers are in front when it comes to reaching out to citizens and re-connecting them to agriculture, which is regarded as important for raising awareness about agri-food sustainability issues. The CSA model provides arenas where consumers can participate and collaborate in alternative ways of consuming, while also providing educational arenas for the wider public. In paper 1, I found that being a member of a CSA enhanced local, organic, seasonal, plant-based, and diverse diets, as well as the utilization of nonuniform plants and more of each plant, which is postulated to represent a more sustainable consumption (Darnhofer, 2014; Muller

et al., 2017). Farmers and consumers are expanding their knowledge about growing and cooking with indigenous and new plant varieties that can thrive in our climate, which in turn can influence food practices and culture, while putting pressure on the landscape (Geels, 2011). In Norway, REKO networks are also part of spearhead production and consumption when it comes to enhancing the connection between producers and consumers oriented toward sustainable and organic food (Hvitsand & Leikvoll, 2023). Both CSAs and REKO networks are self-organized initiatives within widespread niches that serve as “alternatives” to the mainstream ways of producing and consuming.

Several of the farmers and consumers associated with CSAs, REKOs, or other direct sale channels are active societal voices for sustainability shifts and are visible in social media and other arenas. These initiatives and voices have the capacity to influence public opinion (Lamine et al., 2012). Increased demand through AFNs stimulates the recruitment of more “market gardens,” organic farming, and more direct sales channels in Norway, as found in paper 1 and by Hvitsand and Leikvoll (2023). As long as the participants’ motivation and commitment continue, these could encourage a positive development spiral of a change processes, as these alternatives could stimulate further mobilization locally (Lamine et al., 2012). At the same time, the desire to grow and to utilize specific types of plants is influenced by food culture trends, which is part of the landscape within which regime and niches operate (Geels, 2011). These models of AFN spread through replication to more places, through processes called stretch and transform according to the multi-level perspective (Smith and Raven, 2012).

The studied professional buyers in paper 4 are also spearheads when it comes to diverging from the dominant ways of purchasing (i.e., the societal norm of mainstream purchasing) and are reasoned on alternatives to habituated and routinized action, although more time consuming (Vatn, 2015). Several purchasers pushed their room to maneuver, diverging from the within the frames they legally had in their entities. They showed the possibility of changing routines and purchasing locally, directly from producers, and that, with local adjustments, the idea behind Green Parallel could be realized in other places and other entities. The experiences from the emergence of the AFN through the co-creative processes and the cross-sectorial approach of connecting to the health and welfare sector in the conduct of Green Parallel could also be replicated in other locally embedded sustainability initiatives.

### ***Interaction between niche innovation and regime structures***

Both the CSAs and Green Parallel represent redesigned agri-food systems that entail radical niche innovations and re-shaping of power relations (Méndez et al., 2013), as sub-systems within the larger agri-food system. The power and control of the value chain are dispersed rather than concentrated among the few dominant agri-food actors. The CSAs represents quite closed agri-food systems, with a low degree of interaction with regime structures, as each CSA has its own economic system. Still, CSAs draw on regime structures, such as the national production subsidies (which are higher for organic than conventional farming per acre) and regional development funds. In addition, in the last few years, a temporary national program, Innovation Norway, has applicable funds related to costs of establishing market gardens (most CSAs have market garden characteristics). Thus, in addition to widespread collaboration with the agricultural extension service, other organizations and governmental programs also are creating enabling frames through their resources and thus indirectly contributing to spread models of self-mobilized initiatives (Pretty, 1995).

The CSAs, the living lab, and Green Parallel consist of protective spaces where visions, ideas, and collective thinking and action could develop. In these spaces, the initiatives could be shielded from power imbalances and be nurtured though such as start-up financial resources and other resources (Smith & Raven, 2012). The agri-food living lab and Green Parallel had, by design, more contact with external environments and searched to connect different societal challenges and opportunities embedded in the local context. They were more open and complex, with the inclusion of diverse sectors and actors, including change-oriented actors from regime entities, such as extension, public entities, entities in the value chain, etc. Professional buyers were empowered to purchase alternatively by the new infrastructure that Green Parallel entailed. They could legally purchase from Green Parallel producers, as for example the public entities had an opening for purchasing 20 percent outside the regular purchasing arrangements. However, several of the potential and actual participants were individual employees in a situation where their intention and desire to purchase were constrained by locked in structures in their own entity. This created difficulties for the change-oriented employees in public canteens and chain retail stores, for instance, to commit to Green Parallel and was one of the struggles Green Parallel met. This hybrid initiative, where regime employees engage in niche activities, challenged dominant values and behavioral



norms, created tensions, and thus put pressure on the regime, also posed in the literature (Lamine et al., 2012).

The professional buyers are used to operating in a market with competition and tenders, but change-oriented employees were motivated to diverge from routinized behavior to receive seasonal, local, and unique products, showing the changes in rationalities and behavior needed for shifting toward a sustainable development (Vatn, 2015). Paper 4 shows that the desire and attempts to diversify in routines and practices can also come from inside regime entities, contributing to a more pluralized depiction of regime actors (Turnheim and Sovacool, 2020). However, this demands personal engagement and courage to explore alternative behaviors, as most purchasers experienced disempowerment to act. The main difficulty seems to lie with an organizational opposition to diverge from routinized and habituated purchasing, also added administrative work and from uncertainties about the legality of purchasing from other than the wholesalers and tender agreements, being a strong hindering force occurring in entities, cf. Lewin's field theory (Burnes & Cooke, 2013).

Other difficulties also arose related to the lock-ins to the current regime, which need to be addressed beyond the single collaboration. For instance, in the case of a chain retail in Green Parallel, the main difficulty in selling was a prevailing attitude and expectation among customers toward standardized vegetables and prices in the store. This illustrates the need to work for increased awareness in public opinion, opposing the retail chains' current marketing, which is mainly focusing on price and quantity. This is a complex process, and my research supports that "widespread changes in food practices demand significant changes in important arenas such as food culture, knowledge and technological systems, regulatory and institutional frameworks, territorial planning, etc." (Lamine et al., 2012, p. 246). Individual and collective action could contribute to changing values and societal norms about how to purchase sustainably (Leach et al., 1999; Vatn, 2015) and opening the opportunity for the niche to disturb and change regime practices. This suggests the need to focus both on transforming regime structures, such as the criteria of standardization, and on consumerist cultures, competition, and the concentration of power (Feola, 2020), which are present in the food market (NOU 2011: 4). However, the situation did not fall back to the "quasi-stationary equilibrium," with maintenance of the behavior before Green Parallel was piloted, as is often the case in Lewin's field theory (Burnes & Cooke, 2013; Schein, 1996); instead, the created

networks, practices, and experiences have shifted the situation forward (as in the epilogue in paper 4).

### ***Connecting top-down governmental policy with bottom-up initiatives***

At the level of a community, locally embedded living labs can function as platforms for mobilizing actors and creating ideas for activities and innovations to enhance sustainability (Bulkeley et al., 2016; Hvitsand & Richards, 2017). These governance structures can frame the coordination and strengthening of different initiatives, including connecting to other “systems” (Lamine et al., 2012), such as waste management and recycling of nutrients and regional development based in agri-tourism, as shown in paper 3. The researcher-initiated living lab facilitated “interactive” and “supported” participation (Caporal, 1998; Cuéllar-Padilla & Calle-Collado, 2011; Pretty, 1995), laying the groundwork for ideas and activities to emerge through co-creative processes. The initiative was a top-down process of participation that had a pre-decided direction based on expert-knowledge of what sustainable agri-food systems entail (IPES-food, 2016; McIntyre et al., 2009; Thompson et al., 2007; UN, 2022). In this context, Green Parallel emerged as a bottom-up initiative among those being aware of the need for more radical changes in line with the worldview of “diversified agroecological systems” (IPES-food, 2016) diverging from the more industrial and globalized agri-food systems. This is an example of how a top-down process can facilitate bottom-up activities and innovations.

At a national level, a political goal is to increase the production and consumption of organic food with as much as possible of the demand covered by domestic production (Ministry of Agriculture and Food, 2018). According to the Norwegian authorities, one way of achieving this is to also utilize sales channels other than retail chains (Norwegian Agricultural Agency, 2019b). Niche innovations, such as CSAs, REKO networks, Green Parallel, and other direct sales channels for sustainable food are contributing toward reaching these policy goals. The model of CSA, for instance, has been viewed as interesting by a diversity of Norwegian regime actors, such as local, regional, and national governments and farmers unions, because of its potential to set focus on conserving urban or urban-close farmland, connecting consumers to agriculture etc., and enhancing a diet with more fresh vegetables (Hvitsand, 2014). Although CSA is “ideal” in these aspects, it is merely a curiosity that is caretaking some appreciated aspects, while the dominant agri-food

structures and the concentration of economic and political power are preventing wider changes (IPES-food, 2016; NOU 2011: 4).

Still, a window of opportunity seems to be opening for more sustainable production based on the increased consciousness and awareness about local and sustainable food (i.e., pressure from landscape; Geels, 2011). In Norway, new businesses, such as market gardens selling through CSA, REKO, and specialty stores, have been established based on the increased demand (paper 1, paper 4, Hvitsand and Leikvoll, 2023). Interestingly, the small-scale farmers in Green Parallel highlighted a need for more producers of organic vegetables, as well as large-scale ones, in cases of increased demand from professional buyers. Thus, to stimulate more sustainable production and consumption, the public sector could utilize its purchasing power to demand locally produced organic products through top-down processes of policy (Lamine et al., 2012; Lindström et al., 2020). As shown in paper 4, an opening already exists for this today, but only the most personally engaged and courageous employees in regime entities push their room to maneuver and conduct these purchases. However, national policies of purchasing organic foods in Sweden resulted in increased domestic production (Lindström et al., 2020), showing the need for favorable policies.

Changes in public opinion, combined with top-down policies and bottom-up initiatives of AFNs, are likely to be processes that can reinforce each other and trigger wider processes of change. This could involve public-private partnerships in more formalized forms and could be included, for instance, in crop planning (Lamine et al., 2012).

### **5.6.3 Methodological reflections**

In the following, I discuss methodological issues related to my research positioning, research designs, and quality of research, and reflect on action research issues in specific.

#### ***Personal positioning***

Value-neutral research is hard to achieve, pointing to the importance of explicitly stating one's own ethical values and epistemological assumptions (Schneider et al., 2019). The way I have described and framed challenges and sustainable development paths in agri-food systems, as well as identification of research questions and choice of theory and methodology, reveal my perspectives and

worldviews. To enhance transparency about my positioning in this regard, I have added a section about my background and research interests (section 5.1.3). If I believed in a pure top-down decision structure and management and a continued growth in productivity and specialization with use of chemical input as the way to increased sustainability, I most likely would have taken a different research direction than the chosen one and framed the research completely differently. The research takes a critical approach to understand why sustainable development is not widely taking place despite knowledge about the unsustainability of the prevailing agri-food systems.

### ***Research design and quality of research***

I took a pragmatic approach to the design of the research, utilizing a breadth of methods to gain insight in the topic of the thesis and papers. The PhD research spanned quantitative to qualitative research designs, including action research (Creswell & Creswell, 2018; Merriam & Tisdell, 2018). This involved the utilization of multiple methods and sources of data for a rich exploration of participatory and collaborative niche approaches in different contexts. The quantitative methods enabled me to achieve insight into values and motivations among a large number of producers and consumers involved in CSA, as well as casual relationships between different proximity dimensions and perceived attractiveness of CSA. Still, these studies were limited by the categories of statements that were provided, and further explorations were dependent on the respondents' elaborations in open questions. The qualitative methods allowed for a deeper understanding of peoples' experiences and perceptions on values, motivations, views on the collaborations, etc. A vulnerability of qualitative research is the subjective nature of the data and the interpretations during the analysis (cf. Morse, 2015). Measures were taken to strengthen validity: I utilized several and standardized methods that complemented each other when corroborating the results. The findings were discussed by the author teams and with the participants in the action research, and in addition I was aware and transparent about researcher biases (Levin, 2012; Morse, 2015; Tjora, 2021; Yin, 2013). Still, the tight connection between me and the actors, mainly in the action research, could have influenced the research. For instance, I knew several of the actors invited to the living lab from before, and this could have made it harder for some not to participate or to be completely honest, such as regarding desired degree of commitment for fear of disappointing me.

Regarding replicability, obtaining a similar result will be impossible if, for instance, a living lab is facilitated in another setting with other participants and local contexts. I have been transparent about the purpose of the studies, recruitment of participants, data collection, analysis, and other parts of the research process, and thus the procedures could be repeated with contextual adjustments. In action research, the processes and data are closely connected to specific contexts and societal challenges; thus, a need is raised to be conscious about the balance between relevance for those involved in the actual setting and the creation of knowledge to the scientific community (Levin & Ravn, 2007). This potential bias, as is prominent in case study research, was handled by framing the research and discussing findings in relation to existing theories and previous studies, enabling creation of generalized knowledge (Yin, 2013).

### ***Bounding, inviting to, and facilitating the action research***

In paper 3, I created a system of interest (Ison, 2017) with the specific purpose of strengthening organic vegetable agri-food systems, functioning as a protective space for change-oriented actors (Smith & Raven, 2012) and aiming for empowerment and emancipation of these (Kemmis et al., 2014). I wanted to explore opportunities for collaborations across sectors, actors, and value chain, and thus I developed and applied method of identifying, selecting, and recruiting participants within and beyond the agri-food domain, which I found to function well. The way I approached the interviewees as potential participants to the change initiative was successful regarding communicating the mutual benefits by participating. This also created a motivation in those not initially identifying themselves with organic vegetables, although not persuading them if unwilling. Due to the open process format, the actors were invited to a change process rather than a concrete “solution” they could take part in. The collaboration with the County Governor’s agricultural department and my already existing relationship with several interviewees in the region, seemed to secure legitimacy for the initiative and an easy access to the field.

I assume that the “interactive” and “supported” participation (Caporal, 1998; Cuéllar-Padilla & Calle-Collado, 2011; Pretty, 1995) in the living lab would not have emerged by itself, due to the diversity of actors partly being unknown to each other. Although the initiative was facilitated, the participants, with their different knowledge and perspectives, took part in co-creative processes and analysis, developed action plans, and were responsible for making decisions related to which innovation to realize, which adjustments to make, etc. I experienced a need to be

flexible in the conduct of the processes due to their evolving natures (Greenwood & Levin, 2006); for instance, I needed more workshops than expected for the participants to identify and concretize collaboration to realize. The direction that the process took, with the focus on local food systems, led to more specific actors being enrolled to participate and specific questions to be asked in workshops according to emerging experiences and learning from the piloting—questions and experiences that would have been completely different with another activity realized.

The living lab expanded the participants' network, which they could utilize in other occasions. Despite all that was conducted during the action research, there is also a recognition that more could have been done with more resources (time, personnel, finances). For instance, several more ideas of actions to improve the situation emerged during the idea generation step, and thus the potential for collaborations and innovations was larger than the PhD research could capture and facilitate, as these needed more “birth help” to materialize. In this regard, I found that the concept of co-creation functioned very well as a development method (Andersen et al., 2018), such as in the context of thinking openly and creatively about alternative futures (Feola, 2020) and about ideas to reach the desired future. However, when it comes to piloting ideas and to collectively act, there is a need for more than processual support, but also financial resources and long-term commitment. More active participation in the Green Parallel workshops could have created more awareness, stronger ownership, and development of sustainability values, and thus a stronger commitment to the collective project (Darnhofer et al., 2012; Greenwood & Levin, 2006; Luederitz et al., 2017). The fact that the collaboration was facilitated by an external actor and did not emerge in a self-organized way might have influenced the commitment, even though embedded in their own visions and needs. Experiencing the different levels of attachment to the idea of Green Parallel was frustrating without the resources or capacity to work harder for addressing the need for increased awareness.

I experienced that reality changes continuously and fast, such as when the direct sales channel of REKO networks and the covid-19 pandemic emerged, both radically changing the prerequisites for Green Parallel. For this reason, the ideal process, with more time and resources, would be to go back to the very start of the living lab processes to explore other obstacles and solutions and develop adjusted visions. The systems thinking enabled me to understand the connection between what was

happening in real life (hard systems) and the “change systems” of the living lab and piloting of innovation (soft systems), cf. Bawden (1991). Cycles of critical reflection and action took place in the action research although theories of such cycles are not described in detail in the thesis or papers, such as by utilizing Kolb’s experiential learning theory, as theorizing this part has not been a focus of the research.

Although I am taking an “outsider” role in the action research, I could somehow be considered a stakeholder in agri-food systems changes and an “insider” in the action research due to my personal interest in vegetables and organic and local food, and my desire for the initiative to be successful. Although not living in the geographical center where I conducted the action research, I am still part of the alternative “community” that desires food system changes. This influenced the effort I put into the changes, including the fact that I coordinated Green Parallel in the very first weeks until a proper coordinator was in place. However, in the process of analyzing data, I perceive that I have managed to take a critical approach to the change process and the actors’ contribution or lack of contribution to the process and to the practical changes. By taking a reflective and analytical distance to the field, I aimed to also contribute to scientific knowledge from the action research (Levin & Ravn, 2007).

## 5.7 Conclusion

### 5.7.1 Main contribution of research

The research contributes to increased knowledge about how participatory and collaborative niche approaches that represent niche initiatives and innovations can be motivated and organized, and how they could contribute to sustainability transitions by “unlocking” the entrenched current agri-food situation. The research is focusing on the change itself, and with its whole-system approach, it contributes to increased understanding about how to connect actors across the value chain and sectorial divisions, as well as about the coordination of activities that enhance sustainable development paths through organic production and local food systems. This knowledge is crucial for operationalizing the cross-cutting UN sustainability goals and to establish purposeful partnerships and collaborations at the local level.

The research finds that the success of the collaboration depends on issues and forces both within the collaborative group itself and the relation to the external environment in which the participants operate. To be motivated to participate and collaborate, the participants need a certain degree of awareness about sustainability and perceived urgency to act, shared visions and values, trust, and the willingness to commit to a common “project” with a long-term perspective. The participants depend on each other for the niche innovation and collaboration to succeed, and the AFN collaborations necessitate the acquisition of a *we-rationality* with the participants being concerned about what is appropriate to do for the group. The research provides insight into the actors’ assumptions, beliefs, values, and emotions, which is regarded important for understanding change processes and the willingness and motivation to collaborate. Taking an active part in learning and social activities in AFNs contributes to reinforce motivations, values, trust, knowledge development, and sustainable practices in a broad sense—and the same factors are unchanged or reinforced in a negative direction if participants do not take an active part or have bad experiences. Appropriate coordination of activities and decision-making processes are crucial in this regard.

The research shows how action research, framed as a place-based living lab with broad participation, can be established and facilitate an innovation process. The longitudinal action research showed the possibility of co-creating knowledge and actions and moving along the entire innovation process; from identifying a common problem to understanding, visioning, generating ideas, and piloting a desired and



feasible innovation. The piloting of Green Parallel unfolded the complexity and occurring tensions when the farmers searched for predictability and change-oriented professional buyers tried to diverge from the existing mainstream and long supply chain of purchases. This contributes to a more pluralized depiction of regime actors and their challenges when individuals engage in niche activities. Furthermore, the action research illuminates how motivation can change over time due to forces that are both internal and external to the niche activities and ones' own direct influence.

CSAs, REKO networks, and initiatives like Green Parallel create opportunities for new practices and can gradually enhance wider transition processes through changes in the dominant rules, routines, norms, and beliefs among individual consumers and professional buyers. These initiatives can inspire changes in food culture and trends and put pressure toward sustainability transitions in agri-food systems. This will entail more sustainable production methods, more direct contact between value chain actors, more dispersion of power and profit through shorter food supply chains, and more sustainable consumption (i.e., by increasing the availability of short-travelled, organic, unprocessed, and plant-based food).

I suggest three main theoretical contributions from the research:

***1. The connection of action research and place-based living labs (Urban Living Labs) for facilitating change***

Action research and urban living labs are approaches for facilitating improvement and innovation but are mostly utilized in different contexts. I framed the action research as an agri-food living lab due to the need for more cross-sectoral and multi-actor participation and the functioning of living labs as innovation platforms (argued for in paper 3). Thus, the study contributed to the development of methodologies for facilitating and analyzing change processes based on soft and critical systems thinking, and to a pluralization of theories and methodologies, as encouraged by Midgley (2000).

***2. Methodology of establishment of a cross-sectorial and multi-actor change initiative***

The procedure for discovering sectors and actors to take part in the living lab, as developed in paper 3, can be applied to other settings in need of change and improvement. It was developed to think more broadly when considering who could

contribute to the desired development direction. Thus, the starting point was to find out what were perceived as obstacles of development and who could contribute to address them. The procedure enables the discovery of connections with different sectors and actors that could be helpful for addressing and “solving” challenges and spotting opportunities.

### ***3. The connection of multi-level perspective, field theory, and institutional economy to understand tensions at the individual level***

The utilization of elements from field theory and institutional economy contributed to analyze and understand occurring forces and tensions, as well as decisions made by individual participants in niche activities in a multi-level perspective. The connection of these theories to illuminate participatory and collaborative approaches for sustainability transition can help in understanding why initiatives or innovations (interventions) can enter upward or downward spirals of development, as conceptualized in paper 4, based on systems thinking.

### **5.7.2 Implications for practice, policy, and further research**

Participation in change initiatives can empower participants as new networks and options for alternative behavior occur. The studied AFNs entail characteristics of more sustainable agri-food systems, and the ideas behind these initiatives can be replicated to more places and realized in locally adjusted formats for increased impact on sustainability. To stimulate more sustainable production and local food systems, the public sector can utilize its purchasing power through appropriate political strategies, guidelines, regulations, and other policy instruments. Despite international regulations regarding public purchase, entities have openings to additionally purchase locally outside the agreements. To enable this, change-oriented employees need to have more room to maneuver to purchase and to be frontrunners for wider change processes rather than experiencing disempowerment. Collaborations with local farmers could develop into local public-private partnership. More cases and research are needed to obtain knowledge about how these kinds of collaborations can be encouraged, coordinated, and organized.

Place-based living labs are just starting to appear within the broader agri-food domain. Agri-food living labs can be established as platforms for the co-creation of knowledge and ideas of sustainability innovations embedded in local contexts. Place-based living labs (e.g., facilitated through action research or by local governments or organizations) entail governance structures that can strengthen the

involvement of change-oriented citizens (such as inhabitants, employees, entrepreneurs etc.) in sustainability transition processes, enabling the connection to policy and planning. Furthermore, these living lab arenas can enable the integration of agri-food with other sectors and initiatives and the connection of different actors in the food supply chain to develop sustainable local food systems, thereby encouraging more research that follows and facilitates living labs.

However, initiatives and innovations are vulnerable after the first period of enthusiasm and support, for example in the form of project financing or process facilitation capacity. Collaboration is more time consuming than acting individually, and some control is lost, but the outputs are potentially greater. Thus, more knowledge is needed about how to achieve a we-rationality in complex agri-food collaborations, as this could enhance lasting action and collectiveness, and how to secure positive outcome for the participants. Future research could focus on structures and incentives that would encourage participation and lasting changes. Such research could focus on alternative structures to the current arrangements of project organization and temporary grants to niche activities and projects. Related to this is a need for research that addresses the prerequisite of capitalism on sustainability transitions, and what could be done to counterweight the logic of the market, individual thinking, and other aspects of capitalism. Critical action research could, to a larger degree, be applied in sustainability transition research, such as within agri-food systems, due to its focus on challenging power relations and structures.

## 6 References

- Ackoff, R. L. (1974). *Redesigning the future: A system approach to societal problems*. John Wiley.
- Andersen, L. L., Espersen, H. H., Kobro, L. U., Kristensen, K., Skar, C., & Iversen, H. (2018). Demokratisk innovasjon: Teorier og modeller for samskapende sosial innovasjon i norske kommuner. USN.
- Armson, R. (2011). *Growing wings on the way: systems thinking for messy situations*. Triarchy Press Limited.
- Audet, R., Lefèvre, S., Brisebois, É., & El-Jed, M. (2017). Structuring tensions and key relations of montreal seasonal food markets in the sustainability transition of the agri-food sector. *Sustainability*, 9(3), 320.
- Avelino, F. (2017). Power in sustainability transitions: Analysing power and (dis)empowerment in transformative change towards sustainability. *Environmental Policy and Governance*, 27(6), 505-520.
- Bawden, R. (1991). Towards action research systems. In O. Zuber-Skerritt (Ed.), *Action Research for Change and Development*. Routledge.
- Bawden, R. (2012). How should we farm? The ethical dimension of farming systems. In *Farming Systems Research into the 21st century: The new dynamic* (pp. 119-139). Springer.
- Bawden, R. J. (1996). On the systems dimension in FSR. *Journal of Farming Systems Research and Development*, 5, 2-18.
- Bell, K. (2013). *Social movement*. In *Open Education Sociology Dictionary*.  
<https://sociologydictionary.org/social-movement/>. Retrieved January 20<sup>th</sup> 2023.
- Born, B., & Purcell, M. (2006). Avoiding the local trap: Scale and food systems in planning research. *Journal of planning education and research*, 26(2), 195-207.
- Bradbury, H. (2015). Introduction: How to situate and define action research. *The SAGE handbook of action research*, 1-12.
- Bratberg, E. (2022). *Agricultural Cooperatives (in Norwegian)*.  
<https://snl.no/landbruksamvirke>. Retrieved December 21<sup>th</sup>.2022.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Bugge, A. B. (2015). Moralities of food and meals – how to eat properly (in Norwegian). Report no. 3. SIFO
- Bui, S., Cardona, A., Lamine, C., & Cerf, M. (2016). Sustainability transitions: Insights on processes of niche-regime interaction and regime reconfiguration in agri-food systems. *Journal of rural studies*, 48, 92-103.
- Bulkeley, H., Coenen, L., Frantzeskaki, N., Hartmann, C., Kronsell, A., Mai, L., Marvin, S., McCormick, K., van Steenbergen, F., & Palgan, Y. V. (2016). Urban living labs: governing urban sustainability transitions. *Current Opinion in Environmental Sustainability*, 22, 13-17.

- Burnes, B., & Cooke, B. (2013). Kurt Lewin's Field Theory: a review and re-evaluation. *International journal of management reviews*, 15(4), 408-425.
- Caporal, F. (1998). La extensión agraria del sector público ante los desafíos del desarrollo sostenible: el caso de Rio Grande do Sul, Brasil. Doctoral thesis, not available.
- Checkland, P., & Poulter, J. (2006). *Learning for action: a short definitive account of soft systems methodology and its use, for practitioners, teachers and students*. John Wiley and Sons Ltd.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative & mixed methods approaches* (Vol. 5th edition). Sage.
- Cuéllar-Padilla, M., & Calle-Collado, Á. (2011). Can we find solutions with people? Participatory action research with small organic producers in Andalusia. *Journal of Rural Studies*, 27(4), 372-383.
- Darnhofer, I. (2014). Contributing to a transition to sustainability of agri-food systems: Potentials and pitfalls for organic farming. In S. Bellon & S. Penvern (Eds.), *Organic farming, prototype for sustainable agricultures* (pp. 439-452). Springer.
- Darnhofer, I., Gibbon, D., & Dedieu, B. (2012). Farming systems research: an approach to inquiry. In *Farming systems research into the 21st century: The new dynamic* (pp. 3-31). Springer.
- De Bernardi, P., Bertello, A., Venuti, F., & Foscolo, E. (2020). How to avoid the tragedy of alternative food networks (AFNs)? The impact of social capital and transparency on AFN performance. *British Food Journal*, 122(7), 2171-2186.
- Dubois, A. (2018). Nurturing proximities in an emerging food landscape. *Journal of Rural Studies*, 57, 1-12.
- Egmore, J. (2016). *Action research for sustainability: Social imagination between citizens and scientists*. Routledge.
- El Bilali, H. (2019). The multi-level perspective in research on sustainability transitions in agriculture and food systems: A systematic review. *Agriculture*, 9(4), 74.
- Elzen, B., Barbier, M., Cerf, M., & Grin, J. (2012). Stimulating transitions towards sustainable farming systems. In *Farming Systems Research into the 21st century: The new dynamic* (pp. 431-455). Springer.
- Elzen, B., Geels, F. W., & Green, K. (2004). *System innovation and the transition to sustainability: theory, evidence and policy*. Edward Elgar Publishing.
- Ericksen, P. J. (2008). Conceptualizing food systems for global environmental change research. *Global Environmental Change*, 18(1), 234-245.
- European Commission (2020). Farm to Fork Strategy. For a fair, healthy and environmentally-friendly food system.
- European Environmental Agency. (2017). Food in a green light. A systems approach to sustainable food.
- FAO (2002). Organic agriculture, environment and food security. *Environment and Natural Resources Series No. 4*.
- Feenstra, G. W. (1997). Local food systems and sustainable communities. *American journal of alternative agriculture*, 12(1), 28-36.
- Feola, G. (2020). Capitalism in sustainability transitions research: Time for a critical turn? *Environmental Innovation and Societal Transitions*, 35, 241-250.

- Forssell, S., & Lankoski, L. (2015). The sustainability promise of alternative food networks: an examination through “alternative” characteristics. *Agriculture and human values*, 32(1), 63-75.
- Galt, R. (2013). The moral economy is a double-edged sword: explaining farmers’ earnings and self-exploitation in community-supported agriculture. *Economic Geography*, 89(4), 341-365.
- Galt, R. E., Bradley, K., Christensen, L. O., & Munden-Dixon, K. (2019). The (un) making of “CSA people”: Member retention and the customization paradox in Community Supported Agriculture (CSA) in California. *Journal of Rural Studies*, 65, 172-185.
- Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, 1(1), 24-40.
- George, A. L., Bennett, A., Lynn-Jones, S. M., & Miller, S. E. (2005). *Case studies and theory development in the social sciences*. MIT Press.
- Gliessman, S. R. (2014). *Agroecology: the ecology of sustainable food systems*. CRC press.
- Greenwood, D. J., & Levin, M. (2006). *Introduction to action research: Social research for social change*. SAGE publications.
- Grøntutvalget. (2020). The vegetable sector toward 2035 - together for increased competitive power, increased demand and more domestic. Report from an advisory committee for innovation and growth in the vegetable sector.
- Gugerell, C., & Penker, M. (2020). Change agents’ perspectives on spatial-Relational proximities and urban food niches. *Sustainability*, 12(6), 2333.
- Guzmán, G. I., López, D., Román, L., & Alonso, A. M. (2013). Participatory action research in agroecology: building local organic food networks in Spain. *Agroecology and Sustainable Food Systems*, 37(1), 127-146.
- Hannevig, L., & Parker, M. (2012). Dialogue - a practical guide (in Norwegian). Flux forlag.
- Hansen, T., & Coenen, L. (2015). The geography of sustainability transitions: Review, synthesis and reflections on an emergent research field. *Environmental Innovation and Societal Transitions*, 17, 92-109.
- Hashem, S., Migliore, G., Schifani, G., Schimmenti, E., & Padel, S. (2018). Motives for buying local, organic food through English box schemes. *British Food Journal*, 120(7), 1600-1614.
- Hebinck, A., Klerck, L., Elzen, B., Kok, K. P., König, B., Schiller, K., Tschersich, J., van Mierlo, B., & von Wirth, T. (2021). Beyond food for thought-Directing sustainability transitions research to address fundamental change in agri-food systems. *Environmental Innovation and Societal Transitions*, 41, 81-85.
- Henderson, E., & Van En, R. (2007). *Sharing the harvest: a citizen's guide to Community Supported Agriculture*. Chelsea Green Publishing.
- Heron, J., & Reason, P. (2008). Extending epistemology with a co-operative inquiry. In P. Reason & H. Bradbury (Eds.), *The SAGE handbook of action research. participative inquiry and practice*. SAGE Publications Ltd.
- Herr, K., & Anderson, G. L. (2015). *The action research dissertation. A guide for students and faculty*. SAGE Publications

- Huttunen, S., Kaljonen, M., Lonkila, A., Rantala, S., Rekola, A., & Paloniemi, R. (2021). Pluralising agency to understand behaviour change in sustainability transitions. *Energy Research & Social Science*, 76, 102067.
- Hvitsand, C., & Kleppe, B. (2011). Utilization of bio fertilizer from biogas plants in agriculture. Practice and experience from Sweden and interaction processes in Norway (in Norwegian). TRI report no. 289. Telemark Research Institute.
- Hvitsand, C. (2014). Organic spearhead – The role of Community Supported Agriculture in enhancing bio economy, and increased knowledge about and consumption of organic food (in Norwegian). TRI report no. 341. Telemark Research Institute.
- Hvitsand, C. (2016). Community Supported Agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers. *Agroecology and Sustainable Food Systems*, 40(4), 333-351.
- Hvitsand, C. (2021). Green Parallel - Experimenting with an alternative food network for organic vegetables and other farm products. Developed by the actors themselves through participatory and co-creative processes in "living lab" (in Norwegian). TRI report no. 634. Telemark Research Institute
- Hvitsand, C., & Brandtzæg, B. (2019). Development of co-creative innovation platforms following the methods of Urban Living Labs (in Norwegian). TRI report no. 470. Telemark Research Institute.
- Hvitsand, C., & Leikvoll, G. K. A. (2023). Alternative food networks: motivations for engaging in and the contribution to more organic production and consumption of food in REKO networks in Norway. *Agroecology and Sustainable Food Systems*, 1-25.
- Hvitsand, C., Leikvoll, G. K. A., Magnussen, E., & Bergius, M. (2022). Sustainable agriculture and work inclusion: Co-creative processes for exploring opportunities for cross-sectorial collaboration (in Norwegian). TRI report no. 1. Telemark Research Institute
- Hvitsand, C., & Richards, B. (2017). Urban Living Labs - the use in Norway and with examples from Europe. TF report no. 393. Telemark Research Institute (in Norwegian). TRI report no. 393. Telemark Research Institute
- IFOAM Organics International. (2019). *Principles of Organic Agriculture*. Brochure.
- Ingram, J. (2015). Framing niche-regime linkage as adaptation: an analysis of learning and innovation networks for sustainable agriculture across Europe. *Journal of Rural Studies*, 40, 59-75.
- IPES-food. (2016). From uniformity to diversity: A paradigm shift from industrial agriculture to diversified agroecological systems. International Panel of Experts on Sustainable Food Systems.
- Ison, R. (2017). *Systems practice: How to act: In situations of uncertainty and complexity in a climate-change world*. Springer.
- Jackson, M. C. (2006). Creative holism: a critical systems approach to complex problem situations. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research*, 23(5), 647-657.
- Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The action research planner: Doing critical participatory action research*. Springer.

- Kivimaa, P., Boon, W., Hyysalo, S., & Klerkx, L. (2019). Towards a typology of intermediaries in sustainability transitions: A systematic review and a research agenda. *Research Policy*, 48(4), 1062-1075.
- Klerkx, L., & Begemann, S. (2020). Supporting food systems transformation: The what, why, who, where and how of mission-oriented agricultural innovation systems. *Agricultural Systems*, 184, 102901.
- Klerkx, L., Aarts, N., & Leeuwis, C. (2010). Adaptive management in agricultural innovation systems: The interactions between innovation networks and their environment. *Agricultural systems*, 103(6), 390-400.
- Kump, B. (2023). Lewin's field theory as a lens for understanding incumbent actors' agency in sustainability transitions. *Environmental Innovation and Societal Transitions*, 46, 100683.
- Kvakkestad, V., Berglann, H., Refsgaard, K., & Flaten, O. (2018). Citizen and consumer evaluation of organic food and farming in Norway. *Organic Agriculture*, 8(2), 87-103.
- Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wiczorek, A., Alkemade, F., Avelino, F., Bergek, A., & Boons, F. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions*, 31, 1-32.
- Lamine, C., Renting, H., Rossi, A., Wiskerke, J., & Brunori, G. (2012). Agri-food systems and territorial development: innovations, new dynamics and changing governance mechanisms. In *Farming Systems Research into the 21st century: The new dynamic* (pp. 229-256). Springer.
- Leach, M., Mearns, R., & Scoones, I. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. *World development*, 27(2), 225-247.
- Lefèvre, A., Perrin, B., Lesur-Dumoulin, C., Salembier, C., & Navarrete, M. (2020). Challenges of complying with both food value chain specifications and agroecology principles in vegetable crop protection [Article]. *Agricultural Systems*, 185, Article 102953.
- Leikvoll, G. K., Aasen, Hvitsand, C., Haugen, I., & Engh, M. (2020). REKO networks: An important sales channel for organic agriculture? (in Norwegian) TRI report no 3. Telemark Research Institute.
- Leventon, J., Fleskens, L., Claringbould, H., Schwilch, G., & Hessel, R. (2016). An applied methodology for stakeholder identification in transdisciplinary research. *Sustainability Science*, 11(5), 763-775.
- Levidow, L., Pimbert, M., & Vanloqueren, G. (2014). Agroecological Research: Conforming—or Transforming the Dominant Agro-Food Regime? *Agroecology and Sustainable Food Systems*, 38(10), 1127-1155.
- Levin, M. (2012). Academic integrity in action research. *Action Research*, 10(2), 133-149.
- Levin, M., & Ravn, J. E. (2007). Involved in praxis and analytical at a distance. *Systemic Practice and Action Research*, 20(1), 1-13.
- Lindström, H., Lundberg, S., & Marklund, P.-O. (2020). How Green Public Procurement can drive conversion of farmland: An empirical analysis of an organic food policy. *Ecological Economics*, 172, 106622.



- Luederitz, C., Schöpke, N., Wiek, A., Lang, D. J., Bergmann, M., Bos, J. J., Burch, S., Davies, A., Evans, J., & König, A. (2017). Learning through evaluation—A tentative evaluative scheme for sustainability transition experiments. *Journal of Cleaner Production*, 169, 61-76.
- Lyson, T. A., & Green, J. (1999). The Agricultural Marketscape: a framework for sustaining agriculture and communities in the Northeast. *Journal of Sustainable Agriculture*, 15(2-3), 133-150.
- Mazzucato, M. (2018). Research & Innovation in the European Union. A problem-solving approach to fuel innovation-led growth. European Commission.
- McIntyre, B. D., Herren, H. R., Wakhungu, J., & Watson, R. T. e. (2009). Agriculture at a crossroads. Global synthesis report. International Assessment of Agricultural Knowledge, Science and Technology for Development.
- Méndez, V. E., Bacon, C. M., & Cohen, R. (2013). Agroecology as a transdisciplinary, participatory, and action-oriented approach. *Agroecology and Sustainable Food Systems*, 37(1), 3-18.
- Merriam, S. B., & Tisdell, E. J. (2018). *Qualitative research: a guide to design and implementation*. Vol. 4th ed. Jossey-Bass.
- Meynard, J.-M., Jeuffroy, M.-H., Le Bail, M., Lefèvre, A., Magrini, M.-B., & Michon, C. (2017). Designing coupled innovations for the sustainability transition of agrifood systems. *Agricultural systems*, 157, 330-339.
- Midgley, G. (2000). *Systemic intervention: philosophy, methodology and practice*. Kluwer Academic.
- Milford, A. B., Kårstad, S., Pettersen, I., Prestvik, A. S., & Storstad, O. (2016). Bottlenecks and opportunities in the value chain for organic fruit, berries and vegetables (in Norwegian). Report vol. 2, no. 36. NIBIO.
- Milford, A. B., Lien, G., & Reed, M. (2021). Different sales channels for different farmers: Local and mainstream marketing of organic fruits and vegetables in Norway. *Journal of Rural Studies*, 88, 279-288.
- Milford, A. B., Prestvik, A. S., & Kårstad, S. (2019). Production and sales of organic fruit, berries and vegetables through alternative markets (in Norwegian). Report vol. 5, no. 95. NIBIO.
- Milford, A. B., Prestvik, A.S., Kårstad, S. (2021). Market gardens in Norway. Challenges and potentials small-scale vegetable production for direct sales (in Norwegian). Report vol. 7, no. 153. NIBIO.
- Ministries (2021). The food nation Norway. Strategy (in Norwegian).
- Ministry of Agriculture and Food (2011). White paper no. 9 (2011-2012) About the agriculture and food policy. Welcome to the table (in Norwegian).
- Ministry of Agriculture and Food (2018). National strategy for organic agriculture (In Norwegian)
- Morse, J. M. (2015). Critical analysis of strategies for determining rigor in qualitative inquiry. *Qualitative health research*, 25(9), 1212-1222.
- Muller, A., Schader, C., Scialabba, N. E.-H., Brüggemann, J., Isensee, A., Erb, K.-H., Smith, P., Klocke, P., Leiber, F., & Stolze, M. (2017). Strategies for feeding the world more sustainably with organic agriculture. *Nature communications*, 8(1), 1-13.

- Norwegian Agricultural Agency (2019a). Production and sale of organic food products. Report for 2018 (in Norwegian).
- Norwegian Agricultural Agency (2019b). Ecology Program 2019-2030.
- Norwegian Directorate on Health (2022). The Norwegian Dietary Guidelines. [http://www.inforegi.no/prod\\_bhg/de-nasjonale-kostholdsrdene/](http://www.inforegi.no/prod_bhg/de-nasjonale-kostholdsrdene/). Retrieved December 10<sup>th</sup> 2022.
- Norwegian Food Safety Authority (2022). Additional information about the regulations for organic agricultural production.
- NOU 2011:4. Official Norwegian Report 2011:4. Food, power and powerlessness (in Norwegian). Ministry of Agriculture and Food.
- O'Brien, K. (2013). Global environmental change III: Closing the gap between knowledge and action. *Progress in Human Geography*, 37(4), 587-596.
- Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of economic perspectives*, 14(3), 137-158.
- Pfeffer, J., & Sutton, R. I. (2000). *The knowing-doing gap: How smart companies turn knowledge into action*. Harvard Business Press.
- Piggot-Irvine, E. (2012). Creating authentic collaboration: A central feature of effectiveness. In Zuber-Skerritt (Eds.), *Action research for sustainable development in a turbulent world*, 89-106.
- Pool, A., & Parker, M. (2017). *Creating futures that matter today. Facilitating change through shared vision*. Executive Savvy.
- Pretty, J. N. (1995). Participatory learning for sustainable agriculture. *World development*, 23(8), 1247-1263.
- Reason, P., & Bradbury, H. (2008). Introduction. In P. Reason & H. Bradbury (Eds.), *Handbook of action research. participative inquiry and practice*. SAGE Publications, Second Edition.
- Renting, H., Marsden, T. K., & Banks, J. (2003). Understanding alternative food networks: exploring the role of short food supply chains in rural development. *Environment and planning A*, 35(3), 393-412.
- Rigby, D., & Cáceres, D. (2001). Organic farming and the sustainability of agricultural systems. *Agricultural systems*, 68(1), 21-40.
- Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy sciences*, 4(2), 155-169.
- Rossi, A. (2017). Beyond food provisioning: The transformative potential of grassroots innovation around food. *Agriculture*, 7(1), Article 6.
- Schein, E. H. (1996). Kurt Lewin's change theory in the field and in the classroom: Notes toward a model of managed learning. *Systems practice*, 9(1), 27-47.
- Schneider, F., Kläy, A., Zimmermann, A. B., Buser, T., Ingalls, M., & Messerli, P. (2019). How can science support the 2030 Agenda for Sustainable Development? Four tasks to tackle the normative dimension of sustainability. *Sustainability Science*, 14(6), 1593-1604.
- Schot, J., & Geels, F. W. (2008). Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy. *Technology analysis & strategic management*, 20(5), 537-554.

- Serikstad, G. L. (2016). Producer collaboration on crop rotation for increased organic vegetable production (in Norwegian). Report vol.1, nr. 6. NORSØK.
- Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental politics*, 16(4), 584-603.
- Skjelvik, J. M., Bruvoll, A., & Erlandsen, A. M. (2017). Evaluation of the endeavor for pilot counties regarding the development of organic agriculture (in Norwegian). Report no. 1. Vista Analyse.
- Smith, A. (2006). Green Niches in Sustainable Development: the case of organic food in the United Kingdom. *Environment and Planning C: Government and Policy*, 24(3), 439-458.
- Smith, A., & Raven, R. (2012). What is protective space? Reconsidering niches in transitions to sustainability. *Research Policy*, 41(6), 1025-1036.
- Steen, K., & van Bueren, E. (2017). The defining characteristics of urban living labs. *Technology Innovation Management Review*, 7(7), 21-33.
- Storstad, O., & Bjørkhaug, H. (2003). Foundations of production and consumption of organic food in Norway: common attitudes among farmers and consumers? *Agriculture and Human Values*, 20(2), 151-163.
- Thompson, J., Millstone, E., Scoones, I., Ely, A., Marshall, F., Shah, E., Stagl, S., & Wilkinson, J. (2007). Agri-food system dynamics: pathways to sustainability in an era of uncertainty. STEPS working paper 4.
- Tjora, A. (2021). *Qualitative research methods in praxis* (Vol. 4th edition). Gyldendal.
- Tracy, S. J. (2010). Qualitative quality: Eight “big-tent” criteria for excellent qualitative research. *Qualitative inquiry*, 16(10), 837-851.
- Tregear, A. (2011). Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of Rural Studies*, 27(4), 419-430.
- Turnheim, B., & Sovacool, B. K. (2020). Forever stuck in old ways? Pluralising incumbencies in sustainability transitions. *Environmental Innovation and Societal Transitions*, 35, 180-184.
- Ulrich, W. (2005). A brief introduction to critical systems heuristics (CSH). *ECOSENSUS project site*.
- UN (2022). *Sustainable Development Goals*. <https://www.un.org/sustainabledevelopment/> Retrieved October 6<sup>th</sup> 2022.
- Vasstrøm, M., Christensen, D., Srisikandarajah, N., & Lieblein, G. (2008). Facilitating agricultural innovation and learning through systemic action research. *Innovation Systems and Rural Development*, 27, 101.
- Vatn, A. (2015). *Environmental governance: institutions, policies and actions*. Edward Elgar Publishing.
- Veidal, A. (2011). Farm based entrepreneurship. A qualitative study of opportunities, motivations and resources for entrepreneurship in agriculture (report in Norwegian). Report no. 6. NILF.
- Wiktionary (2023). The free dictionary. <https://en.wiktionary.org/wiki/participation>. Retrieved March 20<sup>th</sup> 2023.

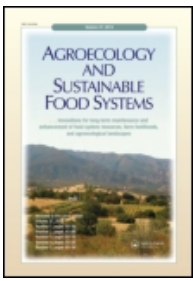
- Vittersø, G., & Tangeland, T. (2015). The role of consumers in transitions towards sustainable food consumption. The case of organic food in Norway. *Journal of Cleaner Production*, 92, 91-99.
- Wittmayer, J. M., & Schäpke, N. (2014). Action, research and participation: roles of researchers in sustainability transitions. *Sustainability Science*, 9(4), 483-496.
- Winter, M. (2003). Embeddedness, the new food economy and defensive localism. *Journal of rural studies*, 19(1), 23-32.
- Yin, R. K. (2013). *Case study research: design and methods*. SAGE Publications.
- Zuber-Skerritt, O. (2012). Introduction to action research for sustainable development in a turbulent world. In *Action research for sustainable development in a turbulent world*, 3-25.

## **7 Articles/Papers**

### **I Paper 1**

Hvitsand, C. (2016). Community Supported Agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers. *Agroecology and Sustainable Food Systems*, 40(4), 333-351.





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## Community supported agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers

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### ABSTRACT

Compared to most other wealthy countries, Norwegian producers and consumers have been somewhat sheltered from the international market, but this has changed over the last decades. As a response to these changes, the number of community supported agriculture (CSA) farms, has grown rapidly in Norway. This article reveals, in depth, why Norwegian producers and consumers engage in CSA and how CSA can be seen as a transformational act toward food system changes. The study reveals that the Norwegian CSA producers, and consumers in general, have distinct values and are motivated by a desire of a production and food system, that safeguards aspects of environment, justice, health, participation, and communication. For them, the farms are an arena for converting societal values into practical actions. The sustainable production methods practiced—and the reallocation of power back to the producers, consumers, and local community—are indicative of the transformational power CSA has had upon the current agri-food system regime. However, the challenge is to upscale these actions, as well as prevent dilution of the core values and agroecological practices seen in the Norwegian CSAs.

### KEYWORDS

Agroecology; community supported agriculture (CSA); current food regime; power relations; transformational act; values and motivations

### Introduction

The concept of community supported agriculture (CSA) has over just the last few years started to emerge rapidly in Norway. Due to a diversity of agricultural and regional policy instruments, in order to maintain domestic food production and settlement in rural areas, Norway has, until recently, been somehow sheltered from the “worst” of globalization. Additionally, the producer-owned cooperatives have made farmers less vulnerable to external influences by guaranteeing receipt of products even from the most secluded and small farms as long as the products meet the set standards (Sørensen and Tennbakk 2002). A Norwegian survey shows that the farmers appreciate that the cooperatives are reducing their economic risks, yet, at the same time, the farmers experience fewer returns in mass production and are unsatisfied

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about the development in the cooperatives (Veidal 2011). Many factors are currently altering the relations between producers and consumers (the rural and the urban), such as the continuing industrialization of domestic production due to international competition (Almås, Bratberg, and Syverud 2014; Borgen, Røkholt, and Sørensen 2006), the increased import of feed and food, development of urban agricultural areas, depopulation of rural areas, and incidents of food scandals (Knutsen 2013; Storstad and Bjørkhaug 2003).

This described situation has led to an increasing demand for local and niche food with added values, and is an important driving force for entrepreneurship in agri-business and the development of alternative food networks, as well as a multifunctional agriculture (Knutsen 2013; Norwegian Agricultural Agency 2014; Zasada 2011). CSA is one such solution.

Many scholars have studied the phenomenon of CSA from different perspectives, but there has not been any in-depth study of the producers and consumers within the CSA movement in Norway or in other Nordic countries. Compared to countries where most other studies have been done, Norway has a relatively large part of the population not living in cities, and many people have some sort of relation to agriculture or ruralness, even though living in urban areas. Further, there is a general engagement from all societal levels in sustaining communities and livelihoods, which might have an influence on values and motivations for initiating or joining a CSA.

Gliessman (2014) notes that there is a need for examples of “transformational” agroecology. This article has the ambition of being such a contribution by presenting how arrangements of CSA diverge from the current agri-food regime and represent a redesign of the food system (c.f. Méndez, Bacon, and Cohen 2013). Further, “transformational” is interpreted in the meaning of being a critique of the current agro-food regime, and “committed to a more just and sustainable future by re-shaping power relations from farm to table (Méndez, Bacon, and Cohen 2013:12).

To investigate the phenomena of CSA further, this article poses the questions:

- Why do people engage in CSA?
- How can CSA be a transformational act for producers and consumers toward food system changes?

The potential for changes in existing regimes will be explored in this article by discovering values, attitudes, and motivations among producers and consumers involved in CSA in Norway, and discussing this in relation to previous international studies and the Norwegian context. The research questions were explored through case studies at five Norwegian CSA farms and by a survey of CSA members at seven farms.

## Transformation of current agri-food regimes

According to Lyson and Green (1999), “the balance between local self-sufficiency and global dependence needs to come back towards the local, rather than continuing on its present trajectory towards the global” in order to sustain agriculture communities (146). Local food systems are characterized by smaller and diverse farms, trust, and networks rather than a few larger and specialized farms, large corporations, and lack of power for farmers, consumers, and local communities to shape their development. And as Torjusen (2004) points out: Trust is fragile and subject to reassessments and changes. Today consumers have declined trust in food when it comes to environment, health, and animal welfare, reinforced by incidents of food scandals in the industrialized and globalized food systems (Renting, Marsden, and Banks 2003; Terragni, Torjusen, and Vittersø 2009; Lamine and Bellon 2009). Simultaneously, there is an increasing demand for greater variety of food that safeguards immaterial quality aspects. As argued, even organic production is generally practiced within the frames of industrialized agriculture with monocultures and dependency on external input, and organic products also as part of the globalized food system distributed to consumer through regular food supply chains of the mass food market. For example, Renting, Marsden, and Banks (2003), Feagan (2007) and Torjusen, Lieblein, and Vittersø (2008) all explain that the industrial production and long food supply chains are pushing organic farming away from its original ideology and disentangling it from the locality. Together these factors are resulting in the emergence of *alternative food networks* with short food supply chains like farmers’ markets, farm shops, subscription box schemes, and CSA. These arrangements are allowing closer relationships between producer and consumer and are to a larger extent supporting sustainable farming and consumption. In Norway, these short food supply chains are increasing the selection of organic food compared to purchases from grocery stores (Skjelvik et al. 2012), unlike what is explained by Thompson and Coskuner-Balli (2007).

The model of CSA is a way of direct communication and distribution of agricultural products between the farm and the consumer, operating outside the regular market (Henderson and Van En 2007; Soil Association 2014; Hvitsand 2014). In CSA, the consumers buy a share of the production, and the partnership includes sharing the risks and benefits of variations of yields with the farmer. In various degrees, members participate in activities such as growing, harvesting, and different events for social and educational purposes. Involvement in decisions about economy and production are also an opportunity, especially at consumer-driven farms.

In general, arrangements of CSAs operate under the *agroecological* concept, which is regarded as to have the potential to accommodate both changes in

agronomy and in society in a sustainable direction (Levidow, Pimbert, and Vanloqueren 2014; Wezel et al. 2009). According to Méndez, Bacon, and Cohen (2013), the agroecological approach is both a long-term oriented focus on the overall design and building of soil fertility, as well as a facilitator of intergenerational benefits, learning, and quality of life. Furthermore, it has the potential to be participatory and action oriented, as well as to accommodate transformations in agro-food systems. An agroecological system is a *redesigned* production system, enhancing playing on the same team as nature with mixed crops, crop rotations, and a focus on nutrient cycling. This is described as a further step in the trajectories within organic farming, as the farmer's transitional process moves forward by learning and participating in new networks. Thus, a confluence of social movements toward sustainable production and consumption (such as alternative food networks and CSA) and agroecological practice (at its best), can contribute to driving toward sustainable food systems (Fernandez et al. 2012).

### Previous studies on motivations for CSA

When it comes to farm economy, the general experience seems to be that the income from CSA is moderate, but predictable, as the payments are coming in advance of the growing season (Henderson and Robyn 2007; Soil Association 2014). Studies from the United States (Tegtmeier and Duffy 2005; Lizio and Lass 2005) and the United Kingdom (SERIO 2012) show that CSA farmers have better income than regular farmers. Additionally, the U.S. National CSA Survey of 2001 found that a majority of CSA farmers felt that the CSA was helping to “improve the ability to meet farm costs, their own compensation, their quality of life, their ability to maintain and improve soil quality and community involvement” (Lass et al. 2003). These studies are likely to have strong implications for motivations for being a CSA farm or to recommend others to do it, especially as Lass et al. (2003) reveals that CSA as a “grassroots movement” mainly consists of relatively small-scale farmers willing to strengthen the movement as a whole. Furthermore, Thompson and Gokcen (2007) have identified forming a CSA as a defiant political act among CSA farmers, regarding their farm's viability if still operating within the framework of the current economic and corporate forces. However, being as ideologically oriented and dedicated as many CSA farmers might be also has a price in the form of self-exploitation and loss of motivation, even though share prices supposedly cover all expenses, including extra labor if necessary (Henderson and Robyn 2007; Galt 2013).

As well as farmers, members seem to profit economically by joining a CSA scheme compared to acquiring the same products at a store (Brown and Miller 2008). However, economic benefit does not seem to be a significant driving force behind becoming a member. According to Kolodinsky and

Pelch (1997), the probability of becoming a member of a CSA increases if a consumer is both that of organic products and holds particular environmental values. Likewise, Brehm and Eisenhauer (2008) find the strongest motivations for joining a CSA to be concerns over the quality of food and how it is produced, while building new social networks seems to be less important. Also, members are generally environmentally oriented have a sense of community attachment and a desire to support their local economy. Thus, Brehm and Eisenhauer (2008) argue that joining the CSA might be “one means to continue to improve their community and retain their high level of satisfaction with their community as a place to live” (110).

According to Thompson and Gokcen (2007), members enjoy being involved in manual work and are part of do-it-yourself (DIY) trend. Additionally, both consumers and farmers appreciate the variation and surprises that come from the field, cultivating the feelings of enchantment by encouraging cooking with fresh produce, trying new recipes and diverging from the efficient and routinized preparation and consumption of food.

Thus, several studies of members' motivation for participating in a CSA scheme coincide, finding concern for ethics and the environment, supporting local agriculture, and accessing local food as important drivers (O'Hara and Stagl 2002; Cox et al. 2008; Brehm and Eisenhauer 2008). At the same time, these consumers put forward a critique of the current global and capitalistic food system. Thompson and Gokcen (2007) argue that participating in a CSA scheme is a form of *ethical consumerism* and of re-territorializing the market system by removing the boundaries between the metropolitan and the rural. Further, CSA “ideologically frame the meanings and social significance of locally grown produce, small organic farms and the community-generating power of food” (277). Terragni, Torjusen, and Vittersø (2009) explain how joining a CSA might be a way of taking some organic consumers a further step away from the mainstream, and “by participating in forms of alternative food consumption people may contribute to defining the agenda of the relevant problems that our society faces and have to cope with, as well as expressing their values and aspirations” (12).

## Methods

This study is based on research of Norwegian CSA farms and consists of a) interviews of key stakeholders at five CSA farms and b) an electronic survey sent to CSA members at seven farms—two of them additional to where the interviews took place. This farms are scattered around the country, but the majority were located in the more populated areas in the eastern part of the country and close to densely populated areas. (Hvitsand 2014). The data was collected during the summer and autumn of 2013 and the winter of 2014.

## **Case studies**

Five CSA farms in Norway were studied from the view of producers (farmers and growers), scheme managers, and core group members, with differences from each farm in relation to their organizational structure. Two of the farms were farmer driven with no core group or manager and, at these farms, the farmer was the main informant. In Norway, there were only four CSA farms until 2013; all these farms are included in the sample. In addition, we included one farm established in 2013 even though their experience with CSA was limited. The farms were visited and the interviews took place as individual or group interviews with the use of semistructured interview guides. Some of the informants were given follow-up phone calls. In addition to interviews, websites, Facebook pages, and other CSA documents were studied. All together, these gave the views of both the production side and the consumer side in relation to background, organization and production, values, motivations, participation, experiences, and challenges. Additionally, a focus group discussion was arranged during a network meeting for Norwegian CSA farms.

## **Survey to CSA members**

In addition to the five case study farms, members at two more CSA farms in Norway received the survey by e-mail. The average response rate was 60.2%, ranging from 52.6 to 78.8% among the farms, and with a total number of 449 respondents completing the questionnaire (done by one adult representative in the household). The survey asked about socioeconomic variables and facts such as distance from home to the farm, duration of membership, degree of participation, and to what extent they depended on the farm to cover their consumption of different food groups. The survey covered attitudes and values, motivations and experienced changes in awareness, environmental practices, social factors, and knowledge. The survey consisted of both closed- and open-ended questions, the latter in order to get a deeper insight into some specific topics.

This article focuses on the results related to attitudes and values among CSA producers and consumers, as well as motivations for joining, or even initiating, a CSA farm.

## **Values and motivations among Norwegian CSA actors**

### ***Norwegian CSA producers want changes***

The farmers and growers argue for the CSA model both on the basis of political arguments related to how food is produced and the way today's food system is working, as well as for the sake of their own economic, professional, and social situation. As a common thread, they are opposed to industrialized

agriculture with chemical pesticides and fertilizers, monocultures, and the amount of food wastage created in the attempt to meet aesthetic standards when delivering through the regular food supply chain—some of these practices are even prevalent in organic farming and food systems. The producers are also seeking alternatives to industrialized organic agriculture, the global food system, and traditional distribution channels, with food security also seen as important. Further, they express concerns about sustaining a viable Norwegian production, and often uses the terms of “food security” and “self-sufficiency” to explain the necessity of locally based and transparent food systems.

One farmer argues that the cooperatives have, in many ways, secured small farmers’ incomes, but at the same time being an intermediary, creating distance between producer and consumer, as well as being part of the system that requires standardized products. Another farmer says this about the situation after his first season with parts of his business as a CSA farm, and with plans to terminate all other supply contracts and convert the whole farm into a CSA:

I own a potato machine worth several hundreds of thousands NOK [Norwegian Krone], have employees and plenty of money in circulation, but am not left with much myself. Prices vary, also with the conventional prices. We are running industrial farming in a small-scale world. We get the animal feed from the other side of the world, we have monocultures and enormous machines, and this doesn’t belong in our agriculture. Labor is expensive. You are supposed to do very good at one product. We don’t have any relation to the consumer, like cultivating products that are nutritious and perfectly clean. In Norway we have had a special situation with the farmer owned cooperatives both for the good and bad.

This quote tells us that the farmer feels uncomfortable and alienated by today’s forms of agriculture. The next summer, virtually the entire farm was run as a CSA with more than 200 members. Instead of delivering grain to wholesalers, the farmer had invested in a small grain mill, and the pigs and hens are used to help clean and aerate the soil and produce fertilizer. This farm is now supporting members with vegetables, legumes and other greens, as well as flour, eggs, and meat, and offers fishing in the river that flows through the farm.

The farmers and growers in our study were organic or biodynamic producers before engaging in CSA, but now increased the diversity in production methods and the selection of plants (about 30 different varieties at each farm). This diversity is explained as part of taking care of soil health and using nature’s own methods of handling pests and threats—and the farmers and growers appreciate the new agronomic challenges. Further, the farms use local, mainly organic, manure in production and focus on nutrient cycling and wastage reduction. In fact, two of the farmers estimated the wastage of organic carrots/potatoes to be as high as 50% when they previously delivered



to wholesalers. On the contrary, they tell that many CSA members are in fact appreciating the different shapes and sizes of products, and the general diversity that they pick up at the field.

The farmers and growers at the case study farms wanted to have more dialogue with the people who actually eat what they produce, and the CSA model allows and facilitates such interaction. This has brought them a more social and challenging workday, with exchange of knowledge and experiences about things such as the cultivation and usage of “new” and seasonal plants as well as the use of more parts of the plants. The dialogue also ensures satisfaction and consistency between supply and demand, which is not necessarily the case in the large-scale food market where there is no direct contact between the supplier and buyer. Members receive newsletters about what is ready to harvest as well as necessary practical work. These newsletters to different degrees also contain tips about how to use the produce, information about meetings and arrangements, as well as the ongoing process of sowing, planting, and growing. Additionally, some farmers and members are active on social media bringing forth the idea of CSA and spreading information on different arrangements and campaigns, as well as participating in general exchanges of worldviews. Some of the farms actively share information about professional challenges and possibilities, seed procurement and plant breeding, and other practical and organizational questions. Additionally, they help with professional support for new CSA growers and farmers, as competence in agroecological growing practices generally is scarce.

The farmers and growers have a strong belief that CSA is the best way of farming for themselves. When it comes to economic considerations, changing from “regular” farming to CSA is argued to be less capital intensive and more predictable because the payments come in advance. The model ensures that the income is not subject to fluctuating yields, as the shares represent a part of the yield and not a certain amount of products. They find the CSA model very attractive and capable of being a livelihood if practiced as intended, that is, a share price that includes all costs of production and to have a proper number of members. However, in practice, it seems like the farmers at the producer-driven CSAs have internal barriers for claiming a high enough share price and to actually share the risks for fluctuating yields with the members. As a consequence, it was expressed at one of these farms, that there is a risk of self-exploitation because of the workload. On the other side, hired farmers in the consumer-driven CSAs claim that they earn more working for the CSA than at their own farm or when hired elsewhere. This is a result of members budgeting the salaries to a level that they believe the growers deserve.

### **CSA members with distinct values and multiple motivations**

Nearly 40% of the households also have children and youth included in the membership. Members are, in general, highly educated, with 93 of the households having at least one adult with higher education. Members mainly live in urban or urban-like areas (95%), and eat less meat and fish than the average Norwegian. (The Vegetarian Association [2015] assumes around 2% to be vegetarian/vegan. In our sample, 5% claim to be vegetarian/vegan and 22% to eat just a little fish/meat.)

Sixty seven percent of the households answering the questions have participated in activities related to their CSA farm, the most common being harvesting and weeding. Other usual activities include sowing and planting and taking part in social and educational arrangements, like Thanksgiving get-togethers or thematic meetings and courses. Additionally, one fifth of the active members have participated at annual meetings and such and, thus, had a democratic voice on how the farm is run regarding such as what to produce the next season and economic dispositions and priorities.

#### **Attitudes and values**

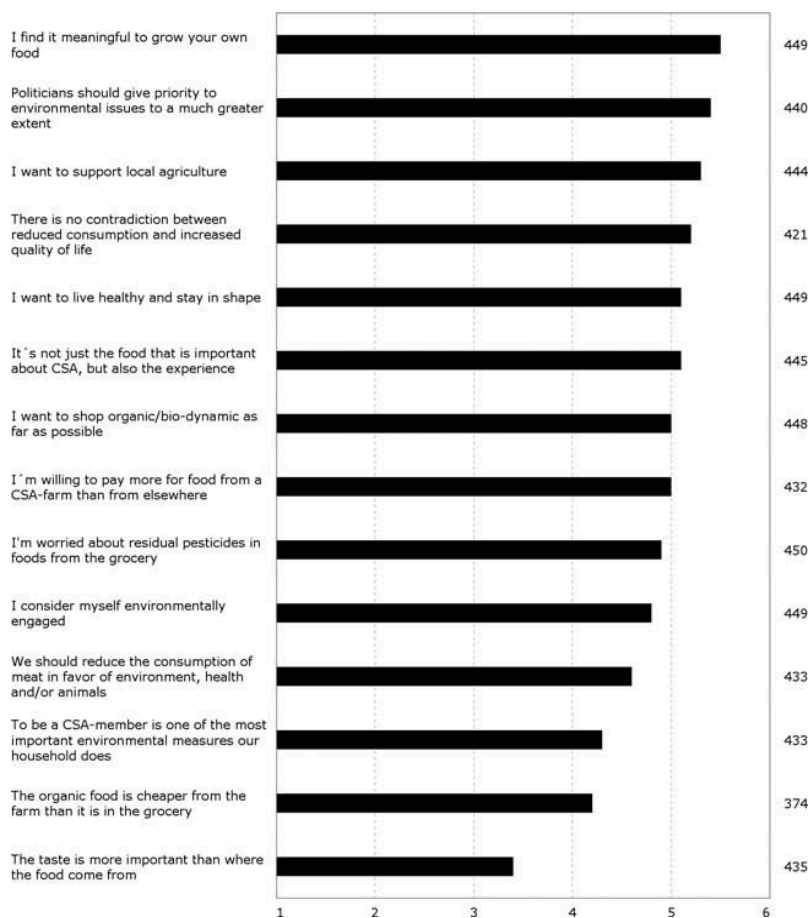
Figure 1 illustrates to what degree the members agree about different statements related to their own attitudes and values on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*).

The statement “Finding it meaningful to grow your own food” is given the highest average score (5.5), which clearly tells that members value the aspects of transparency and participation. Supportive of this finding is the high score (5.1) of the statement “It’s not just the food that is important about CSA, but also the experience.” There is also a general agreement that politicians should prioritize environmental issues to a greater extent (5.4), they find it important to support local agriculture (5.3) and they do not find any contradiction in reduced consumption and increased quality of life (5.2), which implies that they are conscious consumers. Additionally, members are quite worried about pesticide residues (4.9), and being a CSA member is considered quite an important environmental measure for them (4.3). Further, there is, on average, an agreement that there should be a reduction in consumption of meat in favor of environment, health, and animals (4.6). When it comes to economy, members show a willingness to pay more for food from a CSA than elsewhere (5.0), but, at the same time, there is general agreement that organic food is cheaper from the farm than in the grocery (4.2).

#### **Motivations**

Members were presented different possible motivations for joining the CSA, and they could state whether a specific motivation was important or not on a

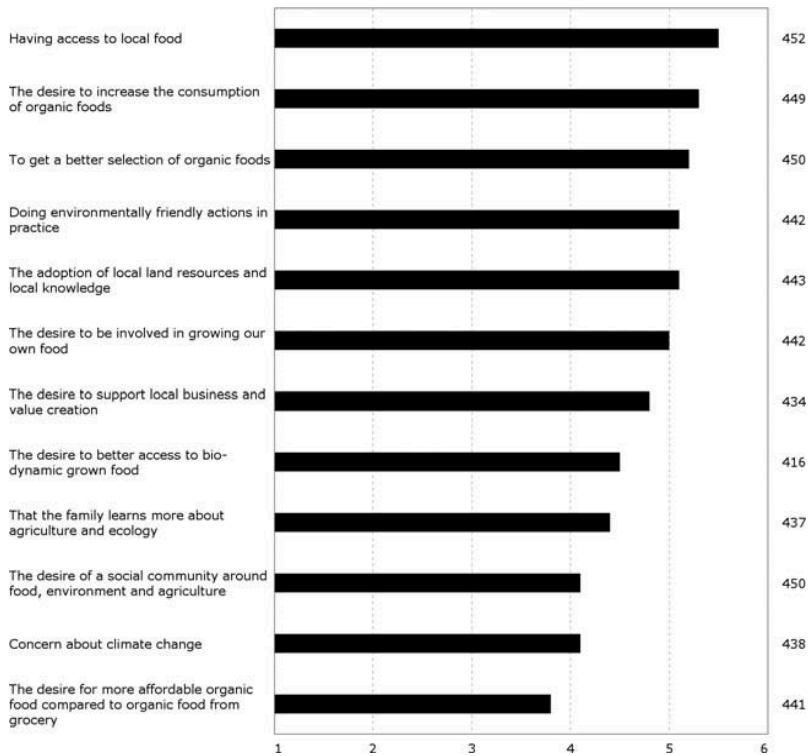




**Figure 1.** Attitudes and values among members. The statements are given scores on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*). Average score on the statements given by the sample.

scale from 1 (*not important*) to 6 (*very important*). As seen in **Figure 2**, members have a complex set of motivations for connecting to a CSA.

Most important, however, is getting better access to local food (average score of 5.5). Further, consumers want to increase their consumption of organic food (5.3) and have a better selection of organic food (5.2) or biodynamic grown food (4.5). In addition, there are high scores on the desire to support environmentally friendly practices (5.1), promotion of local soil resource management and local knowledge (5.1), and support of local business and value generation (4.8). Another important motivation for being a member is the desire to take part in growing their own food (5.0) and (but to a less degree) for the family to learn about agriculture and ecology (4.4 on average, but a noteworthy 4.9 for those with children in the household). The desire to be part of a social community related to food is on average not seen



**Figure 2.** Motivations for being a member of a CSA farm. The statements are given scores on a scale from 1–6, (*not important*) to 6 (*very important*). Average score on the statements given by the sample.

as particularly important (4.1), and neither is concern about climate change (4.1). The respondents, on average, are neutral when it came to a desire for more affordable food as an important motivation for being a member (3.8).

For most motivations, members who are also actively participating at the farm, generally gave higher scores.

In the survey, many members elaborated on their views on why they decided to join, or even initiate, their CSA. Many wanted to expand their choice of organic products beyond what is available at grocery stores, with emphasis on local produce. Additionally, several members described the products to be tasteful, fresh, natural, and nutritious. Further, members were motivated by the opportunity to escape from plastic packaging, pesticides, or worries about genetically engineered food, and instead have food produced with respect for the environment, health, animals, and justice. However, a few members explained that they solely were interested in the fresh and various products without having concerns for any larger societal issues. Similarly, only a few members explicitly expressed that they do not trust the food from the regular food supply chains, yet, by their description of attributes of CSA food, indicate that

these properties are missing from the general mainstream supplies. The search for transparency in production, and sometimes also farm economy, were explained to be important drivers (emphasized during interviews of core members at the case study farms), and to reconnect to the places where the food is produced and to the person who actually produces the food they eat.

One member described motivations like this:

It is a desire for contact with those who grow the food we eat, to contribute to secure and predictable conditions, and recognition for their effort. Gratitude towards the food being produced in such a careful and environmentally friendly way and the possibility to show this and being part of a community that gives the farmer greater job satisfaction.

Additionally, some members express a desire to support agricultural land and farmers and to preserve fertile soils in their urban areas. In fact, one of the CSA farms has put into use agricultural land in the city, which was threatened by development, and a group of neighboring citizens established a cooperative CSA and hired a grower for the land. One member expressed:

It was very important for us that the farm we are members of is used for producing food, because the area is under strong pressure for construction of houses and other buildings, parking spaces and infrastructure. And this despite the fact that this is very good and fertile soil for food production.

Several members claimed that the schemes have given them more choices and they have gotten to know more varieties of vegetables, legumes, and other plants. At the same time, they have learned how to use more of the plants and reduce wastage. Generally, members express that they have learned more about farming and experience greater joy preparing food with fresh and even unexplored ingredients. Further, teaching their children and grandchildren how to produce food in a sustainable way is highlighted by some members to be an important consideration. This may relate to the fact that most members live in urban areas and most likely have had little to do with practical farming before. In addition, others seek a sense of community with like-minded consumers and farmers by sharing knowledge, experiences, and thoughts.

As a result of being part of a CSA two respondents expressed the following effects:

A very good scheme which has increased the consumption of vegetables and the variety in what we eat. The children are doing better eating vegetables, and they have great joy of participating in harvesting vegetables and fruit they are going to eat.

It feels good for both body and soul to work with soil and vegetation, as it gives relaxation and recreation, and an active life.

The study also discovered that many of the members were organic consumers before they took part in the CSA, but the schemes have given them better access and, hence, increased the consumption of organic food. This increase in demand also takes place in organic purchases from other sources.

One respondent was conscious about food production and other aspects of sustainable living, and noted:

I have a superior goal in my life about contributing to establishing sustainable local communities. A local and organic food production is one of several important measures to realize this goal.

This, and the other respondents' comments, indicate that joining the CSA can be viewed as a tool for transforming one's own values and attitudes into practical actions and measures. It is noteworthy that the common interest in food has even led to other forms of cooperation among members. At one farm members share transportation back and forth to the farm; at another farm, a group of members buy organic milk directly from a neighboring dairy farm that also delivers biofertilizer to the CSA farm; at a third farm, members organize joint procurement of local, organic meat and other food items, and have a physical store by the farm.

### **CSA as a transformational act**

According to Méndez, Bacon, and Cohen (2013), a transformational agroecology consists of a critique of the current agro-food regime, and is "committed to a more just and sustainable future by reshaping power relations from farm to table" (12). In the following we argue why the CSA farmers and consumers can be seen as "spearheads," not only within organic farming and consumption, but also as transformational agents on a broader basis.

*For the producers (farmers and growers)* in our study, CSA represents a model that corresponds with their ideology about true organic farming, that is, representing diversity, a local food system with nutrient cycling, the reduction of wastage, and offerings of seasonal produce adjusting to agroecological practices (c.f. Levidow, Pimbert, and Vanloqueren 2014). CSA for them has been a prolonged conversion process going further than intensive conventional organic farming and with a redesigning of the farming system, as described by Lamine and Bellon (2009). As farm economy and organization are related directly toward the consumers, the model also represents an act of independency from the power relations of the current food regime. This independence is reinforced by the experience of more predictability and better economic outcomes by being a CSA farm, a benefit that also has been found throughout the literature (Henderson and Robyn 2007; Soil Association 2014; Tegtmeier and Duffy 2005; Lizio and Lass 2005; SERIO 2012; Lass et al. 2003).

This transformational orientation, with a close relationship and interaction with the ones they are producing for and with, is expected to provide a more social, joyful, and agronomic interesting workday. Our study shows this to be important for the quality of life of the producers, as it counteracts the feeling of alienation caused by the industrial production system with many intermediaries between themselves and the consumers. Renting, Marsden, and Banks (2003) argue that short food supply chains “hold the potential for shifting food production out of its industrial mode” (398), which our study confirms through the high diversity and participatory farm scheme. Additionally, the farmers and growers in our study, to various degrees, are active on social media and other networks in order to share experiences that will help newcomers and to strengthen the movement as a whole—an attitude also found in Lass et al. (2003).

*For the consumers* in our study, the most important motivation for being part of CSA is access to fresh, local, and organic food with greater selection. This must be seen in relation to the fact that Norway does not have chains of natural food stores that are widely available in many other countries. A study of CSAs in the United States shows the opposite—that consumers join CSA despite a limited choice of products in CSAs (Thompson and Coskuner-Balli 2007). On the other hand, in confluence with findings in O’Hara and Stagl (2002), joining a CSA increases members’ consumption of organic food purchased from other sources.

Most members are attracted to CSA because the model offers a lot more than the food itself, like transparency and participatory aspects of production and economy. Generally, the CSA farms in Norway are based on participation from members in practical work such as seeding, weeding, and harvesting. The extent of participation seems to be more extensive than for example in the United States or United Kingdom (Henderson and Robyn 2007; Soil Association 2014), which probably has an influence on who is attracted to the farms. The Norwegian members state that, to a great degree, they find it meaningful to grow their own food and have a desire to be involved in growing their own food. Further, many members express the importance of reattachment to the place where the food is produced and to the person who produces the food they eat (c.f. Feagan 2007). Thompson and Gokcen (2007) found that members cultivate the feelings of enchantment by appreciation of the diversity in crops, varieties within the crops, different sizes and shapes, as well as doing practical manual work at the farm.

At the same time, members want to support local agriculture and protection of soil resources, as Thompson and Gokcen (2007) also found as important motivations. Protection of land resources and fertile soils are important drivers for Norwegian members. Others find it meaningful to connect with other people of similar interests and values in a sense of community, but this was not the most important motivation (see O’Hara and Stagl 2002).

Many consumers noted an expanded knowledge from their interaction with the farmer and the other CSA members, which inspired them in different ways. For example, not only could it lead to use of a broader variety of plants, but even further, could lead to new forms of cooperation among members when it came to other purchases of local, organic food as well as other solutions for product transport. These are examples on how being a member of a CSA farm can reinforce members' values and motivations and take their actions even further through new networks and opportunities. Related to this, it is interesting that the study revealed that motivations for joining the CSA were strongest for members who had participated in activities at the farm.

Further, our results reveal the tendency that, even before becoming a CSA member, members had internalized values and attitudes when it came to ethics around food consumption and production. Several members explained that this is why they got engaged in CSA—a finding that is in confluence with such research as O'Hara and Stagl (2002), who write that many scientists recognize “to the extent that behaviors are learned, they are transmitted by culture and society through families and social groups” (515). Also some of the members in our study stated that they intended to bring the experience further into the next generation through their children and youth. The ideology of CSA fits what we can consider core Norwegian values such as engagement and participation in one's own community, finding closeness to nature and landscape, being active, and spending time outdoors. Bringing these values forth to the next generation is an important part of raising children and is reflected in how families spend leisure time.

Carfagna et al. (2014) argues that “conscious consumers could be early adaptors of practices and behaviors that will diffuse widely. Indeed, many consumer practices and products that are now part of mass consumer culture started among elites” (161). The unconventional organizational model of CSA is itself an act toward food system changes and, thus, is not necessarily dependent on the individual members' motivations and goals of change. Initiators of the CSAs, that is, the farmers in producer-driven and (often) core members in consumer-driven farms, show clear goals of their engagement, and they expand their knowledge and views in interaction with each other. However, our study has shown that not all members necessarily have altruistic or political motivations, but simply want to get themselves fresh food of high quality and great variation. This, to some extent, supports Tregear's (2011) critical reflections about blurring between structural properties of the phenomena of alternative food networks and the goals of the participants within those phenomena.

## Concluding thoughts

Farmers and consumers involved in CSA can be seen as part of a larger alternative food movement in opposition to industrialized agriculture and a globalized food system with its current power relations. Farmers and most consumers are attracted to the CSA model, seeking alternative ways to produce, consume, and communicate around food, where they are actively defining the agenda and with a focus on food security. They want to bring forth fresh, safe, and locally produced food that is produced with care for environment, health, justice, and animal welfare. CSAs are creating local food systems with reallocation of power and are (principally) operating independent of the current power regime. Additionally, as seen today in Norway, the production systems are based on agroecological practices and there is a consistency between supply and demand of products.

The National Movement of Organic Producers and Consumers in Norway—Oikos—is very busy monitoring the stream of CSA initiatives. Additionally, the CSA model is getting attention from the national (conventional) agricultural organizations. The support of these (in Norway) powerful organizations stimulates the fast emergence of CSA farms, but might also be a challenge when it comes to communicating and resisting dilution of the core values and agroecological practices within the current CSA movement. This is especially relevant since CSA farmers and growers often claim a lack of relevant agronomical competence being a barrier to the future development of CSAs.

Thus, the challenge is to transfer and scale-up the progressive engagement and sustainable practices found at the local scale so they can be put on the political agenda, as also concluded by Fernandez et al. (2012). Being part of an alternative food network, and especially the case of the CSA movement, is probably not for the masses of farmers and consumers, but attracts a segment of dedicated organic consumers. Still, the CSA examples as we see them in Norway are capable of showing a direction in agronomic practice and a unique interaction between producers and consumers in the struggle towards sustainable production and consumption. In order to have an influence on the broader society by diffusing practices and experiences outward, it is important that the CSAs are open oriented and communicate their practices and experiences. In this relation, it is interesting that CSA farms and the Norwegian government have somehow coinciding visions and thoughts about future agriculture and food consumption, such as increased food security based on domestic produce, preservation of soil resources, support of local businesses, increased interaction between producer and consumer, and, in general, a more sustainable production. However, to see these visions materialize in a shift in how food is produced and how the food system is organized will be another more difficult question to be explored.



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## References

- Almås, R., E. Bratberg, and G. Syverud. 2014. *Jordbruk i Norge*. [Agriculture in Norway] [https://snl.no/Jordbruk\\_i\\_Norge](https://snl.no/Jordbruk_i_Norge). (accessed November 25, 2014).
- Borgen, S. O., P. O. Røkholt, and A. Sørensen. 2006. *Norsk landbrukssamvirke—fra forvaltning til marked (Norwegian co-operatives—From management to market)*. Oslo: Norwegian Agricultural Economics Research Institute.
- Brehm, J. M., and B. W. Eisenhauer. 2008. Motivations for participating in community-supported agriculture and their relationship with community attachment and social capital. *Southern Rural Sociology* 23(1):94–115.
- Brown, C., and S. Miller. 2008. The impacts of local markets: A review of research on farmers markets and community supported agriculture (CSA). *American Journal of Agricultural Economics* 90(5):1296–302. doi:10.1111/ajae.2008.90.issue-5.
- Carfagna, L. B., E. A. Dubois, C. Fitzmaurice, M. Y. Ouimette, J. B. Schor, M. Willis, and T. Laidley. 2014. An emerging eco-habitus: The reconfiguration of high cultural capital practices among ethical consumers. *Journal of Consumer Culture* doi:10.1177/1469540514526227.
- Cox, R., L. Holloway, L. Venn, L. Dowler, J. R. Hein, M. Kneafsey, and H. Tuomainen. 2008. Common ground? Motivations for participation in a community-supported agriculture scheme. *Local Environment* 13(3):203–18. doi:10.1080/13549830701669153.
- Feagan, R. 2007. The place of food: Mapping out the 'local' in local food systems. *Progress in Human Geography* 31(1):23–42. doi:10.1177/0309132507073527.
- Fernandez, M., K. Goodall, M. Olson, and V. Ernesto Méndez. 2012. Agroecology and alternative agri-food movements in the United States: Toward a sustainable agri-food system. *Agroecology and Sustainable Food Systems* 37(1):115–26. doi:10.1080/10440046.2012.735633.
- Galt, R. E. 2013. The moral economy is a double-edged sword: Explaining farmers' earnings and self-exploitation in community-supported agriculture. *Economic Geography* 89(4):341–65. doi:10.1111/ecge.12015.
- Gliessman, S. 2014. Agroecology and social transformation. *Agroecology and Sustainable Food Systems* 38(10):1125–26. doi:10.1080/21683565.2014.951904.



- Henderson, E., and V. E. Robyn. 2007. *Sharing the harvest: A citizen's guide to community supported agriculture*. White River Junction, VT: Chelsea Green.
- Hvitsand, C. 2014. *Organic spearhead—The role of community supported agriculture in enhancing bio economy, and increased knowledge about and consumption of organic food*. Bø i Telemark, Norway: Telemark Research Institute. [title translated from Norwegian].
- Knutsen, H., ed. 2013. *A view over Norwegian agriculture. state and development trends*. Oslo, Norway: Norwegian Agricultural Economics Research Institute.
- Kolodinsky, J. M., and L. L. Pelch. 1997. Factors influencing the decision to join a community supported agriculture (CSA) farm. *Journal of Sustainable Agriculture* 10(2–3):129–41. doi:10.1300/J064v10n02\_11.
- Lamine, C., and S. Bellon. 2009. Conversion to organic farming: A multidimensional research object at the crossroads of agricultural and social sciences. A review. *Agronomy for Sustainable Development* 29(1):97–112. doi:10.1051/agro:2008007.
- Lass, D., A. Bevis, G. W. Stevenson, J. Hendrickson, and K. Ruhf. 2003. *Community Supported Agriculture entering the 21st century: Results from the 2001 national survey*. Amherst, MA: University of Massachusetts, Department of Resource Economics.
- Levidow, L., M. Pimbert, and G. Vanloqueren. 2014. Agroecological research: Conforming— or transforming the dominant agro-food regime? *Agroecology and Sustainable Food Systems* 38(10):1127–55. doi:10.1080/21683565.2014.951459.
- Lizio, W., and D. A. Lass. 2005. *CSA 2001: An evolving platform for ecological and economical agricultural marketing and production*. Amherst, MA: Department of Resource Economics, University of Massachusetts, Amherst.
- Lyson, T. A., and J. Green. 1999. The agricultural marketscape: A framework for sustaining agriculture and communities in the northeast. *Journal of Sustainable Agriculture* 15(2–3):133–50. doi:10.1300/J064v15n02\_12.
- Méndez, V. E., C. M. Bacon, and R. Cohen. 2013. Agroecology as a transdisciplinary, participatory, and action-oriented approach. *Agroecology and Sustainable Food Systems* 37(1):3–18.
- Norwegian Agricultural Agency. 2014. *Production and turnover of organic agricultural products*. Oslo, Norway: Norwegian Agricultural Agency.
- O'Hara, S. U., and S. Stagl. 2002. Endogenous preferences and sustainable development. *The Journal of Socio-Economics* 31(5):511–27. doi:10.1016/S1053-5357(02)00134-8.
- Renting, H., T. K. Marsden, and J. Banks. 2003. Understanding alternative food networks: Exploring the role of short food supply chains in rural development. *Environment and Planning A* 35(3):393–411. doi:10.1068/a3510.
- SERIO. 2012. *The value of the community food sektor. An economic baseline of community food enterprises*. Plymouth, UK: SERIO [with Plymouth University].
- Skjelvik, J. M., S. Pedersen, M. Tofteng, R. Røtnes, and M. D. Nielsen. 2012. *Evaluering av tilskudd som skal bidra til økt produksjon og forbruk av økologisk mat* [Evaluation of subsidies and grants to enhance organic farming and consumption]. Oslo, Norway: Vista Analyse and Damvad.
- Soil Association. 2014. *A share in the harvest. An action manual for community supported agriculture*, 2nd ed. [www.soilassociation.org](http://www.soilassociation.org).
- Sørensen, A.-C., and B. Tennbakk. 2002. *Regulatory institutions in agricultural markets: A comparative analysis*. Paper prepared for presentation at the 10th EAAE Congress, Exploring Diversity in the European Agri Food System, Zaragoza, Spain, August 28–31.
- Storstad, O., and B. Hilde. 2003. Foundations of production and consumption of organic food in Norway: Common attitudes among farmers and consumers? *Agriculture and Human Values* 20(2):151–63. doi:10.1023/A:1024069627349.

- Tegtmeier, E., and M. Duffy. 2005. *Community supported agriculture (CSA) in the Midwest United States. A regional characterization*. <https://www.leopold.iastate.edu/pubs-and-papers/2005-01-community-supported-agriculture>.
- Terragni, L., H. Torjusen, and G. Vittersø. 2009. The dynamics of alternative food consumption: Contexts, opportunities and transformations. *Anthropology of Food*. <https://aof.revues.org/6400>.
- Thompson, C. J., and C.-B. Gokcen. 2007. Enchanting ethical consumerism the case of community supported agriculture. *Journal of Consumer Culture* 7 (3):275–303. doi:10.1177/1469540507081631.
- Torjusen, H. 2004. *Tillit til mat i det norske markedet. Hvordan oppfatter forbrukere trygg mat?* [Trust in the Norwegian food market: How do consumers perceive safe food?] Oslo, Norway: National Institute for Consumer Research (SIFO).
- Torjusen, H., G. Lieblein, and G. Vittersø. 2008. Learning, communicating and eating in local food-systems: The case of organic box schemes in Denmark and Norway. *Local Environment* 13(3):219–34. doi:10.1080/13549830701669252.
- Tregear, A. 2011. Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of Rural Studies* 27(4):419–30. doi:10.1016/j.jrurstud.2011.06.003.
- Vegetarian Association. 2015. *En innføring i vegetarkost: introduksjon*. [http://veg-veg.no/vegetar/hva\\_er\\_vegetarisme](http://veg-veg.no/vegetar/hva_er_vegetarisme) (accessed January 15, 2015).
- Veidal, A. 2011. *Farm based entrepreneurship. A qualitative study of opportunities, motivations and resources for entrepreneurship in agriculture*. Oslo, Norway: Norwegian Agricultural Economics Research Institute.
- Wezel, A., S. Bellon, T. Dore, C. Francis, D. Vallod, and C. David. 2009. Agroecology as a science, a movement or a practice. *Agronomy for Sustainable Development* doi:10.1051/agro/2009004.
- Zasada, I. 2011. Multifunctional peri-urban agriculture—A review of societal demands and the provision of goods and services by farming. *Land Use Policy* 28(4):639–48. doi:10.1016/j.landusepol.2011.01.008.

## II Paper 2

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## Article

# Know the Farmer That Feeds You: A Cross-Country Analysis of Spatial-Relational Proximities and the Attractiveness of Community Supported Agriculture

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**Abstract:** While food production and consumption processes worldwide are characterized by geographical and social distance, alternative food networks aim to reconnect producers and consumers. Our study proposes a framework to distinguish multiple dimensions of proximity in the context of Community Supported Agriculture (a type of alternative food network) and to quantitatively evaluate them. In a principal component analysis, we aggregated various detailed proximity items from a multinational survey using principal component analysis and examined their relationship with the attractiveness of Community Supported Agriculture in a multiple regression analysis. Our findings highlight the importance of relational proximity and thus of increasing trust, collaboration, and the sharing of values and knowledge within and across organizations in the food system. Rather than focusing on spatial proximity, increasing relational proximity might support alternative food networks, such as Community Supported Agriculture.

**Keywords:** community supported agriculture; alternative food networks; spatial proximity; relational proximity; cross-national case study

## 1. Introduction

The current agricultural and food industry is based on labor division and connects companies in different regions, countries, and sometimes also continents [1]. As a result, production and consumption processes often take place at a great geographical and social distance [2]. Alternative food networks (AFNs) aim to overcome this distance by anchoring food in its socio-ecological context and thus promote direct producer-consumer relationships [3,4]. AFNs therefore pose an alternative to the mainstream, industrial food system [3,5]. Community Supported Agriculture (CSA) is a food production and distribution model in which farming responsibilities, risks, and rewards are shared between farmers and consumers [6]. They have mainly been established in or close to urban areas, where people are more spatially separated and alienated from food production than people in rural areas [7,8].

Previous research on AFNs has pointed especially to the importance of spatial dynamics and the essential role of place in building alternative food systems [9,10], as well as the socio-cultural embeddedness of food in local relations of food provision [3,11]. Therefore, scholars highlighted the positive effects of local contexts on social ties and innovation processes [3]. However, food system actors are interconnected due to various spatial-relational configurations [12]. Close producer-consumer relations may also be performed

“at a distance” [13–15]. To provide an attractive alternative to conventional food provision, AFNs aim to rebuild production and consumption processes [5].

In this context, we find it purposeful to utilize the term “proximity” and Boschma’s [16] differentiation between relational (i.e., social, cognitive, institutional, and organizational) proximity and spatial (i.e., geographical) proximity dimensions [16,17]. Using the proximity concept could be one way to expand our knowledge of what makes AFNs, such as CSAs, attractive, and to better understand what constitutes attractive relationships between CSA members (i.e., consumers and producers) and between CSA members and society in general [16,18].

While CSA literature [19,20] highlights implications of geographical proximity, to our knowledge, only one study related Boschma’s [16] broader perspective on proximity dimensions to CSAs [21]. However, in an ever-evolving body of knowledge, critical questions on various spatial–relational configurations associated with AFNs are being debated [15,22–25]. With respect to CSAs, this includes motivations to join the CSA scheme [26–30], challenges CSAs face in retaining members [31–34], the institutionalization of CSA principles [35] and up-scaling processes [36,37], as well as the extent to which CSAs succeed in creating an alternative to conventional practices in the market [3]. Furthermore, the appeal of CSAs has been investigated in previous studies [38–41]. Interrelating the latter to the different dimensions of spatial and relational proximity configurations promises new insights for better understanding the role of spatial–relational proximity for the attractiveness of CSA and other AFNs. Thus, we also hope to gain some insights into what factors should be used to promote AFNs—a knowledge gap that has been attributed to their recentness [25].

More generally, we want to contribute to relational rural sociology. In theory, human-to-human relations and relations between humans and their bio-physical context (farm, land, infrastructure) are well debated (for an overview, see [42]). However, the relational perspective still poses various methodological challenges, such as shifting the analytical attention from nodes, objects, and subjects to their relations [42]. Taking the example of CSA, we want to demonstrate that proximity theory can help to operationalize geographical, social, cognitive, institutional, and organizational relations of CSA members with their social and bio-physical contexts using a quantitative multi-variate analysis and thus complement Actor–Network Theory, providing graphical or visceral methods that help to empirically analyze human-to-human, human–technology, or human–nature relations [42].

Our literature analysis revealed that there are hardly any studies quantitatively differentiating between spatial–relational proximity dimensions and their role in AFN attractiveness. Taking the example of CSA, an AFN implemented in different parts of the world, this study examines the interrelation of spatial–relational proximity with CSA’s attractiveness. CSA attractiveness has been investigated in several studies, but, to our knowledge, not yet regarding different proximity dimensions. More generally, the measurement of organizational attraction dates back to early research, such as Vroom [43], who measured the attractiveness of different organizations to potential job seekers using a single item. A few years later, Singh [44] applied information integration theory to organization choice using a single item that assessed the likelihood of accepting a job with the company. We assume that organizational attractiveness can also help to understand the membership in non-profit organizations, such as CSAs. Recent studies have analyzed member satisfaction within CSAs [38–41]. In the literature, CSA attractiveness and satisfaction have been measured with single items, so there is no multi-item attractiveness scale yet.

The empirical analysis is based on data from several countries. We selected Austria, Japan, and Norway for this cross-national case study, as their national CSA movements have developed differently. However, the organization of CSA movements in these countries is similar (see Section 3 for further justification of study sites).

By interviewing CSA members in different (peri-)urban contexts, we aim to understand better the relevance of proximity dimensions for the attractiveness of the CSA model. We distinguish between spatial and relational proximity among CSA members (CSA-

internal proximity) as well as between CSA members and CSA-external actors, structures, and resources (CSA-external proximity). The central research question of our study is: How are spatial and relational proximity within and outside CSAs related to the attractiveness of CSAs in (peri-)urban contexts? Based on proximity and the CSA literature (see Section 2), we hypothesize that there is a positive correlation between all dimensions of social proximity and attractiveness, except for institutional and organizational proximity to external actors (as members may seek to distance themselves from dominant food organizations and deviate from prevailing rules and standards).

This paper is structured as follows. First, we briefly review proximity literature and present assumptions about proximity and CSAs (Section 2). We then describe our research design and data collection process in Section 3. In Section 4, we create proximity variables using principal components analysis. In a multiple linear regression, we analyze the interrelation between these proximity variables and CSA attractiveness. Section 5 discusses the results and the limitations of the study. Finally, in Section 6, we conclude the paper by highlighting its empirical and methodological contributions.

## 2. Theoretical Background on Proximity and Operationalization for CSA

Theoretical definitions of proximity dimensions have been proposed by scholars [16,45,46] aiming to understand the coordination of economic activities. Boschma [16] differentiated between five dimensions of proximity: geographical proximity (i.e., spatial proximity), as well as social, institutional, cognitive, and organizational proximity. The latter four can be subsumed under the umbrella of relational proximity (i.e., non-spatial proximity), because they conceptually overlap (i.e., they are intangible dimensions based on affinity and similarity) and often coexist in practice [47]. The five proximity dimensions were later adapted to the field of sustainability innovation [48]. The sustainability of AFNs, such as CSAs, has been addressed in previous studies [49–51]. The CSA concept represents an alternative, sustainability-oriented model of food provision that addresses social justice, community, and environmental sustainability. Thus, we conceptualize CSA as a social innovation [52,53]. While previous scholars have examined proximity dimensions with a focus on innovation [16], this paper analyzes the exploratory value of proximity dimensions for CSA attractiveness. Since proximity dimensions have not previously been operationalized for analyzing CSA attractiveness, we ground our assumptions on a broader base in the literature on proximity and CSA.

Scholars associate geographical proximity with physical distance between actors [16,48] and local availability of natural resources [48]. Cognitive proximity is understood as a base of knowledge, competence, and expectation shared between actors. Knowledge and expectations that lead to the emergence of innovations need to be shared to create a mutual understanding between actors [16,48]. Social proximity is defined by trust-building activities between actors. Mutual trust based on friendship, kinship, and mutual experience is a prerequisite for collaborations before knowledge or resources are deployed between actors [16,48]. Institutional proximity refers to the similarity of contextual rules, norms, and values, e.g., the similarities of actors to external institutions, such as prevailing rules and regulations within a system (i.e., the rules and regulations by which actors play) [16,48,54]. Finally, organizational proximity refers to the extent to which relationships are shared among actors in a formal, organizational arrangement, including the degree of autonomy and control under which actors can experiment and share knowledge [16,48]. The different proximity dimensions may support, complement, or replace each other [55,56]. Thus, the occurrence of relational proximity could replace the need for geographical proximity as a precondition for experimentation and learning. Furthermore, social proximity complemented by cognitive proximity can support the transmission of “value-laden information” between actors without the need to enforce external standards [22]. However, previous studies point to the positive effects of proximity while neglecting the potential impediments that arise from it [48]. Thus, geographic proximity might constrain organizations in accessing land and resources and in competing with other

local actors. While institutional proximity of alternative (e.g., social) innovations to prevailing food system structures could promote effective cross-level learning and coordination, being too rule-bound could hinder experimentation [48]. The greater the trust relationships within or between actors, the less organizational control is required by or between actors. However, tendencies toward excessive trust between actors can also be detrimental to their collaboration [48].

Due to their complementary, substitutive, and supporting nature, the analytically clearly delineated proximity dimensions can be quite messy in real-life and therefore difficult to measure empirically. Therefore, we opted for an explorative approach (see Section 3.1). Based on previous definitions by scholars [16,48,54] and interpretations of proximity dimensions in the context of CSAs [21], we operationalized social, cognitive, institutional, organizational, and geographical proximity:

- Operationalization of geographical proximity: The spatial distance among CSA members (i.e., their access to the CSA farm) (CSA-internal) and the local availability of resources and structures for the CSA farm (e.g., farmland, urban area, infrastructure) (CSA-external) [16,21,48].
- Operationalization of cognitive proximity: The degree to which CSA members empathize with CSA ideas and thus share knowledge, competence, and expectations with respect to CSAs (CSA-internal), and, as CSA-external actors, the degree of interest in and understanding of the CSA model (CSA-external) [16,21,48].
- Operationalization of social proximity: The degree of connections among CSA members (i.e., their trust in each other) (CSA-internal) and societal acceptance (i.e., attitudes) between CSA members and CSA-external actors (CSA-external) [16,21,48].
- Operationalization of institutional proximity: The extent to which CSA rules, norms, and values are shared among CSA members (CSA-internal), and the similarities of the CSA institutions to external, prevailing food system institutions (i.e., production and market mechanisms of dominant food system actors) (CSA-external) [16,21,48,54].
- Operationalization of organizational proximity: The degree to which the CSA members are connected to other CSA members (CSA-internal) and CSA-external actors (CSA-external) in a formal, organizational arrangement [16,21,48].

Figure 1 illustrates the operationalization of spatial and relational proximity dimensions in the context of CSAs. The figure differentiates between CSA-internal proximity (i.e., arrows illustrating proximity among CSA members) and CSA-external proximity (i.e., arrows illustrating proximity between CSA members and CSA-external actors, structures, and resources).

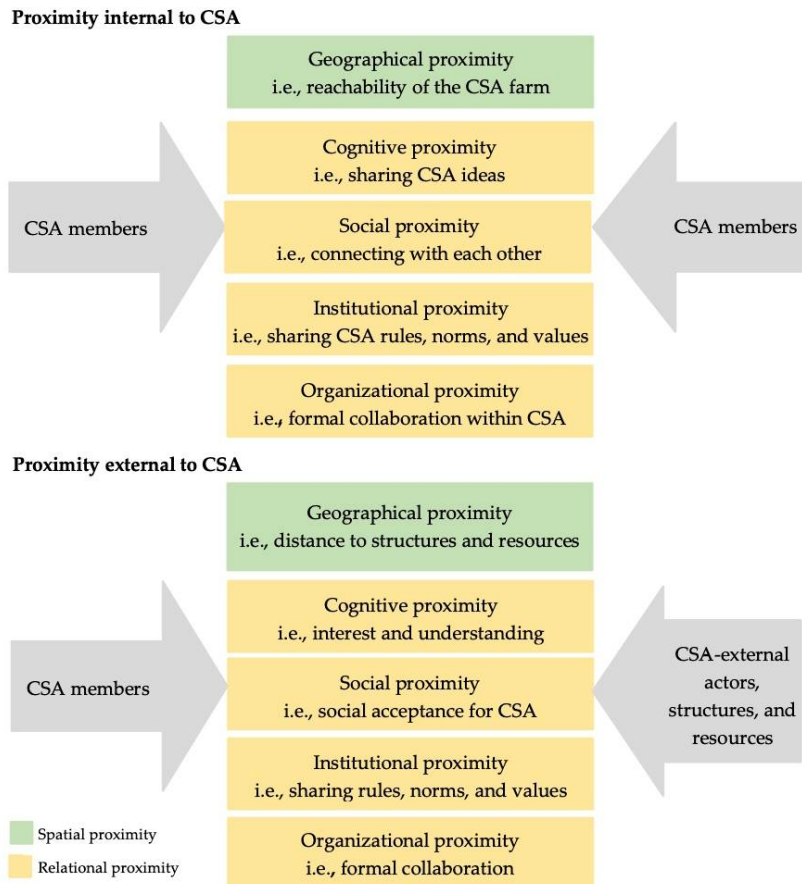
Operationalizing the proximity dimensions for the CSA context and a literature review on CSAs in Austria, Japan, Norway, and beyond helped to make assumptions about how the different proximity dimensions might affect CSAs and their attractiveness in these countries. This review also helped to tailor the statements and questions for the cross-national contexts (see Section 3.1).

- Geographical proximity: In general, CSAs seem to face a trade-off between the locational advantages of rural and urban areas. While CSAs target affordable access to biophysically suitable farmland that is predominantly located in rural areas, a CSA which has a location in or near a city with mainly urban CSA consumers represents a locational advantage (e.g., access to public transportation, infrastructure, networking opportunities) [21]. Thus, by being close to rural and urban areas, a CSA could stimulate a mutual understanding (i.e., cognitive proximity) between people in rural and urban areas (see next point) [30].
- Cognitive proximity: CSA members in Austria share knowledge, competence, and expectations of CSA ideas (e.g., pricing based on self-assessment) with each other, and therefore predominantly connect with individuals already connected to the CSA community (i.e., members of other CSA initiatives) [21]. CSA members' empathy for CSA ideas promotes their endorsement of the CSA [57]. However, Austrian CSA members raised the concern that CSA ideas might be too difficult to under-



stand for actors outside the CSA [21]. With the expansion of mainstream organic food marketing channels in Japan, the interest in CSAs among CSA-external actors is decreasing [58,59]. Thus, in terms of cognitive proximity, Japanese teikei might lack the ability to adapt to the expectations of today's consumers [21]. In contrast, the growing demand for locally and organically produced food and a trend toward urban gardening in Norway might explain the growing interest of Norwegians in CSA and the rapid growth of CSAs in Norway [30,60–62].

- **Social proximity:** Personal contact with food system actors can increase trust or distrust in the system [63]. CSAs aim to create social proximity among their members by connecting them through network relationships, organizing meetings and events, and participatory decision making [21,30,57,60]. CSA members in Austria highlighted that trust-building activities among CSA members and with society are important for the CSA. Though they have built strong connections with other local CSA actors, relations with other (dominant) food system actors are rare, as stated by CSA members [21]. In Japan, building trusting relationships with actors outside their (teikei) community might be even more challenging due to a more collectivist pattern [64]. While trust within established and stable relationships (such as the teikei community) might be higher than in individualistic societies (i.e., Norway and Austria), it has been observed that Japanese tend to distrust actors outside these relationships [65].
- **Institutional proximity:** Several studies indicate that Austrian, Japanese, and Norwegian CSA members try to avoid institutionalizing the CSA but rather aim to disrupt conventional food provision practices, rules, norms, and values [21,35,59,66]. They aim to contrast the mainstream and seek an alternative form of food provision [67,68], characterized by typical CSA features (e.g., small-scale operation, short value chains, transparent food provision, social and ecological sustainability) [18,25,60]. Austrian and Norwegian CSAs emerged in response to the conventionalization of the organic food market (i.e., a process in which the organic food market increasingly takes on the characteristics/institutions of mainstream industrial agriculture), and thus CSA members tend to criticize the dominant structures of the food system [21,60,69,70]. In contrast, CSAs emerged in Japan before the Japanese organic food market became conventional, in response to the negative effects of chemically intensive and mechanized agriculture. However, the expansion and institutionalization (i.e., the introduction of a certification system and other government policies to adapt to the dominant structures of the conventional food system) of the organic market since the 1980s, as well as the introduction of a certification system for organic food, were largely responsible for the decline of CSAs in Japan [59].
- **Organizational proximity:** Due to the shared organizational arrangement, organizational proximity among members of the original teikei type (i.e., OF-OC teikei scheme) and European CSA organizations is high. However, formal collaboration between CSAs and other (dominant) food system actors seems to be less relevant for Austrian and Japanese CSA members [21,59]. In contrast, Norwegian CSAs receive financial and technical support as well as advisory services. The association Organic Norway, the Agricultural Extension Service, the Norwegian Agriculture Agency, and several county governors have been particularly supportive of CSAs, promoting them, and playing an important role in the development of CSAs in Norway [60,71,72]. Although closer links to non-CSA actors, such as government and public institutions, could generate additional resources for CSAs, they may also lead to a loss of independence [73].



**Figure 1.** Operationalized spatial–relational proximity dimensions for the CSA (Community Supported Agriculture) context.

Finally, demographic factors could also be related to the attractiveness of a CSA. They might partly explain the development of CSAs in Japan, Austria, and Norway. To maintain the essence of CSA, CSA members are strongly encouraged to actively participate in various activities [58], regardless of their age and gender [5,74]. However, while young people might be less interested in joining a CSA, the physical support expected by CSAs (e.g., work in the fields) can be particularly challenging for older people [58,59]. Furthermore, it can be difficult to work full time and participate in a CSA [58]. Most CSA members are women [57,58]. In Japan, housewives have historically been the driving force behind CSAs, but as more women pursue a career, membership is declining [58].

### 3. Data and Methodology

This paper analytically differentiates between various proximity dimensions in the context of CSA and examines how these dimensions relate to CSA attractiveness. This section explains the research design used, including site selection, the design of the quantitative analysis, the creation of proximity variables, and their interrelation with CSA attractiveness.

### 3.1. Site Selection

We applied the proximity framework in three very different national contexts. Drawing on a literature review, Internet research, and informal talks with CSA coordinators, we selected six CSAs in Austria, Japan, and Norway because they share organizational similarities, even though CSA development paths differ in these countries.

CSA has its origins in various countries. One of them is Japan, where the CSA movement, also known as *teikei*, originated in 1971 [75]. In Japan, there are different types of *teikei* schemes, ranging from associations with 20–30 households and a single farm to hundreds or thousands of households and multiple farmers [75]. Most of today's *teikei* systems trade agricultural products to individual consumers who are not organized (e.g., farmers delivering vegetable boxes to consumers). Hence, they require little or no consumer participation (e.g., for agricultural and delivery labor) [75–77]. The original form of *teikei*, consisting of a group of organized farmers and consumers (OF–OC *teikei* scheme), experienced rapid growth until the 1980s (there were about 238 *teikeis* in 1990) [58,77]. Since then, it has gradually lost popularity, especially among younger families [58], and in 2019, there were only about ten active OF–OC *teikei* schemes [78]. This study focuses only on the OF–OC *teikei* scheme, as its formal arrangement is similar to the CSA schemes in Austria and Norway.

Austria experienced an increase in CSAs in the first years after the introduction of CSA in 2011. However, CSA in Austria developed late and slowly compared to other countries in Europe and beyond [6,67,79]. In 2020, there were approximately 30 CSA organizations in Austria [66]. The development of CSAs in Austria has been stagnating in recent years [21].

In contrast, the popularity of CSAs in Norway, a non-EU country, has grown rapidly since their initial introduction in 2006 [60]. It is expected that their popularity will continue to grow [62]. In Norway, the number of registered CSAs reached 92 in 2020 [72].

Because CSA arrangements vary across initiatives [6], we selected six similar CSA cases (two per country) for our study. The six selected CSAs have a similar formal structure (i.e., organizational proximity), in that product prices are collectively negotiated and there is an emphasis on the year-round commitment of members.

### 3.2. Setting up the Quantitative Analysis

For data collection, we designed a cross-national survey on proximity related to CSA attractiveness in Austria, Japan, and Norway. We collected data from CSA members, including farm owners/managers via online and in-person questionnaires. Based on the literature presented in Section 2, the proximity dimensions were operationalized for the CSA questionnaire. The common questionnaire first introduced the objectives of the cross-national study. The first questions addressed CSA-internal relational proximity among CSA members. Furthermore, the questionnaire included questions on CSA-internal geographical proximity (i.e., CSA members' accessibility to the CSA farm) and the geographical proximity of the CSA farm to external structures and resources (i.e., suitable farmland, urban areas, services, network structures, and other community activities). In order to gather information on CSA-external relational proximity, respondents were asked about broader societal contexts of the CSA, such as attitudes, interest, and the level of support by CSA-external actors. The questionnaire included other parts for different research objectives not presented here (see Supplementary Materials). In cases where respondents did not hold information, they could skip questions about CSA collaboration with other food system actors and questions about the policy context that influences the CSA. For these two topics, we relied on the answers of respondents who indicated that they were in a leading position within a CSA ( $n = 14$ ) (as demonstrated by the number and types of activities as well as the working hours for the CSA stated in the questionnaires) to avoid guessing and to ensure the validity of the answers. The questionnaires concluded with demographic questions about the respondent. We translated the questionnaires into German, Japanese, and Norwegian and distributed them to members of six CSAs (two CSAs per country, each in a different city) (Table 1).

**Table 1.** Selected CSAs and number of respondents in Austria, Japan and Norway.

Country	(Peri-)urban Areas	CSA Members	Surveys (n = 209)	Organizational Similarities
Austria	Vienna	About 300	51	Collective price negotiation;
	Graz	About 100	27	
Norway	Sandefjord	About 140	39	Year-round commitment of members;
	Porsgrunn	About 120	49	
Japan	Tokyo	About 40	25	Participative decision-making processes
	Tsukuba	About 40	18	

Regarding the total number of CSA members, CSA coordinators indicated a lack of data, as the number is constantly changing. In addition, one or more family member/s often split one harvest share (i.e., the amount of produce dedicated to one CSA member), but the exact number is missing. So, we cannot assess the representativeness of the sample. However, this should not be an issue as we do not aim to provide representative insights into the CSA model, but to analyze the relationships between proximity and attractiveness. Data collection resulted in a total of 209 questionnaires (after excluding 19 surveys with too many missing values and/or outliers) that were analyzed using principal component analysis, and 208 questionnaires that were included in the regression modeling (only respondents whose gender was indicated). IBM SPSS Statistics 24 software (IBM, Armonk, NY, USA) supported both principal component analysis and regression modeling. Table 2 illustrates the demographic characteristics of CSA members who responded to our survey.

**Table 2.** Demographic characteristics of respondents.

Variable	Category	Austria (in %)	Japan (in %)	Norway (in %)
Country		37.3	20.6	42.1
Gender	Female	65.4	74.4	81.4
	Male	34.6	25.6	17.4
	Diverse	0.0	0.0	1.2
Age	>24 years	6.5	0.0	0.0
	25–44 years	50.6	25.6	19.8
	45–64 years	33.8	37.2	45.3
	>65 years	9.1	37.2	34.9
Work condition	Working full-time	25.3	9.3	37.6
	Working part-time	24.0	14.0	9.4
	Being self-employed	14.7	20.9	15.3
	Being not employed (studying, retirement, parental leave, unemployment)	28.0	41.9	36.5
	Other	8.0	14.0	1.2

### 3.3. Creating Proximity Variables

To create the variables for our model, we measured the spatial–relational proximity items on six-point scales with equally distanced intervals (interval scale of 1 (not significant/disagree/not given/not attractive) to 6 (very significant, completely agree/absolutely given/very attractive). Proximity variables measured with more than a single item on graphically equally distanced 6-point scales were treated as continuous data. Thus, we measured proximity variables with more than a single item and ensured graphically equal distances between response patterns in the survey design [80]. Similar to Rossi and Woods [41] and Galt [38], who measured satisfaction with CSA on a single-item scale, we measured CSA attractiveness on a six-point scale based on the question: “To what extent is CSA attractive to you?”

The operationalization of spatial and relational proximity dimensions for the CSA context provided the basis for developing the proximity statements. Table 3 presents all operationalized proximity items in our survey. We asked about the importance of the proximity items to CSA participation (i.e., CSA-internal relational proximity), for the extent to which proximity items were present by participant (i.e., CSA-internal and -external geographical proximity), and for participants' agreement with proximity items (i.e., relational proximity to CSA-external actors). We used an explorative principal component analysis to weight, reduce, and linearly combine the operationalized proximity items (i.e., items describing the overlapping, complementary, and partially substitutive proximity dimensions in the context of CSA presented above). Principal component analysis allowed us to create a small number of synthetic variables (i.e., principal components reflecting different proximity dimensions) from a large number of operationalized proximity items and to test whether the structure of the principal components could be related to latent proximity dimensions similar to those described in the literature [16,21,48]. The resulting variables (i.e., principal components) then served as explanatory variables for the multiple linear regression [81].

The survey also captured perceptions about proximity among CSA members. These proximities refer to linkages within the same CSA to assess social, cognitive, institutional, and geographical proximity among CSA members. For internal linkages, we asked CSA members about the significance of several items for their participation in a CSA: connection with the local CSA community and farmer (i.e., social proximity); empathy with the CSA idea of risk sharing and ensuring a secure income for local farmers (i.e., cognitive proximity); independence from the regular food market and its prices, thus supporting a new food market; and traceability and transparency of food production (i.e., institutional proximity). In addition, we asked CSA members about the accessibility of the CSA farm from their homes by car, bike, or on foot, as well as by public transportation (i.e., geographical proximity).

We also operationalized the proximity of CSA members to actors, structures, and resources outside of CSAs. Thus, the survey included questions on perceptions of the social, cognitive, institutional, and organizational proximity of CSA members to CSA-external actors, as well as the geographical proximity of CSA members to the urban areas, infrastructure, and agricultural land. Hence, we asked CSA members to assess how they perceive CSA-external actors' attitudes toward the CSA (i.e., social proximity), how understandable the CSA model is to CSA-external actors, and how they perceive the public interest in the CSA (i.e., cognitive proximity). Because members characterized the CSA preferably by institutional distance from the dominant structures of the food system [21,57], we also asked about external institutional linkages. Thus, we asked CSA members about their agreement with CSA's institutional orientation on independence from dominant product and market mechanisms of the food system to avoid institutional proximity to the latter. Furthermore, we asked members in a leading position within the CSA about the degree and type of support they received from CSA-external actors (i.e., organizational proximity). Finally, CSA members were asked about the availability of infrastructure and social activities near their CSA farm, access to suitable land for agricultural production, and the proximity of their CSA farm to an urban area (i.e., geographical proximity).

### 3.4. Interrelating Proximity to CSA Attractiveness

To analyze the interrelation between proximity variables and CSA attractiveness, we applied both a binary logistic model (which divides the responses on CSA attractiveness into two groups: "very attractive" and "less attractive") and a multiple linear regression (which measures CSA attractiveness on a 6-point interval scale based on equal distances between response patterns in the survey). The two analyses showed basically the same outcome, indicating the robustness of the results. Although an ordered logit model might be more appropriate in terms of model assumptions, linear regression also has some advantages. Therefore, we chose to present the linear regression results here because they

can be interpreted more intuitively. In addition, as users of the results, CSA members are more familiar with linear regression results. Finally, the simpler model is equally well suited for presenting the results.

**Table 3.** Operationalized items of spatial–relational proximity dimensions.

CSA-Internal Proximity	Operationalized Proximity Items as Presented in the Questionnaire	Mean	Standard Deviation
Social proximity among CSA members	Significance of connecting with the CSA community	4.53	1.360
	Significance of direct connection with the CSA farmer	4.83	1.227
Cognitive proximity among CSA members	Significance of empathy for CSA ideas of risk sharing and ensuring a secure income for local farmers	5.23	1.145
Institutional proximity among CSA members	Significance of traceability of food and transparency of production	5.48	0.818
	Significance of becoming more independent from the regular agricultural market and its prices	4.95	1.298
	Significance to support the development of a new and more sustainable agricultural market	5.63	0.758
Geographical proximity among CSA members	Extent of connection to CSA farm via road network for driving	5.48	0.871
	Extent of connection to CSA farm via road network for biking/walking	4.93	1.308
	Extent of connection of public transport system to the CSA farm	3.90	1.659
CSA-external proximity	Operationalized proximity item in survey	Mean	Standard deviation
Social proximity between members and CSA-external actors	Agreement that attitudes of the CSA are in general positive	4.26	1.300
Cognitive proximity between CSA-external actors and CSA members	Agreement that local interest in CSA is increasing in recent years	4.25	1.552
	Agreement that CSA model is easy to understand for CSA-external actors	3.28	1.557
	Agreement that media often reports about CSAs *	2.03	1.202
Organizational proximity between CSA-external actors and CSA members	Agreement to support/impediment by CSA-external actors (e.g., by governmental organizations, agricultural associations, food businesses, farmers, other CSAs, NGOs, private actors) **		
	Agreement that the CSA should cooperate with dominant actors and organizations of the food system and encourage them to become more sustainable *	3.34	1.797
Institutional proximity between CSA-external actors and CSA members	Agreement that the CSA should stay independent and small-scale, to be an alternative to the production and market mechanisms of the dominant actors of the food system *	4.57	1.846
	Agreement that the CSA should not adapt to the production and market mechanisms of the dominant actors of the food system, to grow faster and gain power *	5.10 recoded	1.207
Geographical proximity between CSA farm and urban area, infrastructure, and agricultural land	Extent of suitability of land and climate for agricultural production	5.33	0.829
	Extent of proximity of the CSA farm to the city *	4.58	1.340
	Extent of services nearby the CSA farm	3.16	1.646
	Extent of other community activities nearby the CSA farm	3.28	1.575
	Extent of networking opportunities nearby the CSA farm	3.19	1.446

\* Items have been excluded before conducting the principal component analysis, as all correlations to other items were  $\leq 0.3$  (two-tailed Pearson correlation) \*\* Items have been excluded before conducting the principal component analysis, as only members in a leading position within the CSA responded. Results are not presented in the table but are qualitatively described in Section 4.2.

Multiple linear regression shows the correlation between CSA attractiveness (i.e., the dependent variable) and the latent proximity dimensions identified in the principal component analysis (i.e., the explanatory variables) (see Section 4.1). Furthermore, we added dummy-coded categorical variables to the regression to examine the extent to which demographic variables might explain CSA attractiveness. We selected country, age, gender, and work situation based on the demographic variables highlighted in the CSA literature (see Section 2). We also collected data on the geographical distance (measured as the linear distance in kilometers based on zip codes) of the location of CSA members and the CSA farm and distance in minutes needed to access the farm. Since these variables did not show correlations with the attractiveness variable, we did not include them in the regression. Before running the multiple linear regression, we checked the data for linearity, multicollinearity, and homoscedasticity [81].

#### 4. Results

We created five latent proximity variables that served as explanatory variables for the multiple linear regression to explain CSA attractiveness [81]. The results of the principal component analysis and the reliability analysis are shown in Table 4.

**Table 4.** Results of the principal component analysis and the reliability analysis ( $n = 209$ ).

Factor Loadings ▼	Principal Components ►	1	2	3	4	5
<i>Principal component 1: Social–cognitive proximity among CSA members</i>						
Connection with CSA farmer(s) (CSA-internal social proximity)		0.845				
Connection with CSA community (CSA-internal social proximity)		0.682				
Empathy for CSA ideas (CSA-internal cognitive proximity)		0.675				
<i>Principal component 2: CSA farm's geographical proximity to CSA members and land</i>						
Road for biking/walking (CSA-internal geographical proximity)			0.797			
Road for driving (CSA-internal geographical proximity)			0.724			
Suitability of land (CSA-external geographical proximity)			0.679			
Public transport (CSA-internal geographical proximity)			0.552			
<i>Principal component 3: CSA farm's geographic proximity to external structures and resources</i>						
Community activities nearby (CSA-external geographical proximity)				0.793		
Services nearby (CSA-external geographical proximity)				0.748		
Networking nearby (CSA-external geographical proximity)				0.687		
<i>Principal component 4: CSA-external social–cognitive proximity</i>						
Positive attitudes about CSA (CSA-external social proximity)					0.742	
Local interest in CSA (CSA-external cognitive proximity)					0.720	
Understanding CSA model (CSA-external cognitive proximity)					0.624	
<i>Principal component 5: Institutional proximity among CSA members</i>						
Support of the new food market (CSA-internal proximity)						0.842
Independence from the regular market (CSA-internal proximity)						0.578
Traceability and transparency (CSA-internal proximity)						0.540
Eigenvalue		2.068	2.019	1.887	1.766	1.617
% of Variance		12.928	12.620	11.791	11.039	10.106
Cumulative %		12.928	25.548	37.340	48.379	58.485
Cronbach's Alpha		0.696	0.646	0.723	0.636	0.546

Note: Extraction method: principal component analysis (Bartlett's test of Sphericity: Significance: 0.000 (i.e., highly significant); Kaiser-Meyer Olkin Measure of Sampling Adequacy: 0.651 (i.e., relatively low but sufficient for our study, should be greater than 0.5 as a bare minimum); Residuals: there are 57 (47.0%) non-redundant residuals with absolute values greater than 0.05 (i.e., albeit the residuals with 47% of >0.05 are relatively high, they are below the 50% threshold) Rotation method: Varimax with Kaiser Normalization. Only factor loadings over 0.5 are shown. Rotation converged in 5 iterations [81].

Table 4 shows that analysis results in five principal components with an Eigenvalue greater than 1 [82]. In total, these principal components explain 55.616% of the variance. All factor loadings of the five principal components are above the acceptable limit of 0.5 [81]. Principal components 1–4 are internally consistent, as the values of Cronbach's



alpha (i.e., a measure of internal consistency that indicates the extent to which all items in a test measure describe the same concept or construct) are in the range of 0.636 and 0.723, which are satisfactory values for exploratory research [83,84]. In contrast to the other principal components, Cronbach's alpha of principal component 5 is low, with a value of 0.546. Because this value is still respectable for social science studies [84], we included principal component 5 in the regression. The resulting factors in the rotated component matrix correspond to five different proximity dimensions:

- Principal component 1 groups CSA-internal social and cognitive proximities among CSA members. We labelled this factor *social–cognitive proximity among CSA members*.
- Principal component 2 includes variables describing *CSA farm's geographic proximity to CSA members and land* (hence the name of this component). The variables illustrate the location conflict between the proximity to CSA members, mainly located in the city, and suitable land for cultivation by the CSA farm.
- Principal component 3 also contains geographic variables that ask about *the CSA farm's geographic proximity to external structures and resources* (i.e., the name of this component), such as infrastructures and nearby services.
- Principal component 4 captures the CSA-external social and cognitive relations between the CSA members and CSA-external actors. We have referred to principal component 4 as *CSA-external social–cognitive proximity*.
- Principal component 5 contains variables on CSA members' institutional proximity. Therefore, we termed principal component 5 *institutional proximity among CSA members*.

#### 4.1. Interrelating Proximity to CSA Attractiveness

Multiple linear regression allowed us to explain the value of CSA attractiveness (i.e., the dependent variable) with the latent proximity variables (i.e., the explanatory variables) and demographic data (Table 5).

**Table 5.** Results of the multiple linear regression ( $n = 208$ ).

No.	Variables	B <sub>1</sub>	Standard Error <sub>2</sub>	$\beta$ <sub>3</sub>	SIGNIFICANCE <sub>4</sub>
	Constant	5.574	0.160		0.000
1	Principal component 1	0.248	0.052	0.330	0.000
2	Principal component 2	0.031	0.057	0.041	0.587
3	Principal component 3	−0.050	0.053	−0.066	0.350
4	Principal component 4	0.200	0.062	0.264	0.002
5	Principal component 5	0.115	0.053	0.144	0.032
6	Country: Japan	0.039	0.174	0.021	0.823
7	Country: Norway	0.108	0.139	0.070	0.436
8	Age: <24	−1.038	0.371	−0.193	0.006
9	Age: 25–44	−0.065	0.124	−0.040	0.601
10	Age: >65	−0.047	0.153	−0.027	0.758
11	Gender: Male	−0.251	0.118	−0.145	0.035
12	Employment: Full-time	−0.086	0.151	−0.050	0.572
13	Employment: Part-time	0.104	0.167	0.050	0.533
14	Employment: Self-employed	−0.098	0.165	−0.048	0.552
15	Employment: Other	−0.014	0.227	−0.004	0.952

Dependent variable: CSA attractiveness; in bold when  $p < 0.05$ . Reference variables: Age: 45–64; Country: Austria, Gender: Female; Work situation: Not employed (i.e., studying, retired, on parental leave, unemployed). (1): The B-values refer to the relationship between CSA attractiveness and each predictor. A positive value indicates a positive relationship between the predictor and the dependent variable, whereas a negative coefficient represents a negative relationship [81]. (2): The standard error associated with each B value indicates how these values vary in different samples [81]. (3): Beta values ( $\beta$ ) are standardized versions of the B values. They are measured in standard deviation units and are directly comparable (as they do not depend on the units of measure of the variables). Thus, they provide better insight into the importance of a predictor in the model [81]. (4): If the *t*-test associated with a B-value is significant (if the significance value is less than 0.05), then the predictor contributes significantly to the model. The smaller the significance value, the greater the contribution of the predictor [81].



Our results show a statistically significant fit of the data, as indicated by an *F*-test statistic of 3.953 (i.e., the *F*-test looks at whether using the regression model predicts the values of the dependent variable significantly better than using the mean of the dependent variable. If the improvement from fitting the regression model is much greater than the imprecision within the model, then the *F*-value is greater than 1 [81]) and a *p*-value below the 0.05 level. The model explains 24.8% of the variance in CSA attractiveness [81]. Principal component 1 (i.e., social–cognitive proximity among CSA members) and principal component 4 (i.e., CSA-external social–cognitive proximity) are positively related to CSA attractiveness ( $p < 5\%$ ). The standardized beta value for principal component 1 ( $\beta = 0.330$ ) indicates that social–cognitive proximity among CSA members shows the strongest interrelation with the attractiveness rating, followed by principal component 4 ( $\beta = 0.264$ ) (i.e., CSA-external social–cognitive proximity). Furthermore, our results suggest that principal component 5 ( $\beta = 0.144$ ) (i.e., institutional proximity among CSA members) is also positively related to CSA attractiveness ( $p < 0.05$ ). Finally, principal component 2 (i.e., CSA farm’s geographical proximity to members and land), and principal component 3 (i.e., CSA farm’s geographical proximity to external structures) are not significantly related to the respondents’ attractiveness ratings.

Compared to their reference group, the regression coefficients of two dummy variables in the multiple linear regression proved to be statistically significant: first, CSA members aged under 24 years ( $\beta = -0.193$ ) consider CSAs less attractive than the reference group of CSA members aged between 45 and 64 years; second, male CSA members ( $\beta = -0.145$ ) consider CSAs less attractive than their female counterparts.

#### 4.2. Descriptive Analysis of Country-Specific Results on Institutional and Organizational Proximity

The regression does not indicate a country effect. However, we also wanted to take a closer look at institutional and organizational proximity variables. Although these variables were collected in the survey, they were excluded from the analysis due to a lack of correlations or respondents (see proximity items highlighted with \* and \*\* in Table 3). For institutional proximity between CSA-external actors and CSA members, participants rated their agreement to adapt their CSA to, and independence from, production and market mechanisms of the dominant food system actors. Table 6 shows that CSA members agreed ( $\bar{O} = 4.57$ ) and disagreed ( $\bar{O} = 1.70$ ) with CSA’s independence from production and market mechanisms of the dominant actors. A cross-country comparison reveals that CSA members in all three countries disagreed with the CSA’s adaption to dominant food system structures. However, while Austrian and Norwegian CSA members agree with CSA’s independence from dominant food system structures, Japanese CSA members slightly disagree with the latter ( $\bar{O} = 3.19$ ).

**Table 6.** Institutional proximity to dominant food system structures ( $n = 209$ ).

	CSA Independence from Dominant Structures		CSA Adaption to Dominant Structures	
	Mean	Standard Deviation	Mean	Standard Deviation
Total ( $n = 209$ )	4.57	1.864	1.70	1.282
Austria	5.54	0.878	1.65	1.215
Japan	3.19	2.239	1.81	1.500
Norway	4.40	1.797	1.68	1.282

In terms of organizational proximity, CSA members in all three countries did not fully agree ( $\bar{O} = 3.34$ ,  $n = 209$ ) that CSAs should work with dominant food system actors to encourage them to become more sustainable. Furthermore, members who hold leadership positions within their CSAs ( $n = 14$ ) rated the level of support and hindrance from other organizations in the food system to reveal their organizational proximity to the CSA.

Norwegian CSA members perceived financial support from local, federal, and provincial governments (e.g., by Innovation Norway and county governors) during the establishment phase, but also desired support thereafter. The Norwegian CSA network, organized by the association Organic Norway (formerly OIKOS), has supported CSAs with networking opportunities and has increased their visibility. Furthermore, the Norwegian Agricultural Extension Service provides training and advice to organic farmers, including CSAs.

In contrast, Japanese and Austrian CSA members perceive the local, federal and provincial government, as well as organic associations, as rather unsupportive. Although they receive farm subsidies from the government (like any other farm), there is no specific financial support for the CSA scheme. Austrian CSA members point to the support from other CSAs, private individuals, farmers, and farmer markets in the form of financial support, space and infrastructure, networking opportunities, and advice. Japanese CSA members mentioned that they have been mainly supported by private individuals and a CSA study group in terms of visibility, networking, infrastructure, and machinery.

## 5. Discussion

In our exploratory analysis, we operationalized spatial–relational proximity dimensions for a multivariate analysis of CSA attractiveness. We differentiate not only between geographical, social, organizational, institutional, and cognitive proximity, but also between CSA-internal relations among members and CSA-external relations between members and external actors, as well as structures and resources. In the first step of our analysis, we used principal component analysis to create five latent proximity variables for CSA.

Principal components 2 and 3 (i.e., items loading on CSA geographical proximity) and 5 (items loading on institutional proximity) indicate latent variables corresponding to the proximity dimensions differentiated in the literature. In principle component 2, we have items describing geographical proximity to other members (internal) and land (which we labeled as external geographical proximity). However, the respondents seem to distinguish less between the human–bio-physical divide and more between what they perceive as part of the CSA, which for them includes members and farmland. In retrospect, this makes a lot of sense. Social–cognitive principal components 1 and 4 combine two proximity variables that have been analytically differentiated in the literature [16,21,48]. On the one hand, this result might confirm the supportive, complementary, or substitutive nature of proximity dimensions [55,56]. The dimensions that are clearly differentiated analytically might be messily interwoven in real life. On the other hand, the complementarity of social and cognitive proximity dimensions might be due to inadequate operationalization in survey items.

Multiple linear regression (as well as binary logistic regression) showed differences in the interrelations of latent proximity variables with members' CSA attractiveness ratings in Austria, Japan, and Norway. As hypothesized, relational proximities (i.e., social, cognitive, and institutional proximity) significantly predict CSA attractiveness in our model. Surprisingly and contrary to our hypothesis, however, this was not the case for the two geographical proximity variables. Social–cognitive proximity among CSA members (i.e., principal component 1) shows the strongest interrelation with member attractiveness ratings in the model. Thus, connection to other CSA members and farmer(s), as well as the sharing of CSA ideas, seem to be closely related to members' perceptions of CSA attractiveness. Furthermore, CSA-external social–cognitive proximity (i.e., principal component 4) shows the second highest correlation with CSA attractiveness in the model. Thus, CSA attractiveness might increase with a growing understanding of a rising interest in and a positive attitude toward the CSA and its concept in society. Our results confirm the importance of trust-building interactions within and outside the CSA [21]. Additionally, we confirm that empathy for the CSA model (i.e., cognitive proximity) promotes approval of the CSA, which was also addressed by Samoggia et al. [57].

Institutional proximity: Previous studies [18,21,60,67] emphasized that CSA institutions (i.e., rules, norms, values) contrast with the dominant institutions of the food system.

Therefore, in this study, we assumed that institutional proximity among CSA members reflects their shared values and identity based on being different from dominant food system structures. However, the related component 5 (i.e., institutional proximity among CSA members) shows low reliability with a Cronbach's alpha of 0.546. Future analyses are needed with other or more items to increase the reliability of an institutional proximity scale [81]. Multiple linear regression suggests that institutional proximity among CSA members (i.e., principal component 5) might be positively related to CSA attractiveness. Thus, the latter increases as CSA members strive for more independence from the regular food market and the establishment of a new one, as well as for traceable and transparent food (production).

Descriptive analysis shows that respondents criticized prevailing rules, norms, and values in the food system, wanted to change the latter, and aimed to avoid institutionalization of the CSA scheme, which is consistent with the findings of previous studies [21,60]. Most respondents in the three countries studies agreed that CSA schemes should rather avoid an adaption to the dominant institutions of the food system. In other words, they do not want to conform to the latter. Following Coenen et al. [48], alternative (e.g., social) innovations (such as CSA), could be limited in their freedom and experimentation if they were oriented towards dominant institutions. Thus, too much institutional proximity to CSA-external (dominant) food system actors could have a negative impact on CSA attractiveness, as our study shows. However, the institutional distance of CSAs from dominant structures might also hinder cross-level learning, collaboration, and coordination between CSAs and dominant food system actors.

Organizational proximity: In Austria and Japan, political support for CSAs seems to be low. Austrian and Japanese CSA members stated that there has been support, if any, from other alternative innovations or private actors. In contrast, Norwegian CSA members pointed to various supporting measures for their CSAs from government organizations and interest groups, which Devik [71] and Hvitsand [30] had already pointed out. This might explain why organizational proximity of the CSA to dominant food system actors is perceived as relatively low, especially by Austrian and Japanese respondents (as described in Section 4.2). CSA members slightly disagree that their CSA should collaborate with dominant actors to encourage them to become more sustainable. CSA members might lack trust toward dominant food system actors (i.e., lack of social proximity) [21] and may be afraid of too much dependence and organizational control by the latter [48,73].

Geographical proximity: The regression demonstrated that the principal components related to geographical proximity (i.e., principal components 2 and 3) do not predict CSA attractiveness. Thus, the latter is neither significantly increased by the accessibility to members of a CSA farm from their homes nor by CSA farms' access to suitable farmland, the urban area, infrastructure, and social activities nearby. Linear distance (kilometers) and travel time variables from respondents' homes to the CSA farm did not correlate with the attractiveness ratings. This result might be different if we had also included non-members in our sample or members who live far away. The CSA membership of our respondents might result from a self-selection process that is strongly influenced by geographical proximity. On the other hand, the distance between members and the CSA farm is less relevant for CSA models in which members do not pick up the food at the farm but at one of several collection sites near the CSA members. In this case, distance to food collection points is more important than distance to the farm. Therefore, our results do not necessarily indicate that geographical proximity is irrelevant to sustainable food systems. However, our model suggests that relational proximity might be more relevant to CSA attractiveness than spatial proximity (i.e., geographical proximity). Although the overall goal of CSAs is to connect producers and consumers [3,5], which might be easier in spatially proximate situations, the latter might also be achieved "at a distance" [5,14,15]. Therefore, the focus of CSAs on relational proximity could reduce or even partially replace the importance of spatial (i.e., geographical) proximity [22].

Demographic variables: The generally low proportion of young members in our sample, especially in the Japanese and Norwegian subsamples, is in line with the Japanese literature [55,56]. The regression also shows that CSA attractiveness is significantly lower for the youngest age group (age: <24) compared to the reference group (age: 45–64). Furthermore, we found that most CSA members in all three country subsamples are females, as already highlighted by previous scholars [57,58]. Consequently, the regression demonstrated that male CSA members consider CSAs less attractive than female respondents. Finally, neither respondent nationality nor work situation showed a significant interrelation with attractiveness ratings. A limitation of our analysis is that we could not include comparable economic data (such as household income) that have been identified as relevant in other studies [39]. Furthermore, the survey was conducted only with Austrian, Japanese, and Norwegian CSA members (and not with former members or non-members) of six CSAs in three different countries. This limitation of our study points to the importance of studying CSAs in different countries and with nonmembers.

Finally, the development of CSAs has been stagnating in Austria and even declining in Japan. In Norway, on the other hand, the number of CSA farms has been steadily increasing, partly due to the supportive attitude of public bodies and various agricultural organizations, especially the association Organic Norway, towards CSAs.

## 6. Conclusions

Since AFNs (such as CSAs) have only recently come into existence, there still is a lack of knowledge about which factors should be used to promote them [25]. This article shows that the notion of proximity can help operationalize geographical, socio-cognitive, organizational, and institutional relations as explanatory variables in a linear regression model of CSA attractiveness. Multivariate analysis of empirical data from six CSA groups in Norway, Japan, and Austria highlights the importance of social–cognitive and institutional proximity to CSA attractiveness and thus, the relevance of increased trust, collaboration, shared knowledge, and shared values within and across organizations in the food system. Rather than focusing on geographical proximity, supporting social–cognitive and institutional relations within the CSA and beyond might support CSAs' attractiveness. The lack of a country effect suggests that the findings might be robust across socio-cultural and political contexts.

Future research could address this study's possible limitations of operationalization (i.e., the complementarity of social and cognitive proximity; the low reliability of principal component 5), and limitations of our sample (i.e., no inclusion of non-CSA members and economic data of respondents).

In our study, items for geographical, social, cognitive, institutional, and organizational dimensions of proximity were operationalized and tested. They cover network-internal and -external relations, human-to-human relations, and the relations of AFN members to their bio-physical context of land or infrastructure. We hope that our small methodological contribution will be useful for future structured AFN surveys and the advancement of diverse methods in relational rural sociology.

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**Institutional Review Board Statement:** Considering the UNESCO Recommendation for Science and Scientific Researchers, this international comparative study followed social science ethical standards: transparency on study purpose, informed consent by CSA leaders and by individual respondents, privacy and anonymity, care in methods selection and analysis, no vulnerable groups involved. As BOKU established its Ethics Commission after data collection, this study was not subject to a formalized ethical review and approval.

**Data Availability Statement:** The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions.

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## References

1. Ermann, U.; Langthaler, E.; Penker, M.; Schermer, M. *Agro-Food Studies: Eine Einführung*; UTB Böhlau Verlag: Vienna, Austria, 2018; p. 260.
2. Krausmann, F.; Langthaler, E. Food regimes and their trade links: A socio-ecological perspective. *Ecol. Econ.* **2019**, *160*, 87–95. [CrossRef]
3. Hinrichs, C.C. Embeddedness and local food systems: Notes on two types of direct agricultural market. *J. Rural. Stud.* **2000**, *16*, 295–303. [CrossRef]
4. Penker, M. Mapping and measuring the ecological embeddedness of food supply chains. *Geoforum* **2006**, *37*, 368–379. [CrossRef]
5. Renting, H.; Marsden, T.; Banks, J. Understanding alternative food networks: Exploring the role of short food supply chains in rural development. *Environ. Plan. A Econ. Space* **2003**, *35*, 393–411. [CrossRef]
6. Weckenbrock, P.; Volz, P.; Parot, J.; Cressot, N. Introduction to Community Supported Agriculture in Europe. In *Overview of Community Supported Agriculture in Europe*; European CSA Research Group: Aubagne, France, 2016; pp. 8–10.
7. Jossart-Marcelli, P.; Bosco, F.J. Alternative food projects, localization and neoliberal urban development. *Métropoles* **2014**, *15*. [CrossRef]
8. Watson, D.J. Working the fields: The organization of labor in community supported agriculture. *Organization* **2020**, *27*, 291–313. [CrossRef]
9. Brunori, G.; Bartolini, F. Local agri-food systems in a global world: Market, social and environmental challenges. *Eur. Rev. Agric. Econ.* **2013**, *40*, 408–411. [CrossRef]
10. Darnhofer, I.; Gibbon, D.; Dedieu, B. *Farming Systems Research into the 21st Century: The New Dynamic*; Springer: Dordrecht, The Netherlands, 2012.
11. Schermer, M. From “Food from Nowhere” to “Food from Here:” Changing producer—Consumer relations in Austria. *Agric. Hum. Values* **2015**, *32*, 121–132. [CrossRef]
12. DuPuis, E.M.; Goodman, D. Should we go “home” to eat? Towards a reflexive politics of localism. *J. Rural. Stud.* **2005**, *21*, 359–371. [CrossRef]
13. Milestad, R.; Westberg, L.; Geber, U.; Björklund, J. Enhancing adaptive capacity in food systems: Learning at farmers' markets in Sweden. *Ecol. Soc.* **2010**, *15*, 29–46. [CrossRef]
14. Kneafsey, M.; Venn, L.; Schmutz, U.; Trenchard, L.; Eyden-Wood, T.; Bos, E.; Sutton, G.; Blackett, M. Short Food Supply Chains and Local Food Systems in the EU. 2013. Available online: [https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS\\_BRI\(2016\)586650](https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2016)586650) (accessed on 18 January 2021). [CrossRef]
15. Watts, D.C.H.; Ilbery, B.; Maye, D. Making reconnections in agro-food geography: Alternative systems of food provision. *Prog. Hum. Geogr.* **2005**, *29*, 22–40. [CrossRef]
16. Boschma, R. Proximity and innovation: A critical assessment. *Reg. Stud.* **2005**, *39*, 61–74. [CrossRef]
17. Aubry, C.; Kebir, L. Shortening food supply chains: A means for maintaining agriculture close to urban areas? The case of the French metropolitan area of Paris. *Food Policy* **2013**, *41*, 85–93. [CrossRef]
18. Abrahams, C.N. Globally useful conceptions of alternative food networks in the developing south: The case of Johannesburg's urban food supply system. In *Alternative Food Geographies: Representation and Practice*; Maye, D., Holloway, L., Kneafsey, M., Eds.; Emerald: Bingley, UK, 2007; pp. 95–114.
19. Sitaker, M.; McGuirt, J.T.; Wang, W.; Kolodinsky, J.; Seguin, R.A. Spatial considerations for implementing two direct-to-consumer food models in two states. *Sustainability* **2019**, *11*, 2081. [CrossRef]
20. Struś, M.; Kalisik-Medelska, M.; Nadolny, M.; Kachniarz, M.; Raftowicz, M. Community-supported agriculture as a perspective model for the development of small agricultural holding in the region. *Sustainability* **2020**, *12*, 2656. [CrossRef]
21. Gugerell, C.; Penker, M. Change Agents' Perspectives on Spatial-Relational Proximities and Urban Food Niches. *Sustainability* **2020**, *12*, 2333. [CrossRef]

22. Dubois, A. Translocal practices and proximities in short quality food chains at the periphery: The case of North Swedish farmers. *Agric. Hum. Values* **2019**, *236*, 763–778. [[CrossRef](#)]
23. Edelman, H.; Quiñones-Ruiz, X.F.; Penker, M. Analytic Framework to Determine Proximity in Relationship Coffee Models. *Sociol. Rural.* **2019**, *60*, 458–481. [[CrossRef](#)] [[PubMed](#)]
24. Kebir, L.; Torre, A. Geographical proximity and new short supply food chains. In *Creative Industries and Innovation in Europe, Concepts, Measures, and Comparative Case Studies*; Lazzeretti, L., Ed.; Routledge: New York, NY, USA, 2013; p. 328.
25. De Bernardi, P.; Bertello, A.; Venuti, F.; Foscolo, E. How to avoid the tragedy of alternative food networks (AFNs)? The impact of social capital and transparency on AFN performance. *Br. Food J.* **2020**, *122*, 2171–2186. [[CrossRef](#)]
26. Galt, R.; O’Sullivan, L.; Beckett, J.; Hiner, C.C. *Community Supported Agriculture (CSA) in and around California’s Central Valley: Farm and Farmer Characteristics, Farm-Member Relationships, Economic Viability and Emerging Issues*; University of California: Oakland, CA, USA, 2011.
27. Bougherara, D.; Grolleaub, G.; Mzoughic, N. Buy local, pollute less: What drives households to join a community supported farm? *Ecol. Econ.* **2009**, *68*, 1488–1495. [[CrossRef](#)]
28. Brehm, J.M.; Eisenhauer, B.W. Motivations for participating in community-supported agriculture and their relationship with community attachment and social capital. *J. Rural. Soc. Sci.* **2008**, *23*, 5.
29. Cox, R.; Holloway, L.; Venn, L.; Dowler, L.; Hein, J.R.; Kneafsey, M.; Tuomainen, H. Common ground? Motivations for participation in a community-supported agriculture scheme. *Local Environ.* **2008**, *13*, 203–218. [[CrossRef](#)]
30. Hvitsand, C. *Organic Spearhead—The Role of Community Supported Agriculture in Enhancing Bio Economy, and Increased Knowledge about and Consumption of Organic Food*; Title Translated from Norwegian; Telemark Research Institute: Bø, Norway, 2014.
31. Kane, D.; Lohr, L. *The Dangers of Space Turnips and Blind Dates: Bridging the Gap Between CSA Shareholders’ Expectations and Reality*; CSA Farm Network: Stillwater, NY, USA, 1998.
32. Cone, C.; Myhre, A. Community-supported Agriculture: A Sustainable Alternative to Industrial Agriculture? *Hum. Organ.* **2000**, *59*, 187–199. [[CrossRef](#)]
33. Galt, R.E.; Bradley, K.; Christensen, L.O.; Munden-Dixon, K. The (un)making of “CSA people”: Member retention and the customization paradox in Community Supported Agriculture (CSA) in California. *J. Rural Stud.* **2019**, *65*, 172–185. [[CrossRef](#)]
34. Witzling, L.; Shaw, B.R.; Strader, C.; Sedlak, C.; Jones, E. The role of community: CSA member retention. *Br. Food J.* **2020**, *122*, 2289–2302. [[CrossRef](#)]
35. Vitari, C.; Whittingham, E. Tackling Conventional Agriculture: The Institutionalization of Community Supported Agriculture’s (CSA) Principles. In Proceedings of the Research & Degrowth Conference, Malmö, Sweden, 21–25 August 2018.
36. Balázs, B.; Pataki, G.; Lazányi, O. Prospects for the future: Community supported agriculture in Hungary. *Futures* **2016**, *83*, 100–111. [[CrossRef](#)]
37. Nost, E. Scaling-up local foods: Commodity practice in community supported agriculture (CSA). *J. Rural Stud.* **2014**, *34*, 152–160. [[CrossRef](#)]
38. Galt, R.E.; Bradley, K.; Christensen, L.; Van Soelen Kim, J.; Lobo, R. Eroding the Community in Community Supported Agriculture (CSA): Competition’s Effects in Alternative Food Networks in California. *Sociol. Rural.* **2016**, *56*, 491–512. [[CrossRef](#)]
39. Galt, R.E.; Bradley, K.; Christensen, L.; Fake, C.; Munden-Dixon, K.; Simpson, N.; Surls, R.; Van Soelen Kim, J. What difference does income make for Community Supported Agriculture (CSA) members in California? Comparing lower-income and higher-income households. *Agric. Hum. Values* **2017**, *34*, 435–452. [[CrossRef](#)]
40. Galt, R.E.; Bradley, K.; Christensen, L.; Munden-Dixon, K. Exploring member data for Community Supported Agriculture (CSA) in California: Comparisons of former and current CSA members. *Data Brief* **2018**, *21*, 2082–2088. [[CrossRef](#)]
41. Rossi, J.; Woods, T. Understanding shareholder satisfaction and retention in CSA incentive programs. *J. Food Distrib. Res.* **2020**, *51*, 16–40.
42. Darnhofer, I. Farming from a Process-Relational Perspective: Making Openings for Change Visible. *Sociol. Rural.* **2020**, *60*, 505–528. [[CrossRef](#)]
43. Vroom, V.H. Organizational choice: A study of pre- and post-decision processes. *Organ. Behav. Hum. Perform.* **1966**, *1*, 212–225. [[CrossRef](#)]
44. Singh, R. Information integration theory applied to expected job attractiveness and satisfaction. *J. Appl. Psychol.* **1973**, *60*, 621–623. [[CrossRef](#)]
45. Belllet, M.; Colletis, G.; Lung, Y. Économie des proximités. *Rev. D’économie Régionale Urbaine* **1993**, *3*, 357–606.
46. Rallet, A.; Torre, A. Is geographical proximity necessary in the innovation networks in the era of global economy? *GeoJournal* **1999**, *49*, 373–380. [[CrossRef](#)]
47. Moodysson, J.; Jonsson, O. Knowledge collaboration and proximity: The spatial organization of Biotech innovation projects. *Eur. Urban Reg. Stud.* **2007**, *14*, 115–131. [[CrossRef](#)]
48. Coenen, L.; Raven, T.; Verbong, G. Local niche experimentation in energy transitions: A theoretical and empirical exploration of proximity advantages and disadvantages. *Technol. Soc.* **2010**, *32*, 295–302. [[CrossRef](#)]
49. Holloway, L.; Cox, R.; Venn, L.; Kneafsey, M.; Dowler, E.; Tuomainen, H. Managing sustainable farmed landscape through ‘alternative’ food networks: A case study from Italy. *Geogr. J.* **2006**, *172*, 219–229. [[CrossRef](#)]
50. Hayden, J.; Buck, D. Doing community supported agriculture: Tactile space, affect and effects of membership. *Geoforum* **2012**, *43*, 332–341. [[CrossRef](#)]



51. Michel-Villarreal, R.; Hingley, M.; Canavari, M.; Bregoli, I. Sustainability in Alternative Food Networks: A Systematic Literature Review. *Sustainability* **2019**, *11*, 859. [CrossRef]
52. Rossi, A. Beyond Food Provisioning: The Transformative Potential of Grassroots Innovation around Food. *Agriculture* **2017**, *7*, 6. [CrossRef]
53. Parker, G. Social innovation in local food in Japan: Choku-bai-jo markets and Teikei cooperative practices. In *Real Estate & Planning Working Papers*; University of Reading: Reading, UK, 2016.
54. Edquist, C.; Johnson, B. Institutions and organizations in systems of innovation. In *Systems of Innovation: Technologies, Institutions, and Organizations*; Edquist, C., Ed.; Pinter: London, UK, 1997; pp. 41–63.
55. Breschi, S.; Lissoni, F. *Mobility and Social Networks: Localised Knowledge Spillovers Revisited*; CESPRI Working Paper No. 142; University Bocconi: Milano, Italy, 2003. Available online: <https://ideas.repec.org/p/cri/cespri/wp142.html> (accessed on 18 January 2021).
56. Broekel, T.; Boschma, R. Knowledge networks in the Dutch aviation industry: The proximity paradox. *J. Econ. Geogr.* **2012**, *12*, 409–433. [CrossRef]
57. Samoggia, A.; Perazzolo, C.; Kocsis, P.; Del Prete, M. Community supported agriculture farmers' perceptions of management benefits and drawbacks. *Sustainability* **2019**, *11*, 3262. [CrossRef]
58. Hatano, J. The organic agriculture movement (teikei) and factors leading to its decline in Japan. *Rural Food Econ.* **2008**, *54*, 21–34.
59. Kondoh, K. The alternative food movement in Japan: Challenges, limits, and resilience of the teikei system. *Agric. Hum. Values* **2015**, *32*, 143–153. [CrossRef]
60. Hvitsand, C. Community supported agriculture (CSA) as a transformational act—Distinct values and multiple motivations among farmers and consumers. *Agroecol. Sustain. Food Syst.* **2016**, *40*, 333–351. [CrossRef]
61. Rømo Grande, E. Eating is an Agricultural Act: Community Supported Agriculture (CSA) in Norway. Master's Thesis, Norwegian University of Life Sciences, Ås, Norway, 2009.
62. Rømo Grande, E. Norway. In *Overview of Community Supported Agriculture in Europe*; European CSA Research Group: Aubagne, France, 2016; pp. 74–77.
63. Coff, C.; Korthals, M.; Barling, D. Ethical traceability and informed food choice. In *Ethical Traceability and Communicating Food*; The International Library of Environmental, Agricultural and Food Ethics; Coff, C., Barling, D., Korthals, M., Nielsen, T., Eds.; Springer: Dordrecht, The Netherlands, 2008; pp. 1–18.
64. Hofstede, G. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, 2nd ed.; Sage: Thousand Oaks, CA, USA, 2001.
65. Ferrin, D.L.; Gillespie, N. Trust differences across national-societal cultures: Much to do, or much ado about nothing? In *Organizational Trust: A Cultural Perspective*; Saunders, M.N., Skinner, D., Dietz, G., Gillespie, N., Lewicki, R.J., Eds.; Cambridge University Press: Cambridge, UK, 2010; pp. 42–86.
66. Storstad, O. The impact of consumer trust in the Norwegian food market. In *Food, Nature and Society; Rural Life in Late, Modernity*; Blanc, M., Tovey, H., Eds.; Routledge: Abingdon, UK, 2001; pp. 113–134.
67. Wohlmacher, E. Comparing Community Supported Agriculture in Vienna and Vancouver. Master's Thesis, University of Natural Resources and Life Sciences, Vienna, Austria, 2018.
68. Plank, C.; Hafner, R.; Stotten, R. Analyzing values-based modes of production and consumption: Community-supported agriculture in the Austrian Third Food Regime. *Österreichische Zeitschrift für Soziologie* **2020**, *45*, 49–68. [CrossRef]
69. Freyer, B.; Bingen, J. *Re-Thinking Organic Food and Farming in a Changing World*; The International Library of Environmental Agricultural and Food Ethics 22; Springer: Dordrecht, The Netherlands, 2015.
70. Guthmann, J. Regulating meaning, appropriating nature: The codification of California organic agriculture. *Antipode* **1998**, *30*, 135–154. [CrossRef]
71. Devik, A. *Håndbok for å Starte Andelslandbruk*; Oikos–Økologisk Norge: Oslo, Norway, 2015.
72. Organic Norway. Community Supported Agriculture in Norway (Translated). 2020. Available online: <https://www.andelslandbruk.no/english-1/english> (accessed on 18 January 2021).
73. Poças Ribeiro, A.; Harmsen, R.; Feola, G.; Rosales Carréon, J.; Worrell, E. Organising Alternative Food Networks (AFNs): Challenges and Facilitating Conditions of different AFN types in three EU countries. *Sociol. Rural.* **2021**, *61*, 491–517. [CrossRef]
74. Braukmann, I. Potenzial und Grenzen von Community Supported Agriculture als Gegenhegemoniales Projekt. Master's Thesis, University of Vienna, Vienna, Austria, 2015. [CrossRef]
75. McGreevy, S.R.; Akitsu, M. Steering sustainable food consumption in Japan: Trust, relationships, and the ties that bind. In *Sustainable Consumption: Design, Innovation, and Practice*; Genus, A., Ed.; Springer: Cham, Switzerland, 2016; Volume 3, pp. 101–117.
76. Akitsu, M.; Aminaka, N. The development of farmer-consumer direct relationships in Japan: Focusing on the trade of organic produce. In Proceedings of the 4th Asian Rural Sociology Association (ARSA) International Conference, Legazpi City, Philippines, 7–10 September 2010.
77. Hatano, T. *Economy of Organic Agriculture: TEIKEI Networks*; Nihon Keizai Hyoronsha: Tokyo, Japan, 1998.
78. Hatano, T.; Karasaki, T. *CSA, Agriculture for Sharing: Case Studies in US, Europe, and Japan*; Soshinsya: Tokyo, Japan, 2019.

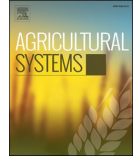
79. Engel, A.; Pabst, S.; Steigberger, E.; Wellmann, L. Austria. In *Overview of Community Supported Agriculture in Europe*; European CSA Research Group: Aubagne, France, 2016; pp. 12–15. Available online: <http://www.fao.org/family-farming/detail/en/c/416085/> (accessed on 18 January 2021).
80. Carifio, J.; Perla, R.J. Ten common misunderstandings, misconceptions, persistent myths and urban legends about Likert scales and Likert response formats and their antidotes. *J. Soc. Sci.* **2007**, *3*, 106–116. [[CrossRef](#)]
81. Field, A.P. *Discovering Statistics Using IBM SPSS Statistics: And Sex and Drugs and Rock 'n' Roll*, 15th ed.; Sage: Chicago, IL, USA, 2013.
82. Kaiser, H.F. The application of electronic computers to factor analysis. *Educ. Psychol. Manag.* **1960**, *20*, 141–151. [[CrossRef](#)]
83. Robinson, J.P.; Shaver, P.R.; Wrightsman, L.S. Criteria for scale selection and evaluation. In *Measures of Personality and Social Psychological Attitudes*; Robinson, J.P., Shaver, P.R., Wrightsman, L.S., Eds.; Academic Press: San Diego, CA, USA, 1991; pp. 1–16. [[CrossRef](#)]
84. Kline, P. *The Handbook of Psychological Testing*, 2nd ed.; Routledge Taylor & Francis Group: London, UK, 1999.



### **III Paper 3**

Hvitsand, C., Raanaas, R. K., Gjøtterud, S., and Nicolaysen, A. M. (2022). 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. *Agricultural Systems*, 199, 103403.





# 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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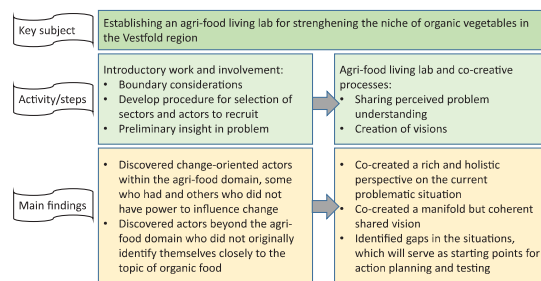
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## HIGHLIGHTS

- 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.

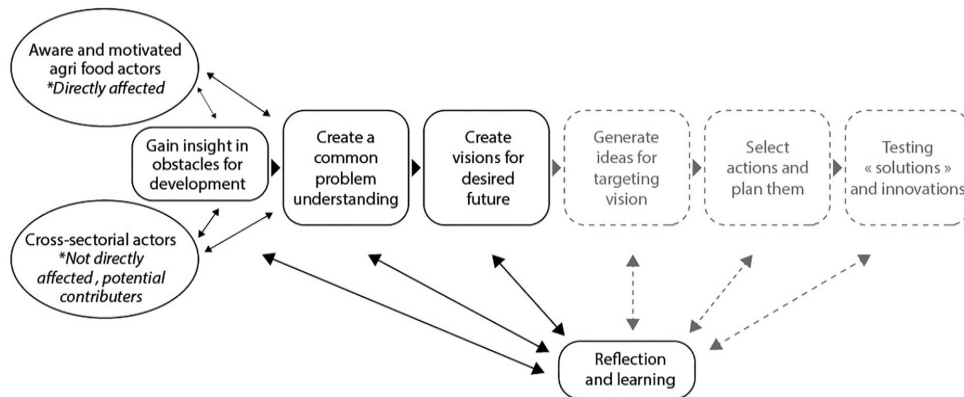
To merge the knowledge from the living lab and action research literature and illustrate the stages of a place-based living lab project, we have designed Fig. 1 (Bulkeley et al., 2016; Greenwood and Levin, 2006; Hvitsand and Richards, 2017; Ison, 2017; Midgley, 2000; Steen and van Bueren, 2017; Wittmayer 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, 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

### Introductory work :

Selection and involvement of actors



### Agri food living lab:

Co creative processes

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).

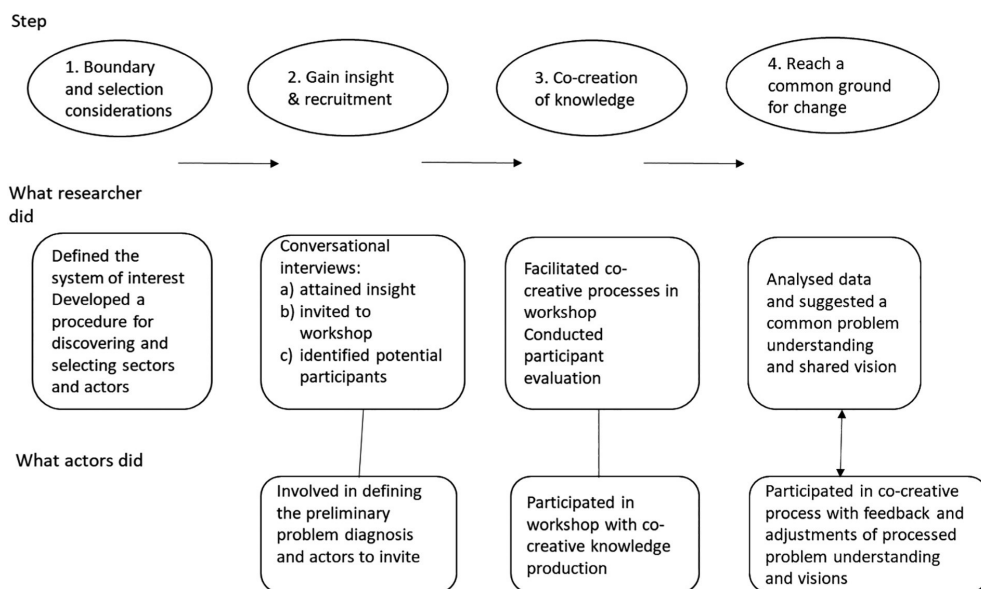


Fig. 2. Activities for establishing the agri-food living lab (steps 1–2 were related to the introductory work, steps 3–4 were related to the co-creative processes).



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)

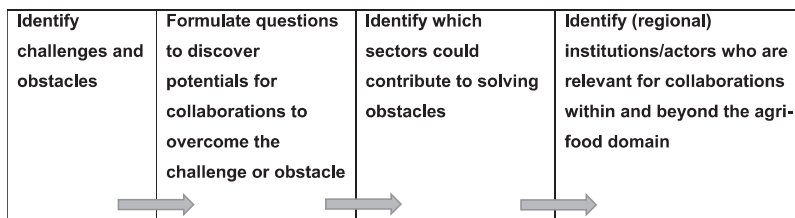
In the next step in the introductory work, we wanted to gain preliminary insight into the situation in the region to lay the foundation for the preparations of the workshop and the co-creative processes (step 3).

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%
Total	48	30	19
<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 (Saldana, 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 "improvement," 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:

Examples of individual notes	Being part of these areas of concern	Emergent topic for change
The market situation, and the groceries' profit, strikes hard on more expensive organic goods (perceived problematic situation)	→ Powerful actors, difficult entrance to market (perceived problematic situation)	↘ Less concentration of power, but instead a
More sales channels give increased availability for consumers and more opportunities for farmers (vision)	→ Local and alternative food systems, seasonal and diverse, increased volume (shared vision)	↗ diversity of chains and markets

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 connectiveness 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.

<b>Challenge/obstacle</b>	<b>Questions to discover potentials for collaboration</b>	<b>Relevant “new” sectors</b>	<b>(Regional) institutions/actors relevant to cross-sectorial collaboration</b>
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

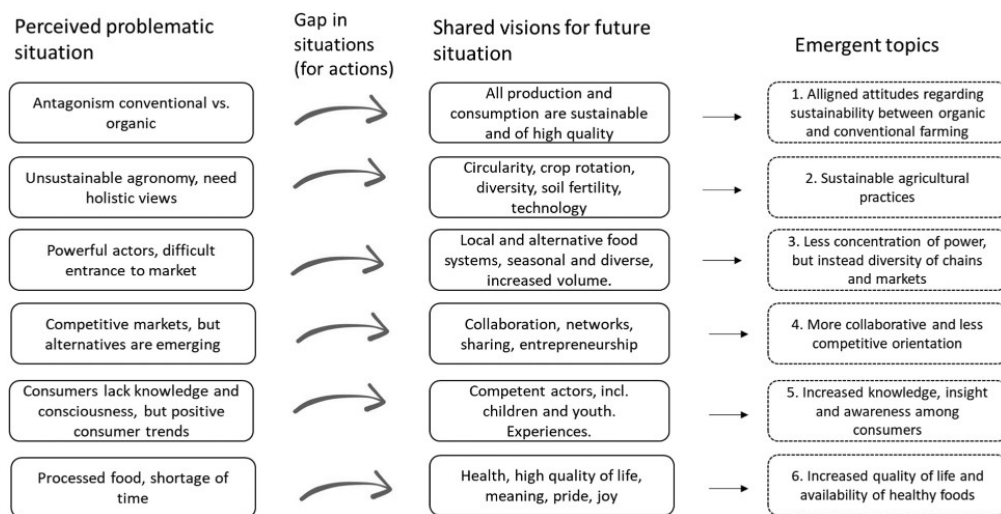


Fig. 4. The perceived problematic situation, the corresponding shared vision for the desired future situation, the gap in situation, and the emergent topics for change.



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 Fêche 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

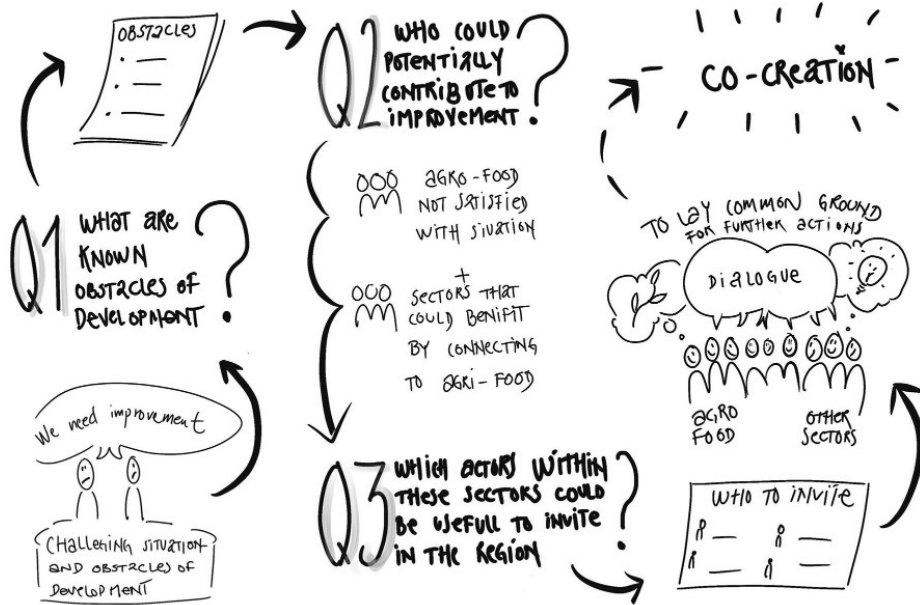


Fig. 5. Illustration of “Procedure for discovering potential cross-sectorial collaborations and actor selection” based on developing a specific niche in a place-based living lab.

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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## References

- Avelino, F., 2017. Power in sustainability transitions: Analysing power and (dis)empowerment in transformative change towards sustainability. *Environ. Policy Gov.* 27 (6), 505–520.
- Bawden, R., 2012. How should we farm? The ethical dimension of farming systems. In: *Farming Systems Research into the 21st Century: The New Dynamic*. Springer, pp. 119–139.
- Bradbury, H., 2015. Introduction: how to situate and define action research. In: *The Sage Handbook of Action Research*, pp. 1–12.
- Bulkeley, H., Coenen, L., Frantzeskaki, N., Hartmann, C., Kronsell, A., Mai, L., Palgan, Y. V., 2016. Urban living labs: governing urban sustainability transitions. *Curr. Opin. Environ. Sustain.* 22, 13–17.
- Chambers, R., 2005. Reversals, institutions, and change. In: Pretty, J. (Ed.), *The Earthscan Reader in Sustainable Agriculture*, pp. 135–147.
- Cuellar-Padilla, M., Calle-Collado, A., 2011. Can we find solutions with people? Participatory action research with small organic producers in Andalusia. *J. Rural. Stud.* 27 (4), 372–383.
- Darnhofer, I., 2014. Contributing to a Transition to Sustainability of Agri-Food Systems: Potentials and Pitfalls for Organic Farming. In: *Organic Farming, Prototype for Sustainable Agricultures*. Springer, pp. 439–452.
- Darnhofer, I., Gibbon, D., Dedieu, B., 2012. Farming systems research: An approach to inquiry. In: *Farming Systems Research into the 21st Century: The New Dynamic*. Springer, pp. 3–31.
- El Bilali, H., 2019. The multi-level perspective in research on sustainability transitions in agriculture and food systems: A systematic review. *Agriculture* 9 (4), 74.
- ENoLL, 2021. *European Networks of Living Labs*. <https://enoll.org/>.
- Feche, R., Nouis, C., Barataud, F., 2021. Building a transformative initiative for a territorialized Agri-food system: constructing a living-lab and confronting norms? A case study from Mirecourt (Vosges, France). *J. Rural. Stud.* 88, 400–409.
- Gamache, G., Anglade, J., Feche, R., Barataud, F., Mignolet, C., Coquil, X., 2020. Can living labs offer a pathway to support local Agri-food sustainability transitions? *Environmental Innovation and Societal Transitions* 37, 93–107.
- García-Lorente, M., Pérez-Ramírez, I., de la Portilla, C.S., Haro, C., Benito, A., 2019. Agroecological strategies for reactivating the agrarian sector: the case of Agrolab in Madrid. *Sustainability* 11 (4).
- Geels, F.W., 2018. Disruption and low-carbon system transformation: Progress and new challenges in socio-technical transitions research and the multi-level perspective. *Energy Res. Soc. Sci.* 37, 224–231.
- Greenwood, D.J., Levin, M., 2006. *Introduction to Action Research: Social Research for Social. SAGE publications, change.*
- Halbe, J., Pahl-Wostl, C., 2019. A methodological framework to initiate and design transition governance processes. *Sustainability* 11 (3), 844.

- Halbe, J., Pahl-Wostl, C., Lange, A., Velonis, C., 2015. Governance of transitions towards sustainable development—the water–energy–food nexus in Cyprus. *Water Int.* 40 (5–6), 877–894.
- Hannevig, I., Parker, M., 2012. *Dialog - a practical guide* (in Norwegian). Flux publisher.
- Hvitsand, C., 2016. Community supported agriculture (CSA) as a transformational act—distinct values and multiple motivations among farmers and consumers. *Agroecol. Sustain.* Food Syst. 40 (4), 333–351.
- Hvitsand, C., Richards, B., 2017. Urban Living Labs - the use in Norway and with examples from Europe (Report in Norwegian). TRI report no. 393. Telemark Research Institute.
- IPES-food, 2016. From uniformity to diversity: A paradigm shift from industrial agriculture to diversified agroecological systems. In: International Panel of Experts on Sustainable Food Systems.
- Isom, R., 2017. *Systems Practice: How to Act: In Situations of Uncertainty and Complexity in a Climate-Change World*. Springer.
- Jackon, M.C., 2006. Creative holism: a critical systems approach to complex problem situations. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research* 23 (5), 647–657.
- Kemmis, S., McTaggart, R., 2005. *Participatory Action Research: Communicative Action and the Public Sphere*. Sage Publications Ltd.
- Kobzeva, M., Knickel, K., 2018. Instead of just talking we are actually doing it!. In: Initial Insights into the Use of Living Labs in the EU-funded ROBUST project.
- Köhler, J., Geels, F.W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Boons, F., 2019. An agenda for sustainability transitions research: state of the art and future directions. *Environmental Innovation and Societal Transitions* 31, 1–32.
- Lamine, C., 2018. Transdisciplinarity in research about agrifood systems transitions: A pragmatist approach to processes of attachment. *Sustainability* 10 (4), 1241.
- Leikvoll, G.K.A., Hvitsand, C., Haugen, I., Engh, M., 2020. REKO Networks: an Important Sales Channel for Organic Farmers? (Report in Norwegian). TRI report no. 3. Telemark Research Institute.
- Leminen, S., Westerlund, M., Nyström, A.-G., 2012. Living labs as open-innovation networks. *Technology Innovation Management Review* (September), 6–11.
- Leventon, J., Fleskens, L., Claringbould, H., Schwilch, G., Hessel, R., 2016. An applied methodology for stakeholder identification in transdisciplinary research. *Sustain.* Sci. 11 (5), 763–775.
- Levin, M., 2012. Academic integrity in action research. *Action Res.* 10 (2), 133–149.
- Levin, M., Ravn, J.E., 2007. Involved in praxis and analytical at a distance. *Syst. Pract. Action Res.* 20 (1), 1–13.
- Loorbach, D., 2010. Transition management for sustainable development: a prescriptive, complexity-based governance framework. *Governance* 23 (1), 161–183.
- Luederitz, C., Schöpke, N., Wiek, A., Lang, D.J., Bergmann, M., Bos, J.J., König, A., 2017. Learning through evaluation—A tentative evaluative scheme for sustainability transition experiments. *J. Clean. Prod.* 169, 61–76.
- McIntyre, B.D., Herren, H.R., Wakhungu, J., Watson, R.T., 2009. *Agriculture at a Crossroads. International Assessment of Agricultural Knowledge, Science and Technology for Development: Global synthesis report*. Island Press, Washington DC.
- McPhee, C., Banczer, M., Mambri-Doudet, M., Chrétien, F., Huyghe, C., Gracia-Garza, J., 2021. The defining characteristics of agroecosystem living labs. *Sustainability (Switzerland)* 13 (4), 1–25.
- Meynard, J.-M., Jeuffroy, M.-H., Le Bail, M., Lefèvre, A., Magrini, M.-B., Michon, C., 2017. Designing coupled innovations for the sustainability transition of agrifood systems. *Agric. Syst.* 157, 330–339.
- Midgley, G., 2000. *Systemic Intervention: Philosophy, Methodology and Practice*. Kluwer Academic. Plenum Publishers, New York, Boston, Dordrecht, London, Moscow.
- Milford, A.B., Kårstad, S., Pettersen, I., Prestvik, A.S., Storstad, O., 2016. Bottlenecks and Opportunities in the Value Chain for ORGANIC fruit, Berries and Vegetables (in Norwegian). NIBIO report Vol 2, No. 36. NIBIO.
- Milford, A.B., Prestvik, A.S., Kårstad, S., 2019. Production and sales of organic fruit, berries and vegetables through alternative markets (in Norwegian). In: NIBIO report vol. 5, no. 95. NIBIO.
- Ministry of Agriculture and Food, 2011. *White paper no. 9* (2011–2012) About the Agriculture and Food Policy. Welcome to the table.
- Muller, M.O., Groesser, S., Ulli-Beer, S., 2012. How do we know who to include in collaborative research? Toward a method for the identification of experts. *Eur. J. Oper. Res.* 216 (2), 495–502.
- Norwegian Agriculture Agency, 2019. *Production and Sale of Organic Food Products. Report for 2018* (in Norwegian).
- NOU 2011:4. *Official Norwegian report 2011:4. Food, power and powerlessness (in Norwegian). Ministry of Agriculture and Food.*
- Pigford, A.-A.E., Hickey, G.M., Klerkx, L., 2018. Beyond agricultural innovation systems? Exploring an agricultural innovation ecosystems approach for niche design and development in sustainability transitions. *Agric. Syst.* 164, 116–121.
- Pool, A., Parker, M., 2017. *Creating Futures that Matter Today. Facilitating Change through Shared Vision*. Executive Savvy, Durango, CO, USA.
- Rickerl, D., Francis, C., 2004. Multidimensional thinking: a prerequisite to agroecology. *AGRONOMY* 43, 1–18.
- Rigby, D., Cáceres, D., 2001. Organic farming and the sustainability of agricultural systems. *Agric. Syst.* 68 (1), 21–40.
- Rittel, H.W., Webber, M.M., 1973. 2.3 planning problems are wicked. *Polity* 4 (155), e169.
- Saldaña, J., 2016. *The Coding Manual for Qualitative Researchers*. Sage.
- Senge, Kleiner, A., Roberts, C., Ross, R., Roth, G., Smith, B., Guman, E.C., 1999. *The dance of change: the challenges to sustaining momentum in learning organizations*. *Perform. Improv.* 38 (5), 55–58.
- Senge, Scharmer, C.O., Jaworski, J., Flowers, B.S., 2005. *Presence: An Exploration of Profound Change in People, Organizations, and Society*. Crown Business.
- Serikstad, G.L., 2016. *Producer Collaboration on Crop Rotation for Increased Organic Vegetable Production (in Norwegian)*, vol. 1/NR. NORSØK, p. 6.
- Skjelvik, J.M., Bruvoll, A., Erlandsen, A.M., 2017. Evaluation of the endeavor for pilot counties regarding the development of organic agriculture (in Norwegian). Report no. 2017/01. Vista Analyse.
- Smith, A., Raven, R., 2012. What is protective space? Reconsidering niches in transitions to sustainability. *Res. Polity* 41 (6), 1025–1036.
- Steen, K., van Bueren, E., 2017. The defining characteristics of urban living labs. *Technol. Innov. Manag. Rev.* 7 (7).
- Thompson, J., Millstone, E., Scoones, I., Ely, A., Marshall, F., Shah, E., Wilkinson, J., 2007. *Agri-Food System Dynamics: Pathways to Sustainability in an Era of Uncertainty*. (STEPS working paper 4).
- Turner, J., Horita, A., Fielke, S., Klerkx, L., Blackett, P., Bewsell, D., Boyce, W., 2020. Revealing power dynamics and staging conflicts in agricultural system transitions: case studies of innovation platforms in New Zealand. *J. Rural. Stud.* 76, 152–162.
- Ulrich, W., 2005. A Brief Introduction to Critical Systems Heuristics (CSH). ECOSENSUS project site.
- Vidal, R.V.V., 2004. The vision conference: facilitating creative processes. *Syst. Pract. Action Res.* 17 (5), 385–405.
- Wittmayer, J.M., Schöpke, N., 2014. Action, research and participation: roles of researchers in sustainability transitions. *Sustain. Sci.* 9 (4), 483–496.
- Yin, R.K., 2013. *Case Study Research: Design and Methods*. SAGE Publications.
- Zavratnik, V., Superina, A., Stojimenova Duh, E., 2019. Living labs for rural areas: contextualization of living lab frameworks, concepts and practices. *Sustainability* 11 (14), 3797.



## **IV Paper 4**

Hvitsand, C., Nicolaysen, A. M., Gjøtterud, S., and Raanaas, R. K. (XXXX). Forces and tensions influencing the viability of a co-created Alternative Food Network in Norway. *Manuscript in review process in journal.*



# Forces and tensions influencing the viability of a co-created local and alternative food network in Norway

## Abstract

Sustainability challenges in agri-food systems are complex made worse by lock-ins to the current agri-food situation. A need exists for greater knowledge for guidance in shifting into more sustainable development paths, for example, by experimenting with niche-innovations. The alternative food network *Green Parallel* was co-created through action research in an agri-food living lab to contribute to the realization of more localized food systems for organic vegetables in the Vestfold region in Norway. The initiative involved organic farmers and professional buyers, such as specialty stores, chain retailers, public and private canteens, and restaurants, and was piloted during 2019 and 2020. The objectives of the present action research were to contribute to improving the specific situation and to obtain greater knowledge regarding the existing tensions and forces that support or hinder the viability of niche-innovations.

The main methods of data collection were interviews and reflection notes written by the coordinator and the researcher during the piloting. We utilized perspectives from field theory, multi-level perspective (MLP), and institutional economy to understand individual behaviors in relation to the internal and external niche forces and tensions.

Although the initial motivation to collaborate was a strong supportive force, we identified the following five tensions and forces affecting the viability of Green Parallel: 1) divergence between what the farmers deliver and what buyers request; both are in need of predictability, 2) a need for more contact between producers and buyers, but who is responsible for taking the initiative?, 3) the inability of small-scale organic farmers to compete with “local food,” 4) the importance of personal engagement of the purchasers to explore and “push” the room to maneuver, and 5) the difficulty in moving from individual to collective thinking; trust and commitment are crucial elements, but economy often decides.

We found that these forces work through complex interdependencies within individuals and actor types and across actor types, as well as across internal and external niche spans. The forces reinforce each other and can generate either upward or downward spirals. The study shows how these forces play out from the perspective of the individuals involved, including the struggles stemming from Green Parallel’s inherent intersection with regime and market forces.

Key words: organic vegetables, professional buyers, agri-food systems transition, collective action, experimenting, engaged research

## 1. Introduction

The complexity of sustainability challenges in agri-food systems, with lock-ins to the current situation, creates difficulties when attempting to shift to more sustainable development paths (IPES-food, 2016). The lock-ins are related to policies and practices, such as specialized industrial agriculture; large-scale retailers who prefer bulk supply contracts; the expectation of cheap, abundant, and standardized food; the globalized food markets; the physical, economic, and cognitive disconnection between consumers and producers; and the focus on short-term economic and productivity gains. The concentration of power in large-scale agri-food businesses, organizations, and long value chain actors is reinforcing these lock-in mechanisms and causing resistance to alternative models (see also Avelino (2017)). Rules, norms, and routinized and habituated behavior can prevent reasoning about and acting upon alternative directions (Vatn, 2015). The notions of individualism, rational thinking, and competition in markets permeate how our societies function, thereby affecting our decisions and thinking about sustainability (Feola, 2020; Vatn, 2015).

According to the multi-level perspective (MLP) (Schot and Geels, 2008), we call these described structures the agri-food *regime*. Situations with lock-ins are maintained through the existing technical and societal structures of regimes, while pressure from *niches* representing sustainable and radical innovations, and from the *landscape* (the broader economic and societal environment, such as trends) can enhance sustainability transitions. Niches can be shielded, nurtured, and empowered in “protected spaces,” but the internal processes in niches need to be seen in context with broader external forces and processes (Schot and Geels, 2008; Smith and Raven, 2012). The present research explores the tensions and forces that occur when piloting a co-created niche-innovation that, by design, intersects with regime contributing to a more pluralized depiction of regime actors (Turnheim and Sovacool, 2020).

Both organic farming and alternative food networks (AFNs) are regarded as niches that are assumed to represent more sustainable development paths in agri-food systems (El Bilali, 2019). Organic farming relates to *how the food is produced*, whereas AFNs relate to *how farm products reach the market*, so they encompass more direct producer–consumer relationships in short food supply chains and local food systems (IPES-food, 2016). AFNs are usually initiatives based on certain values, such as

environmentally sustainable or organic production and fair income for farmers (Hvitsand, 2016; Renting et al., 2003; Seyfang and Smith, 2007). However, “local food systems” or “local food” do not inherently entail organic or sustainable production, as the purchase of local food could instead be motivated by a desire to support local farmers and the local economy or to obtain access to fresh food (Leikvoll et al., 2020; Winter, 2003). Related to this, a conflation of local production and organic/ecologically sound production often occurs in buy-local campaigns (Born and Purcell, 2006; Tregear, 2011)

In the development of AFNs, multiple organizational and logistical barriers arise that require collaborative and collective approaches regarding knowledge development and actions to develop new markets (Hvitsand et al., 2022; Kneafsey et al., 2013; Poças Ribeiro et al., 2021). However, niche-initiatives require particular skills and engaged individuals, as well as supportive contextual factors, such as a variety of resources (Seyfang and Smith, 2007). The challenge is to survive and be resilient to cuts in funding, departures of key people, shifts in policy, etc. Building mutual trust, shared goals, and relational connectedness among participants are highlighted as crucial (De Bernardi et al., 2020; Gugerell et al., 2021), especially when expanding in volumes and into regime actors (Lamine and Noe, 2018). This necessity is supported by the findings of Rossi (2017), who also highlights that collective learning and network agreements play a role. Engagement and endured commitment among buyers are regarded core requirements (De Bernardi et al., 2020), including consumer groups, such as parents engaging in local food supply to schools (Bui et al., 2016). Transparency, information flows, and direct contact are also important for continued purchases (Bui et al., 2016; De Bernardi et al., 2020).

Organic farming can be stimulated by increased demand for locally produced organic products from public entities and retail (Bui et al., 2016; Ingram, 2015; NOU 2011:4; Poças Ribeiro et al., 2021). However, long value chain actors impose requirements, such as the uniformity and cosmetics of products, large volumes, and low prices (Doernberg et al., 2016; Lefèvre et al., 2020; Milford et al., 2021). Such requirements are contrary to those of AFNs, where there is a greater acceptance for non-uniform products and where more small-scale diversified farms operate. Niches and regimes are in dynamic interrelations (Darnhofer, 2014; Elzen et al., 2012; Ingram, 2015). Audet et al. (2017) found that these intersections create tensions that impede sustainability transitions because niches are subject to the rules of the regime in their everyday operations.

When searching for literature regarding organic food through alternative food networks and local markets, we found an abundance of studies anchored in agriculture or from the producer perspective (Darnhofer, 2014; Diaz et al., 2013; El Bilali, 2019; Kneafsey et al., 2013). Furthermore,

consumer perspectives are mainly anchored in those of individual consumers (e.g., De Bernardi et al., 2020; Hvitsand, 2016), although some studies have focused on perspectives from retailers (e.g., Doernberg et al., 2016; Lamine and Noe, 2018), public entities (e.g., Bui et al., 2016), and restaurants (e.g., Shafieizadeh and Tao, 2020). We found fewer studies on AFNs that involve *professional buyers*, which we defined as those purchasing food items to sell or serve to consumers (i.e., different stores and places serving food). This definition of professional buyers means that they can belong to either niche or regime.

The described complexity of the agri-food situation and the transition processes imply a need to take systemic and participatory approaches – across production and consumption lines and sectors – for establishment of holistic innovation processes and increased understanding of the challenges and opportunities of niche–regime interactions (Darnhofer et al., 2012; El Bilali, 2019; Köhler et al., 2019; Meynard et al., 2017). This requires studies that disentangle the experiences of the different actors involved and uncover the tensions between alternative and conventional systems (Poças Ribeiro et al., 2021).

### **1.1. Experimenting with sustainable solutions through action research**

Studying local projects and experiments can help us understand how changes and transitions can take place (Elzen et al., 2012; Klerkx et al., 2010). A need exists for research on new ways to collaborate and co-create knowledge and innovations and to experiment with these in real-life settings (Schot and Geels, 2008). Place-based living labs can respond to this need and be applied to address sustainability challenges in specific contexts (Bulkeley et al., 2016), such as agri-food contexts (Fèche et al., 2021; Gamache et al., 2020). These labs are locally based initiatives that function as platforms and arenas for fostering innovations through co-created knowledge, actions, and experimentation with sustainable solutions. In these “sustainability transition experiments,” the creation of awareness, trust, commitment, ownership, and accountability for collective action toward a common vision or goal is considered important, as is securing transparency, legitimacy, and financial support (Luederitz et al., 2017).

Innovation processes related to entrepreneurial action pose many uncertainties for those involved (Meijer et al., 2007). A continued reassessment of the balance between perceived uncertainties and the motivation influencing the actors’ decision to act takes place. These uncertainties can be both external and internal to a project (i.e., the niche-innovation) and are closely interrelated. Collective activities, such as AFNs, invoke uncertainties regarding the actions of others and require a shift of mentality from individual thinking to reciprocity and decision-making related to the best approach to take for the group (Vatn, 2015).

Concerning sustainability transitions, an increased understanding of the capacity and capability for actors to change their behavior (i.e., their agency) (this applies to both niche innovators and those required to change their everyday behavior) will enhance the likelihood of longer-term success of any transitions (Huttunen et al., 2021). The use of participatory approaches through action research is assumed to empower those involved through the development of knowledge and action. This process often starts with some form of dissatisfaction as a motivation for change (Greenwood and Levin, 2006). According to Lewin's "field theory," any proposal for change has different, and interdependent, forces that drive or resist the changes as perceived by the persons involved in the change situation (Burnes and Cooke, 2013; Schein, 1996). The behavior of the group in the change situation depends on the interaction between the persons and their environment, and the forces can work in opposite directions and create interpersonal conflicts. The sum of the forces is likely to maintain the current behavior of a person or group (i.e., the situation called the "quasi-stationary equilibrium"). If the involved persons themselves invent a solution for change, and then have a period of trial and error, the change will have a better chance of becoming lasting (Schein, 1996).

Field theory represents an interesting perspective for understanding individual behavior and can be applied when discussing experimenting with a co-created innovation, as is the case in this study.

### 1.3 The Norwegian context

In Norway, only 4.2 percent of the agricultural land is used for organic production, even though organic farmers receive additional subsidies (Norwegian Agriculture Agency, 2020). Small-scale, diversified, organic vegetable farmers can apply for start-up grants through the governmental entity Innovation Norway, and development projects can apply for diverse governmental funds.

The consumption of organic food in Norway is also small, and a large share of organic vegetables and fruits is imported (Norwegian Agriculture Agency, 2020). According to a survey referenced by the Norwegian Agriculture Agency (2020), consumers generally trust Norwegian agriculture, retail stores, and institutions overseeing food issues. Hence, consumers only moderately perceive organic farming as safer and more environment- and animal-friendly than conventional farming (Kvakkestad et al., 2018). These perceptions are further strengthened by the promotion of Norwegian-produced food through the labeling *Enjoy Norway* initiated by the government (Richards et al., 2013; Vittersø and Tangeland, 2015). Nevertheless, criticism has been raised regarding the situation in which a few large-scale actors dominate the food value chain (NOU 2011:4). These actors operate in vertical collaborations and ownerships regarding food production, wholesaling, processing, distribution, purchasing, and retailing. This concentration of power is argued to have consequences for what is ultimately produced and offered to buyers and for the distribution of profit. In addition, it creates

difficulties for alternatives to emerge. These actors also deliver to professional buyers, such as public canteens and institutions, hotels, restaurants, and others. In Norway, most schools do not serve school lunches, and schools purchase food that is mainly sold in canteens to students who do not bring their own food (although bringing packed food is the norm).

Consumers are increasingly concerned about food wastage and eating greater amounts of healthy, organic, local, seasonal, and plant-based food (Bugge, 2015). Alternative food networks (AFNs), such as Farmer's market, Community Supported Agriculture, and, in recent years, REKO (abbreviation for Rejäl konsumtion - fair consumption in English) networks, have emerged in response, and these AFNs also help to meet small-scale producers' needs for more sales channels (Hvitsand, 2016; Leikvoll et al., 2020). Challenges for the further development of organic production and consumption and for alternative channels are related to market uncertainties, the varying availability of produce, and the need for organized information and collaboration regarding logistics (Hvitsand et al., 2022; Milford et al., 2016; Milford et al., 2019).

The present action research took place in the Vestfold region, the site of a large share of domestic vegetable production, including organic production. In the years 2010–2018, the County Governor's agricultural department conducted a project as a "national pilot county" with the goal of increasing production and market development for organic vegetables (Skjelvik et al., 2017). The department was supportive of the present activities and research, which was initiated by the Norwegian University of Life Sciences (NMBU). A temporary agri-food living lab was established winter 2017/2018 for the purpose of strengthening the agri-food systems for organic vegetables in the region. The local food system of "Green Parallel" (Grønn Parallell) emerged through co-creative processes in this lab. (See Hvitsand et al. (2022) for insight into the establishment of the living lab, including the previous endeavors by the County Governor in this field.)

In Norway, work inclusion is enhanced through various labor market measures assigned by the Norwegian Labor and Welfare Administration (NAV). Some initiatives, such as Green Care, have been established for collaboration between agriculture and inclusion. The present study also sought to utilize these links to create win-win situations both for agri-food challenges, by potentially lowering labor costs, and for work inclusion challenges, by engaging in meaningful work and competence development (as in Fèche et al. (2021) and Hvitsand et al. (2022)).

## 1.4 Objective and research questions

The overall aim of this action research was to contribute to strengthen more localized food systems for organic vegetables in the Vestfold region and to obtain more knowledge about transition processes in agri-food systems. The part of the study presented here will explore the occurring



tensions and forces that can support or hinder the development and sustainment of alternative food networks, as seen from different actors' perspectives.

The research question is: *Which forces and tensions hinder or support the viability of a co-created alternative food network consisting of organic vegetable producers and professional buyers?*

The study investigates how Green Parallel, as a co-created alternative food network, performed when put into real life and piloted for two seasons (2019 and 2020). We posit that viability was influenced by a diversity of internal and external forces, which we have identified. As we will show, these forces were closely entangled and could lead to tensions and reinforce upward or downward spirals of development. To understand and discuss the interactions, tensions, and forces that hindered or supported the initiative's development toward the visions and expectations, we draw on a variety of theoretical perspectives, primarily the multi-level perspective, institutional economy, action research, and field theory.

## 2. Methodology

In this section, we describe the research strategy and the emergence and experimenting with Green Parallel, as well as the methods used for data collection and analysis.

### 2.1. Research strategy and emergence of Green Parallel

This study was part of an action research PhD project at the Norwegian University of Life Sciences (NMBU) involving change-oriented actors in cyclic processes of knowledge creation and action (Greenwood and Levin, 2006). The overall aim of the project was to facilitate and analyze participatory processes for strengthening agri-food systems of organic vegetables in the Vestfold region in Norway. The action research, framed as a temporary agri-food living lab, was initiated in winter 2017/2018 with the aim of co-creating innovations following a place-based living lab approach (Hvitsand et al., 2022). The first steps consisted of selecting actors, creating a common problem understanding and shared vision for the desired future, generating ideas and planning actions, and experimenting with "solutions" and innovations. Reflection, learning, and adjustments were crucial in all steps.

This process enabled the co-creation of an alternative food network (AFN) termed *Green Parallel*. This was an infrastructure for a local food system consisting, at the core, of an ordering scheme and transportation of locally produced organic vegetables and other organic products to professional buyers organized by a coordinator. This study focuses on what was learned from experimenting with Green Parallel in the 2019 and 2020 seasons. The researcher (the first author) organized seven workshops from February 2019 to December 2020 to facilitate the creation, planning, and

development of Green Parallel. Figure 1 illustrates the timeline and alternation between workshops, in-between activities, and data collection during the piloting (reflections on observations) and at the end (interviews).

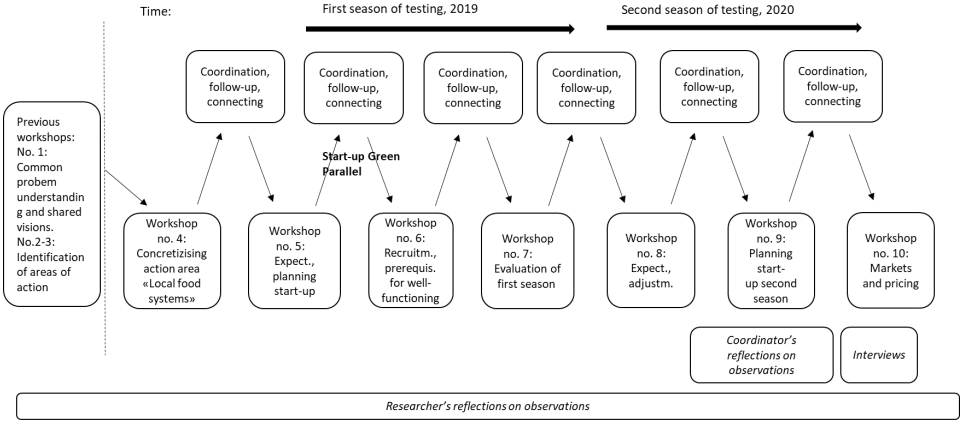


Figure 1: Timeline for workshops, in-between activities (by the coordinator) and data collection from observations by the coordinator and researcher, and finally interviews (see section 2.2.)

In the workshops, the participants (represented by producers, professional buyers, the coordinator, the transporter, and County Governor employee) worked with questions targeted toward strengthening Green Parallel. The questions were related to the creation of expectations of and ideals for Green Parallel, prerequisites for it to be well-functioning and attractive, and obstacles for realizing the expected outcome. In some workshops, the participants were free to choose the topics to be discussed, while in most, the researcher decided the main questions but development of the dialogue was based on the participants’ concerns. The participants co-created knowledge about the evolving situation, made decisions (in some cases), and constructed action plans with assigned responsible persons in response to what was needed for Green Parallel to develop in the desired direction. Participants who had committed to tasks were asked to give updates (about web page work, calculation of transportation costs, etc.) to the other workshop participants at the next workshop.

The researcher had an “outsider” role (Greenwood and Levin, 2006), where the aim of the action research was to create possibilities for those (potentially) involved in the region. For this reason, the researcher did not actively take part in conducting the action plans and only occasionally engaged in the follow-up on the participants’ plans, thereby keeping an analytical distance from the initiative (Levin and Ravn, 2007). Nevertheless, the researcher applied for funds for the piloting on behalf of the involved actors.

## 2.2. Experimenting with Green Parallel

The piloting of Green Parallel was granted external financing from the County Governor's agricultural department and the Norwegian Agriculture Agency, thereby strengthening the practical and research-related activities. The project was administrated by Telemark Research Institute (being lead by the same researcher as affiliated to the university, i.e., the first author). Collaborative partners were the County Governor's agricultural department and Matvalget ("Food Choice," an entity with governmental support that conducts cooking courses and offers advice on the procurement of local and organic food). Included in the grants were the work of the researcher, the coordinator, cooking courses by Matvalget, and economic compensation for producers/buyers doing tasks on behalf of the collective interests. The transportation costs were covered by the producers in the first season to get started but were shared in the second season between the producers and buyers (40/60), based on driven kilometers. The transportation task was conducted by a work inclusion and training entity linked to the NAV; a solution the participants appreciated because the task of transportation could be linked to training and educational activities, thereby lowering the transportation costs.

Altogether, 11 producers and 16 buyers participated in Green Parallel as producers or purchasers, either once or on a regular basis. Some only participated in the first season, while others only participated in the second season.

The participating farms are small-scale and organic, and most already utilized different direct sales channels, such as farm shops, Community Supported Agriculture, and lately, REKO networks, and several offered farm visits. The producers offered organic vegetables, dairy products, eggs, fruit, berries, and grain products through Green Parallel. The overall project and workshops revealed that the producers were motivated to collaborate on transportation and sales work due to a need to develop local markets, as this would allow more time for food production and other farm tasks. The farmers expected that Green Parallel would improve the connection to buyers and enable a decent income through the valuation of their products and higher sales.

The buyers were local professional buyers (not individual consumers), such as specialty stores, "merchant-owned" chain retails, private and public canteens, and restaurants. Some of these had occasionally bought from a few of the farmers before Green Parallel started. Their experience was that their customers were increasingly requesting local sustainable and/or organically produced food, and they saw Green Parallel as a means to access these foods. They appreciated that Green Parallel enabled them to order from several local producers through one scheme.

The goods were paid for directly to the producer by the buyer. The ordering system was manual and arranged through a coordinator, who was paid by the external funding. Every week, the coordinator

asked the farmers for lists of products they had for sale, and the coordinator passed a complete list to potential buyers. The coordinator then passed the complete list of orders back to each producer and a driving route to the transporter. The coordinator often made direct contact with producers and buyers, including potentially new ones, and contributed to workshop organizing. In the first season, the coordinator was one of the farmers, although the researcher organized the first couple of weeks of piloting to assist with the practical parts in the very beginning. In the second season, none of the farmers had time to take on the coordinator role; therefore, a person outside the value chain filled this role. This was a person who identified with the visions behind Green Parallel and knew the field. An information sheet and a Facebook page were created; otherwise, the marketing was done through informal networks and direct outreach work (i.e., low tech and low budget).

The transporter picked up goods on the way south and delivered them on the way north (a distance varying from 70–140 km), bringing back reusable packages and boxes. The fetching and delivery were mainly on the doorstep, but some producers and buyers had to come to pick-up points.

The participants had the ambition that they, during the experiment period, would find an organizational and financial model that would enable Green Parallel to become economically sustainable over time without project grants. However, throughout the piloting period, the collaboration functioned as an informal network and was not formalized organizationally or through other agreements. The participants did not express any expectation or aspiration to formalize the collaboration, although the question was raised by the researcher.

Two external developments substantially influenced Green Parallel during the second season of piloting. The first was the COVID-19 pandemic, which caused restaurants and canteens to shut down or have limited activity. The dependency on foreign (cheaper) labor in Norwegian agricultural production, especially vegetable production, became clear when the country's borders closed. The consequence was that Green Parallel producers also had to conduct larger parts of their farm work themselves, which influenced their ability to engage in and focus on Green Parallel as a collective project. Second, the emergence of REKO networks in Norway has opened up more market opportunities for farmers. REKO is a direct sales channel for consumers, with a great demand for vegetables and fruits, including organic produce (Leikvoll et al., 2020).

## 2.2. Methods and data collection

We utilized the following data sources to answer the research questions:

### ***Reflections by the coordinator and participants***

The coordinator obtained hands-on experience regarding the practical functioning of the scheme and the collaboration. The coordinator utilized this experience to identify tensions and forces by regularly writing notes about activities and reflecting on experiences. The researcher had pre-formulated questions concerning recruitment activities and experiences from the weekly ordering and transport; these included the interactions between involved parties, which disagreements came up and how these were handled, what seemed to contribute to success, and what were barriers. The coordinator wrote notes almost weekly during the 2020 season. The workshop participants at two of the workshops were also invited to provide anonymous evaluations of the workshop and were asked to write openly on post-it notes what they liked and what they would have done differently regarding the workshops.

**Reflections by the researcher**

The researcher’s contact with the Green Parallel participants occurred mainly in the workshops. In between workshops, the researcher observed how the planned actions were followed up, the interaction between participants, and, generally, how the participants related to Green Parallel. This insight was gained by reflecting with the coordinator, receiving copies of sales and orders through the scheme, following Facebook pages and other online resources, and generally having contact with the field (such as receiving emails). The researcher wrote notes based on observations during and between workshops and included reflections on what factors and forces seemed to support or hinder the collaboration and viability of Green Parallel.

**Semi-structured interviews**

Toward the end of the pilot period, the researcher conducted interviews with the various actors involved. The purpose was to collect experiences from the piloting and to engage the interviewees in reflections about these experiences. The chosen interviewees represented the breadth of participants among producers/buyers and among those with continuous/little engagement. In total, persons representing 19 entities were interviewed; 17 interviews were conducted in person, and 2 were online. Two persons from the same entity participated in 6 of the interviews; therefore, 25 persons were interviewed in total. Table 1 lists the methods and data collection including the interviewees. The in-person interviews took place at the farm, in the restaurant, etc.

Table 1: Methods and data collection

Method	Data collection
Reflections by coordinator	Regularly activity and reflection notes from the second season of piloting
Reflections by researcher	Reflection notes from all seven workshops, and in between them
Semi-structured interviews	<u>Number of interviews per entity type:</u> 5 with small-scale organic farmers

	1 with a large-scale organic/conventional farmer 2 with managers at specialty stores 2 with other independent local retailers 1 with a manager at a chain retail 1 with a kitchen chef at a restaurant 3 with public entities (kitchen chefs, chefs teacher, etc.) 1 with 2 employees at the County Governor’s agricultural department 1 with 2 employees at Matvalget (Food Choice) 1 with the driver at the work inclusion entity 1 with 2 employees at the work inclusion entity (kitchen chef and manager)
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The interview guides for producers, buyers, and others were based on experiences and observations from the piloting, as reflected in the notes by the researcher and coordinator. The questions were formulated to obtain insight into forces supporting and hindering the viability of Green Parallel, such as what influenced motivations for participating or not participating in the scheme, prerequisites for selling and buying, the practical functioning of the scheme, the degree of ownership and commitment, the understanding of roles, and the perceived room to maneuver.

The notes written by the researcher during the interviews were digitalized. Most interviews were audio recorded, and the records were used for verification and elaboration of notes and for extraction of quotes.

**2.3. Data analysis**

The analysis was inspired by field theory as a way of understanding the supportive and hindering forces responsible for changes in behavior directed toward reaching a vision or goal (c.f. Lewin in Burnes and Cooke (2013)).

Through the interviews, we obtained data in which the actors explicitly expressed their views, while the reflection notes provided data about observations and how we interpreted what was of importance for Green Parallel. Other data from Green Parallel workshops were indirectly utilized as correction, support, and enrichment in the interpretation of the main data sources. Thus, we sought to secure high rigor by triangulating different methods and sources of data (Yin, 2013) while remaining aware of factors that support high rigor and trustworthiness in action research (Levin, 2012).

We conducted a thematic analysis in which the identification of forces and tensions was based on an inductive and open approach (Braun and Clarke, 2006). Excerpts from the interviews with producers and buyers, as well as the reflection notes, were first analyzed separately. The first author did an initial sorting and coding, separating the perspectives of the different actor types. Based on this, the

researcher searched for connected themes across the actor types to identify cross-cutting tensions that could support or hinder development. The first outset was subject to reflections among the authors and then moved back for restructuring – this being done in several cycles. Due to resource and time limitations, both among participants and researchers, the participants did not take part in this process, except for the coordinator giving feedback and elaborations on the research report. The identified tensions and forces were discussed and conceptualized by abduction in relation to existing theory and knowledge (Tjora, 2021).

Figure 2 illustrates how Green Parallel is a niche-innovation – a response to achieving articulated visions and expected outcomes based on a need for change (Hvitsand et al., 2022). According to field theory, the development or success of an intervention depends on the strengths of the supportive and hindering forces that the individuals experience (i.e., the force field (Burnes and Cooke, 2013)). We found that an understanding of forces as “external” or “niche-internal” was useful for a better understanding, disentanglement, and discussion of the closely interconnected forces and tensions, although the actors were not asked to do this type of separation. We define “external forces” as those related to landscape and agri-food regimes and “niche-internal forces” to include forces occurring within the group or a person in the group, as inspired by the multi-level perspective’s concepts of landscape, regime, and niche levels (Schot and Geels, 2008).

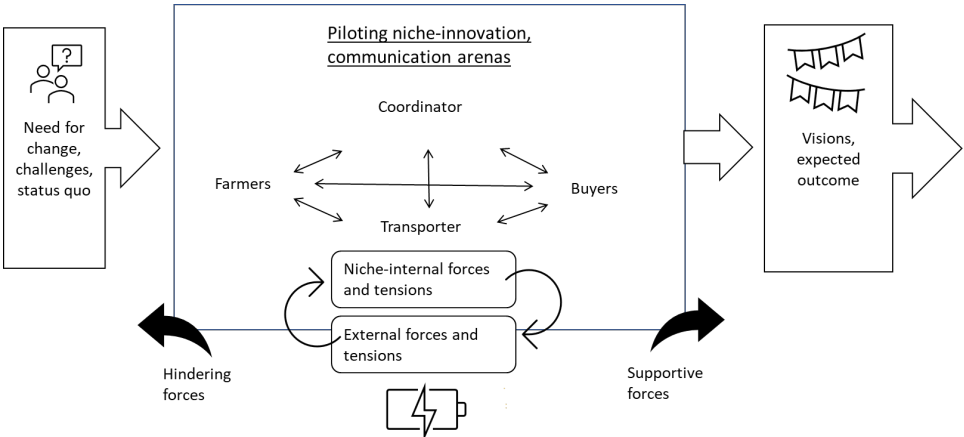


Figure 2: Conceptualization of the research problem

### 3. Results

In this section, we present the findings about tensions that supported or hindered the development of Green Parallel toward what was envisioned and expected, as summarized in Table 2. The motivation for collaborating, as a strong initial supportive force, is shown in Section 2.1. and 2.2.

Table 2: Overview of themes and sub-themes of tensions and forces across actors and levels

Themes	Sub-themes where relevant
1. Divergence between what the farmers deliver and what buyers request, but both are in need of predictability	<p>1.1. Buyers expected predictability of availability and selection of products, and producers expected predictability of and higher sales</p> <p>1.2. Most buyers found the products to have high quality, but the chain retail struggled to sell non-uniform products</p> <p>1.3. Dilemmas arose regarding the level of convenience of transportation, and frustrations arose regarding uncertainties in transportation costs and invoicing</p>
2. Crucial with more contact between producers and buyers, but who is responsible for taking the initiative?	<p>2.1. The producers and buyers had different views regarding who visits whom</p> <p>2.2. Buyers expected the producers to be more directly in touch to communicate about their products</p>
3. Small-scale organic farms cannot compete with “local food”	
4. Personal engagement of purchasers is core to explore and «push» the room to maneuver	
5. Difficult to move from individual to collective thinking; trust and commitment are crucial elements, but economy often decides	<p>5.1. The loyalty and commitment to the scheme fluctuated as farmers prioritized their own farms and families</p> <p>5.2. Lack of follow-up of activities, although the coordinator tried to compensate</p> <p>5.3. Producers and buyers participated in the workshops but had a need to be in control of their own actions</p>

These tensions within the themes and sub-themes are elaborated in the following.

### 3.1. Divergence between what the farmers deliver and what buyers request, but both are in need of predictability

The participants appreciated the pre-ordering arrangement in Green Parallel. Nevertheless, we still found that all parties needed increased predictability in the collaboration.

**First**, we found tensions between buyers’ expectations regarding the availability and selection of products and the producers’ expected sales.

The buyers needed more predictability regarding the availability of products so that they knew they would receive what was ordered. The chain retail needed large volumes; for example, they sell thousands of units of broccoli, cauliflower, and salad every week. Other buyers, such as the interviewed restaurant and canteen owners, preferred a wide selection rather than large volumes.



However, even though the farmers produce a diversity of vegetables and other products, they only cultivate a limited amount of each kind. The production was described as vulnerable to climate and weather conditions, pests and diseases, and availability of labor. According to some farmers, this situation created uncertainty about the availability of each vegetable. To meet an increased demand in the market, they claimed that more organic producers and increased production in general are required.

One result of this situation was that the buyers ordered less than they could have, while the farmers experienced fewer and more uncertain sales than expected (this situation is also closely related to product information (3.2.) and preferences (3.3.)). One farmer expressed that the reduced demand resulted in a reduction in the selection on the list in 2020 (also partly due to the pandemic), which, in turn, reduced the attractiveness of Green Parallel among buyers. This again led to fewer sales, and so on.

We identified the negative spiral of uncertainties as a hindering force that was addressed in the workshops. The participants suggested that “production planning” would be a measure that could strengthen the predictability regarding availability, selection, and increased sales through Green Parallel. This planning between producers and buyer was agreed on and written into their action plan. Although some communication about this took place between the two seasons of piloting, we did not observe this planning taking place in a systematic way. Remarkably, even a producer who delivered to the “regime” sales channel admitted that Green Parallel would be attractive if long-term production plans were involved in the collaboration.

**Second**, most buyers found the products to have high quality that justified their higher price, but the chain retail struggled to sell non-uniform products.

All buyers showed a willingness to pay the added price for products from Green Parallel producers because they regarded the products as having qualities that could not be obtained through their regular purchasing schemes, which presumably supported a further interest to buy. Nevertheless, several buyers expressed frustration that the price level varied among the producers of apparently similar products.

Conversely, the chain retail had difficulty selling vegetables from the nearby Green Parallel producer because even though the quality was regarded as good, the products varied in appearance. For example, the salads had other sizes and colors and were also priced by weight rather than per item. The chain retail wanted to educate the customers by showing that vegetables naturally varied in appearance, but they found that their customers had other expectations of vegetables bought in chain retailers compared to purchases directly from producers (REKO networks, farm shops, etc.). This

happened even though the delivering farmer had carefully picked the “best” exemplars from the field and had washed and packed them to meet the requirements of this type of buyer. Other producers stated that they did not want to deliver vegetables to chain retails because of these preferences, as well as the assumed lower opportunity to achieve a decent price.

The interviewed specialty stores, restaurant, and canteens did not emphasize standardized sizes and shapes. The restaurant, for example, asked to buy “leftovers” at a lower price. However, the producers had not prepared for this type of arrangement, as they searched to sell the entire edible yield, through Green Parallel or elsewhere, at a price that matched the cost of producing it. This was only a tension and did not hinder the restaurant from buying full-priced products but the purchase might have been greater with lower prices.

**Third**, we found dilemmas regarding the level of convenience related to transportation, as well as frustrations regarding uncertainties in transportation costs and invoicing.

The farmers and buyers generally found the transportation to function well. Some farmers expressed in the interviews that they could not even imagine themselves starting to deliver goods themselves again. The attractiveness of Green Parallel seemed to be reduced if the participants had to come to pick-up points to deliver or fetch products, as this consumed time and incurred additional transportation costs. Some producers and buyers left or did not join Green Parallel for this reason. The coordinator was continuously faced with the dilemma of deciding how far from the main route the car should drive, because the shared price per capita could increase.

A prominent uncertainty among the producers and buyers was related to transportation costs. Repeated requests by the producers and coordinator to receive calculations and invoice of transportation costs were not met. Thus, the coordinator had difficulty communicating what the transportation cost was going to be, and both existing and potential participants found this to be unpredictable.

As shown, we found tensions within the group. The lower sales volumes than expected, in combination with uncertainties in transportation costs, influenced the farmers’ motivation to continue delivering through the scheme. Similarly, the buyers needed more predictability regarding availability, selection, and transportation costs to find Green Parallel attractive.

### **3.2. Closer contact between producers and buyers is crucial, but who is responsible for taking the initiative?**

A motivation behind Green Parallel was to facilitate closer relations between producers and buyers. The scheme cut the number of intermediaries, such as wholesalers, as only the coordinator and

transporter were the weekly links between seller and buyer. The piloting slowly clarified that views differed regarding who should be responsible for taking the initiative for more direct contact.

**First**, the producers wanted the buyers to visit their farms to experience small-scale farming and the quality of organic products, whereas the buyers expressed in interviews that they wanted to collaborate with the farmers about events. They wanted to arrange “theme evenings” that served local food, sale stands, and product demonstrations, all conducted together with the farmers in their restaurant, store, or canteen. Most buyers wanted to promote the local farms and contribute to branding the products, and they occasionally highlighted the origin of products from Green Parallel producers in menus or posters. The buyers argued that this would benefit both the producers and themselves by advancing sales and building a positive reputation.

**Second**, most of the interviewed buyers expressed that they had expected the producers to be more directly in touch with them. A prevalent attitude was that the “ball is in the producers’ court” when it came to increasing sales and promoting their products. The buyers wanted insight into the uniqueness and story behind the products, but they experienced that they did not have access to this kind of information. Some suggested a digital solution, an app, to be helpful in informing customers about the products, including availability, but the initiative did not have resources for these developments. Similarly, the farmers experienced that placing a sale was more successful when they initiated direct contact with potential buyers themselves, but several explained that they struggled to prioritize enough time for getting in touch. This situation shows the tensions occurring when individual decisions are influenced by external forces (i.e., other tasks claiming their attention).

The coordinator’s knowledge was also considered crucial in this aspect. Although the coordinator was described as outreaching and committed, both the producers and buyers felt that a coordinator should have “raw material knowledge,” like producers or chefs.

We can illustrate the importance of contact and knowledge about the products with the following example: The manager of the chain retail said that several producers and suppliers (outside Green Parallel) contacted them every week, offering locally produced food and bulk supply, and expressed:

The coordinator does a good job, but I can’t trade based on a list. I do not know the products. So, call me then! When one of the producers in Green Parallel called me, I ordered vegetables. I need more product information to place an order.

Even though the buyers were mostly satisfied with the products, the products were not in the expected condition in some cases, resulting in fewer repurchases from the relevant producer. A chef at a restaurant said:

Restaurants receive feedback about what they deliver all the time through Trip Advisor and from customers in the restaurant. The producers in Green Parallel should be curious about reasons if somebody is not purchasing anymore.

One farmer questioned why buyers did not order again, expressing in the interview:

I don't understand. How can they desire more volumes when they do not order? Why don't they order? Seems like they are dissatisfied with something.

The farmer had not asked directly whether they were satisfied; neither did the farmer know how the other farmers did regarding sales, and thus expressed uncertainty regarding the viability of Green Parallel. These citations illustrate that the communication could have been better. Several buyers expressed that a lack of information about the products and little contact with producers were reasons why they had stopped ordering or had bought only small quantities – though this was to a less degree the case for the specialty stores. Unfortunately, how critical this was for these buyers' decisions to buy did not become clear to the producers, coordinator, or researcher in the workshops, as few of these buyers participated in the workshops. Rather, the significance of this expectation was revealed in the interviews at the end of the pilot study.

### **3.3. Small-scale organic farms cannot compete with “local food”**

At the very beginning of the agri-food living lab, even before Green Parallel was co-created, a need for increased awareness about organic farming was acknowledged (Hvitsand et al., 2022). One farmer explicitly expressed in the interview that a misunderstanding existed among customers that local food, in general, is organic or sustainable. This statement was also confirmed among the buyers, who expressed an appreciation of the quality of organic products, but, in general, felt organic certification was not of great importance, as it was considered equally sustainable to buy “local food.” This stance seemed to have the consequence that Green Parallel producers competed with other local producers, including those with more industrialized forms of production and lower prices. One canteen chef expressed:

Norway is semi-organic. ... I need to know what is better by choosing organic compared to local and this needs to be shown to the chefs.

These perceptions could help to explain the low ordering and to underscore the significance of communicating about Green Parallel producers and products, as described in 3.2.

The owners of the specialty stores had knowledge of organic farming, and they revealed similar values regarding sustainability as expressed by the organic farmers. Some of the stores had even participated in co-creating Green Parallel. This attachment made the specialty stores having a higher willingness to pay than other buyers, and this also applied to the stores' customer group.

However, tension arose due to the need for larger volumes in Green Parallel and the desire to stay with the core values. The topic of whether to include other small-scale, but not organically certified, producers was brought up in the workshop evaluating the first season of piloting, as this would help increase volume and decrease transportation costs. The idea was turned down by the participants because the question about who should decide whether a producer had a sustainable production practice that supported the idea behind Green Parallel would be difficult to resolve. The communication with potential buyers was also less unambiguous if it was a channel for organic products.

### **3.4. Personal engagement of purchasers is core to exploring and “pushing” the room to maneuver**

We found a variation in how managers and employees in purchasing entities acted when Green Parallel was presented to them. While some expressed in workshops and interviews that Green Parallel gave them the opportunity to purchase sustainable, local, fresh and seasonal food, to support local farmers, and to offer unique products to their customers, others said they were bound to, or experiencing convenience with, existing purchasing arrangements and routines.

The difference between these two groups (interested and not interested) seemed mainly related to whether an engagement existed that offset a willingness to diverge from established practices of purchasing rather than an actual restriction due to existing arrangements. For example, the manager at the local chain retail explained that they were “unruly” and did not want to be controlled, although having understood that other chain actors were not excited about them purchasing so freely. Because the retail was “merchant-owned,” they had more freedom than those owned by the chain itself and they utilized this opportunity.

Public entities, both the county municipality and a municipality within the region of Green Parallel, had the flexibility to buy 20 percent outside the public procurement agreements. A vocational school canteen owned by the county municipality (with restaurant and food processing educational programs), bought fruits and vegetables through Green Parallel for their students in the first season. They wanted the students to have access to healthy, fresh food so that future purchasing chefs would learn to appreciate local and sustainable vegetables. However, the canteen was told to cease ordering, arguably due to uncertainties regarding the legality of the purchase, when the county municipality signed a new purchasing agreement (although 20 percent was allowed). This shows how the forces of the existing practices external to the initiative overruled the personal willingness and motivation to buy from Green Parallel.

Regarding the municipality, the two kitchen chefs at a medical center wanted to have a green profile and to serve healthy food to patients in recovery. They expressed:

It is up to us whether we want to buy through Green Parallel, and we can cook from what is available through the scheme. For us, the economy is a larger barrier than the agreements, and we must also be sure of getting the goods and that they have been washed. I used Green Parallel several times. We were very happy with the products we received. We have asked about the possibilities for further collaboration, but as I understand the transportation stops. In other words, a pure logistics problem, not quality or price.

In these two public entities, the engaged employees belonged to the canteens. In the case of the County Governor in the region, some employees at the agricultural department had worked for several years at enhancing organic production and local market development (and were also participating in the present project). Nevertheless, these employees experienced difficulties in influencing what was offered in their canteen, as the canteen was run by an external actor.

From this, we understand that professional buyers within the regime could have some room to maneuver to buy locally and outside the established agreements and supply lines but that this requires engagement and courage to diverge from conventional practices. Nonetheless, from our contact with several public entities during the piloting period, our impression is that they are generally cautious and search for convenience, as also confirmed by the interview with Matvalget (Food Choice). They explained that economic constraints and an aversion to extra administrative work at several levels are often larger barriers to public purchases of local food than are barriers related to purchasing agreements. This can be illustrated by referring to a public entity not interested in purchasing through Green Parallel: They were satisfied with the simplicity of the existing arrangements but explained that if they really wanted local organic food, they could have argued and gotten a green light for purchasing this locally. From this, we understand that the tendency to stay within existing structures is an external hindering force.

### **3.5. Difficult to move from individual to collective thinking: trust and commitment are crucial elements, but economy often decides**

Several involved participants were highly motivated to collaborate based on the co-created shared vision and expectations of Green Parallel. However, the actual individual commitment to follow up on the collective project did not match this desire to collaborate. Additionally, the informal collaborative format was weak in supporting decision making and commitment.

The participatory methodology was chosen to enable the transition from individual to collective action. Genuine interest in the initiative was evident. Most producers participated regularly in

workshops, actively took part in dialogues, and suggested adjustments. They expressed an appreciation of the meeting areas and the structured dialogues as these facilitated the opportunity to exchange experiences and reflect together. Even though participants regularly had not followed up on tasks, the workshops were characterized by collaborative orientations, high levels of energy, and looking forward. Feedback from the participant workshop evaluations indicated trust, openness, and creativity, although we found elements of frustration when talking to the participants individually.

At the start-up of Green Parallel, the producers brought their previous customers (or suggested new ones) into the scheme despite being aware of the risk of losing sales to other producers. We interpret this act as a clear sign of mutual trust and faith in the collective project that may gain them all. This collective thinking was also observed on other occasions, such as in the reluctance shown by the producers to compete with each other on specific products (this lasted throughout the piloting). One interviewed farmer underscored that they were colleagues and not competitors, and that they were to cover the demand together. At the same time, the participants acknowledged that building a scheme and concept, such as Green Parallel, would take time and endurance, and they articulated this in both workshops and interviews.

Despite this supportive framing, collective action was challenging for three closely related reasons.

**First**, we observed fluctuations in loyalty and commitment to the scheme.

In some situations, the farmers had no other choice than to turn their engagement toward their own pressing needs, such as when a lack of foreign workers (as a result of the COVID-19 pandemic) or family matters influenced their ability to engage in Green Parallel.

We also observed an impatience in achieving profitability from selling through Green Parallel, and one farmer who did not continue into the second season of piloting explained in the interview:

Last year, it was a portion of idealism among the participants, but it was not profitable.

With small and uncertain economic margins, the farmers showed an adaptivity to shift between different sales channels. An example of this is when the concept of “REKO networks” emerged in Norway. In the second season of the piloting, some farmers who had been involved in starting up Green Parallel began to engage actively in the administration of and sales through REKO networks. These farmers experienced a great demand for vegetables and fruits by consumers, flexibility in the delivery content, and a willingness to pay the prices that the farmers decided. An interview with the farmer who had functioned as a coordinator the first season revealed a dilemma of being drawn between the more attractive sales to individual customers through REKO and the fear of ruining

Green Parallel by withdrawing. The farmer expressed that it was pleasant to put together and hand over the vegetable box at the REKO events. Both the researcher and the coordinator observed that the entrance of REKO took the attention away from the collective efforts needed to build Green Parallel.

Apart from the specialty stores, the professional buyers seemed to consider themselves to be “pure” customers of Green Parallel producers, rather than part of a collective project for strengthening the position of locally produced organic vegetables. Several buyers had not been part of the co-creation of Green Parallel, which presumably influenced their commitment to regular utilization of the scheme and participation in workshops. The owner of one specialty store, by contrast, offered to take shifts in coordinating the orders of Green Parallel, if that was what was necessary for the scheme to continue into the future.

**Second,** we observed a lack of follow-up on the activities, although the coordinator tried to compensate for this in diverse ways.

In the first season, we observed that the involved parties were generous with each other regarding small mistakes and lack of follow-up. However, in the second season, the participants displayed increasing frustration. The coordinator was frustrated with cases of poor compliance with deadlines regarding delivering product lists, ordering, calculating and invoicing transportation costs, and having the products ready in time for pick-up, etc. The coordinator found following up on these issues very time-consuming. Most farmers were aware of the need for better follow-up and stated in the interviews that they did not put the effort they “should” into the common project of building a new scheme, including the continued recruitment of a stable base of sellers and buyers. Although the farmers expressed a need for Green Parallel and conveyed that the development of Green Parallel was a mutual responsibility, we observed that they did not establish the habit of marketing Green Parallel, in addition to their own farms, through social media.

**Third,** committing to common decisions seemed challenging as the participants were used to being in control themselves.

One farmer expressed in the interview that “everybody has a voice, but nobody decides.” An illustration of this is that the same producer, who was new as a farmer in the second season of Green Parallel, had a desire to communicate with other producers about pricing and to collaborate on production planning. Others supported this, and the activities were stated in action plans, but none of these activities were systematically conducted, as already explained in 3.1.



Collective decision making also seemed difficult in some cases. An example of this was whether Green Parallel should be more focused and strategic regarding its markets. One new and inexperienced farmer was open to delivering to the local chain retail while other producers did not want to adjust to the requirements of chain retails regarding vegetables. In this case, they did not make a decision to narrow the market.

The need for a strong and committed group and a formalization of the collaboration if Green Parallel was to continue was stated by a farmer:

Most people have enough with their own projects, and do not feel they are having the capacity, that it is not a large enough part of the business. This is a challenge for Green Parallel – is it important enough? It will need a strong group, and it helps to have the meeting arenas. If to be continued it must be formulated a strategy and formed a joint stock corporation or a cooperative.

Furthermore, the farmers seemed to have some difficulties in letting go of being in full control, as they were used to. Even though they appreciated the job of the coordinator and Green Parallel, one farmer stated in the interview:

The coordinator is punctual and follows up, but I have my own need for control. I do it myself if things are not done exactly the way I want it. I have sold products to participating buyers not going through the coordinator when I only have small amounts of something, and I have then contacted (name of stores) or did so when I saw that the raspberry was getting ripe during the weekend, or the asparagus beans. But I understand that this can cause lack of space in the car if everybody does this.

As shown, the producers were continuously looking for the most profitable sales channels for their products for their businesses to survive in the short term; thus, laying the foundation for long-term collective commitment was challenging. The difficulties or dilemmas for small-scale farmers can be illustrated by a reflection on “the larger picture” by an interviewed producer who delivers to the dominant long supply chains. This producer highlighted a contradiction in the agriculture policy, termed a “two-tongued policy,” that is enhancing large-scale farming while, at the same time, giving project grants to help small-scale farmers, even though the current agricultural structures have no room for them. This illustrates the tensions between project-financed initiatives, such as Green Parallel, and external forces working against these initiatives’ ability to survive long term.

### **3.6. Epilogue: The Green Parallel network as a base for continued initiatives**

Although Green Parallel has not continued in the same form after the piloting, different forms of collaborations are continuing in the region. The experiences from the piloting of Green Parallel were presented in a workshop in 2021, followed by engaged dialogues about further activities. We have observed new, more one-to-one collaborations between producers and professional buyers, and the

chefs in newly started restaurants are contacting Green Parallel producers. We have also observed that the coordinator has become a resource person and a contact point in the region with a large network and is supporting new, more local projects, some in collaboration with the County Governor's agricultural department. As the coordinator expressed:

Green Parallel was maybe some years too early, but we have learned a lot.

## 4. Discussion

The alternative food network (AFN) of Green Parallel was co-created in an agri-food living lab in response to the vision of closer connections and sales between organic producers and professional buyers, such as stores, restaurants, and private and public canteens in the Vestfold region of Norway (Hvitsand et al., 2022). The idea and planning underlying Green Parallel took place in a protected space (Smith and Raven, 2012) and, by its design, became entangled practically with regime actors when piloted. Here, we discuss the findings related to emerging tensions and forces influencing the viability of Green Parallel, and we reflect on the applied action research methodology.

We found that tensions and forces worked in complex interdependencies, both within individuals and actor types and across actor types, as well as across niche-internal and external spans. This study contributes new insight into change processes in whole value chains (Darnhofer et al., 2012; Köhler et al., 2019; Meynard et al., 2017), how niche innovators, including those in regime entities, act in change situations (Huttunen et al., 2021; Turnheim and Sovacool, 2020). By utilizing elements from field theory as an analytical approach (Burnes and Cooke, 2013), we illuminated the dynamics of occurring forces and tensions, connecting the individual level with the levels of the group and the niche, regime, and landscape (i.e., with the levels in the multi-level perspective) (Schot and Geels, 2008).

Increased societal demand for local, seasonal, and sustainable food, and the legitimacy of the initiative through its anchoring in ongoing regional activities and actors made a favorable landscape context. The support with finances and human resources enabled a structured and coordinated piloting of Green Parallel (Luederitz et al., 2017). Initially, a solid base of motivation existed among the participants relating to the core values of "local and organic" and "collaboration" and served as a strong driving force within the group.

However, the reality in which the different participants operated pulled Green Parallel into different struggles and tensions, resulting from the behavior and decisions of the other participants within the group, as well as external forces outside the direct control of the participants. Participating in the

change initiative also created interpersonal conflicts regarding what they wanted to do and what they were able to do.

At the niche-innovation level, the experienced lack of predictability in supply and demand, direct producer–buyer contact, and collective commitment, among others, created uncertainties in the collaboration. Over time, these uncertainties and unfulfilled expectations increasingly affected the participants' motivations and decisions about whether to continue to sell or buy through Green Parallel, coinciding with what Meijer et al. (2007) found in a study of entrepreneurial activities in the energy sector. Production planning and more direct contact between producers and buyers, as well as more formalized agreements, could have created more predictability and commitment and strengthened relationships and values development within the group – these being of special importance when more (regime) actors enroll (Bui et al., 2016) or if volumes increase (Lamine and Noe, 2018). As revealed, development can enter a downward spiral involving a loss of motivation if the group does not manage to address its tensions. These forces and tensions unfold within the group, although to a large degree, they are rooted in the environment outside the group (i.e., they are external forces that influence the decisions of individuals within the group). For example, the COVID-19 pandemic served as a landscape force that had a negative influence on the piloting the second season, as serving places had limited activity and fewer purchases.

The engagement and demand for local food among personally engaged professional buyers were individually based supportive forces. However, most buyers met counterforces from their environment that they could not immediately influence. Thus, although empowered to act through the infrastructure of and engagement in niche-innovation, most were disempowered from continuing to take part in the sustainability transition due to regime structures and practices. An example of this was that the customers in the chain retail refrained from buying nonuniform vegetables that the manager had purchased. Organizational caution and a desire for convenience in public entities were further barriers to diverging from routinized ways of purchasing. Nevertheless, with the engagement and courage of regime employees, the room to maneuver can, in small portions and within the legal regulations, be pushed to allow alternative actions to the existing regime structures and practices, thereby contributing to driving transitions (Huttunen et al., 2021).

The full effect of the supportive force from engaged professional buyers was prevented by their own and societal conflation of “local food” and sustainable or organic food. This conflation is also known from literature (Born and Purcell, 2006; Tregear, 2011). Adding to this knowledge, our study shows that the consequence of this landscape force, manifested through individual preferences, was to create difficulties for small-scale organic farms competing with other “local foods,” including large-

scale conventional vegetable farms in the region. More contact and knowledge development involving the professional buyers could have turned the preferences toward buying organic rather than buying any local food, as a result of changing societal norms about what is considered “right to do,” if taking an institutional economy perspective (Vatn, 2015).

The emergence of another AFN concept, REKO networks (mainly involving individual consumers rather than professional buyers), also reduced or erased some of the farmers’ engagement in Green Parallel, although this created interpersonal loyalty dilemmas. Taking into consideration the limited time, capacity, and desire to avoid deficits, this choice was individually rational in relation to the market logistics (Vatn, 2015), although not a supportive force for Green Parallel. This situation also illustrates that different niche-innovations within the overarching niche of AFNs can compete with each other for available farmers, in addition to the known competition for buyers (Poças Ribeiro et al., 2021). In the second season, the farmers were also forced to focus on their own production due to a deficiency of foreign labor because of the COVID-19 pandemic.

When an intervention like Green Parallel is introduced, we found that tensions and forces reinforced each other and could lead to either upward spirals (toward expected outcomes and visions) or downward spirals (toward the situation before the intervention) (see Figure 4).

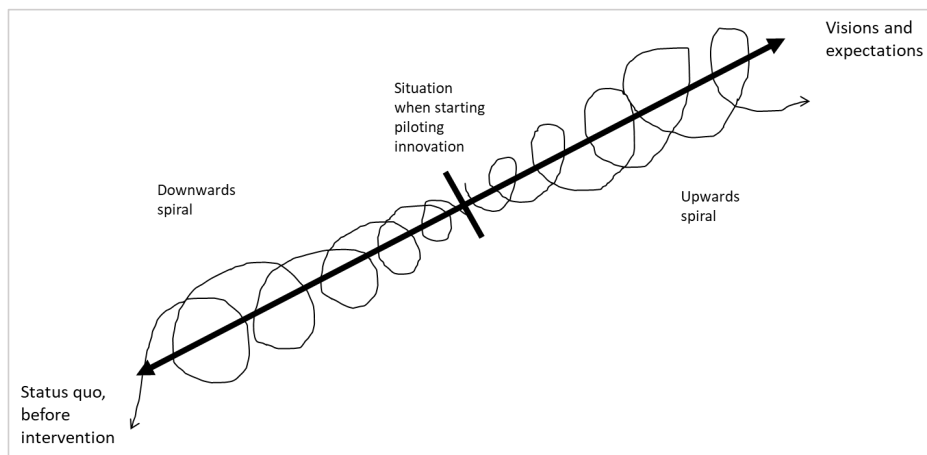


Figure 4: Conceptualization of downward and upward spirals of forces and tensions based on an intervention

We found that the sum of the forces pulled in the direction of the situation as it had been before the intervention (quasi-stationary equilibrium, c.f. Lewin in Burnes and Cooke (2013)). Providing the infrastructure for collaboration on logistic aspects is not enough to enhance AFNs (Kneafsey et al., 2013), as a need remains for continuous commitment from all parties involved to maintain and develop the collaboration.

Some added values are gained by collaborating that would be more difficult to achieve individually, such as influencing the values and norms (Huttunen et al., 2021) through raised awareness of organic foods, and this also applies to collaborations across AFNs (Poças Ribeiro et al., 2021). Moving from individual to collective action, including entering a “we” perspective, was difficult. The action research and workshops were aimed at facilitating ownership and community building with trustful relationships, common values, and commitment, as these are important for changes to take place (Greenwood and Levin, 2006; Luederitz et al., 2017; Poças Ribeiro et al., 2021). The anchoring of Green Parallel in regime actors was fragile, and we assume that a more active participation of these actors in collective knowledge development could have contributed to a more upward spiral with a more intense transmission of niche values and practices (Elzen et al., 2012; Smith and Raven, 2012). However, for the actors to *desire* to actively take part and commit, we found that they need to initially identify with the core values of what is regarded as sustainability, as well as the “we” rationality.

This action research contributed to empowering actors to create collective changes (Greenwood and Levin, 2006), while, at the same time, the complexity and magnitude of hindering forces remained challenging. The different actors involved in Green Parallel acted in ways that were rational in the situation they were in (Fêche et al., 2021; Vatn, 2015), for instance regarding market behavior or beliefs about what are sustainable choices. This illustrates the overarching preconditions of price pressure, competition, and market forces that influence what is considered a feasible set of decisions, thereby supporting Feola (2020) with respect to the need to consider the aspect of capitalism in sustainability transition studies.

Innovative action can contribute to “induce and stimulate smaller changes that in the longer term may have great effects” on the existing system (Elzen et al., 2012, p. 436). Despite not continuing in the same form, the piloting contributed to incremental and small steps of change, including new collaborative constellations in the aftermath. This study has shown that most professional buyers, including public and private canteens and restaurants, are flexible about what to buy and how much. Furthermore, purchasing outside of existing agreements is an opportunity for smaller seasonal purchases from local farms, which can be additional to the efforts of including more organic and local food through regular supply arrangements and tender agreements. Increased demand for local organic food from public entities and educating citizens about organic farming would have been a strong supportive force for AFNs, as also suggested by Bui et al. (2016) and Poças Ribeiro et al. (2021).

## 4.1 Methodological reflections

The methodology facilitated loops of testing, failures, dialogue, learning, and adjustments during the piloting. This was not a linear process, but instead evolved with the knowledge development and needs of the group. The outcome of the piloting could have been different with a different approach (for example, regarding the researcher's role) or if other questions had been asked in the workshops. One unanswered question is whether the participants had less ownership and took less responsibility because a coordinator and a researcher were present who kept the piloting going. Potentially, more of the activities (action plans) could have been followed up if the coordinator or researcher had been more actively involved in the activities themselves, but this would have required additional time and resources and would have diminished the ownership and accountability of the producers and buyers. A closer engagement in the field could have prevented the presence of an analytical distance when studying the initiative (Levin and Ravn, 2007).

Regarding the data collection, the interviews were conducted at the end of the piloting, as the season was too short and intense to enable interviews in the high season. The interviews revealed crucial factors for the decision to purchase, but several of the enrolled buyers had not yet participated in the workshops. Had the full content of these views become clear earlier, including the importance of the producers being more in touch regarding the decision to buy or refrain, this would have been useful for the piloting.

## 5. Conclusion

The action-oriented and whole agri-food systems approach used in this study enabled us to connect disconnected parts in the agri-food systems (i.e., producers and professional buyers), and to connect with work inclusion and training prosperities. The objective of the action research was to encourage more localized agri-food systems for organic vegetables in the Vestfold region in Norway and to generate knowledge about occurring tensions and forces that could support or hinder niche-innovations of AFNs. This was done through the piloting and analysis of Green Parallel, which was co-created by the actors in an agri-food living lab. The real-life testing and participatory approach contributed to a deeper understanding of the tensions arising during the change process and how individuals act within the frames they have or perceive. The discovered tensions and forces indicated areas where a need exists for more knowledge and action for further development and sustainability transitions. This could, for example, be related to investigating different forms of collaborative agreements and decision-making structures for AFNs to enhance predictability and commitment, as well as determining in what ways change-oriented employees in regime entities can be empowered for changes in their own organizations. The importance of getting everybody, even those coming in

later, into the discussion of concepts and problem diagnosis cannot be underestimated, even though this will consume time and resources.

A combination of bottom-up initiatives (e.g., through action research) and top-down policies and activities could potentially contribute to reinforcing upward spirals. More substantially, there is a need for elevating shifts toward more sustainable agri-food systems by changes in rules, practices, power structures and policies rather than remaining to grant economically support to “projects” on a temporary basis. Sustainability transition initiatives cannot themselves deal with pre-conditions, such as capitalism and how the market functions. This prevents long-term thinking, thereby supporting the need posed by Feola (2020) for the integration of capitalism into sustainability transition research.

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## Declaration of Interests

None

## References

- Audet, R., Lefèvre, S., Brisebois, É., & El-Jed, M. (2017). Structuring tensions and key relations of montreal seasonal food markets in the sustainability transition of the agri-food sector. *Sustainability, 9*(3), 320.
- Avelino, F. (2017). Power in sustainability transitions: Analysing power and (dis) empowerment in transformative change towards sustainability. *Environmental Policy and Governance, 27*(6), 505-520.
- Born, B., & Purcell, M. (2006). Avoiding the local trap: Scale and food systems in planning research. *Journal of planning education and research, 26*(2), 195-207.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.
- Bugge, A. B. (2015). Food, meals and morality - how to eat rightly? (In Norwegian). Report no. 3. National Institute for Consumer Research.
- Bui, S., Cardona, A., Lamine, C., & Cerf, M. (2016). Sustainability transitions: Insights on processes of niche-regime interaction and regime reconfiguration in agri-food systems. *Journal of rural studies, 48*, 92-103.

- Bulkeley, H., Coenen, L., Frantzeskaki, N., Hartmann, C., Kronsell, A., Mai, L., . . . Palgan, Y. V. (2016). Urban living labs: governing urban sustainability transitions. *Current Opinion in Environmental Sustainability*, 22, 13-17.
- Burnes, B., & Cooke, B. (2013). Kurt Lewin's Field Theory: A Review and Re-evaluation. *International Journal of Management Reviews*, 15(4), 408-425.
- Darnhofer, I. (2014). Contributing to a transition to sustainability of agri-food systems: Potentials and pitfalls for organic farming. In *Organic farming, prototype for sustainable agricultures* (pp. 439-452): Springer.
- Darnhofer, I., Gibbon, D., & Dedieu, B. (2012). Farming systems research: an approach to inquiry. In *Farming systems research into the 21st century: The new dynamic* (pp. 3-31): Springer.
- De Bernardi, P., Bertello, A., Venuti, F., & Foscolo, E. (2020). How to avoid the tragedy of alternative food networks (AFNs)? The impact of social capital and transparency on AFN performance. *British Food Journal*. Vol. 122 Issue 7, 2171-2186.
- Diaz, M., Darnhofer, I., Darrot, C., & Beuret, J.-E. (2013). Green tides in Brittany: What can we learn about niche–regime interactions? *Environmental Innovation and Societal Transitions*, 8, 62-75.
- Doernberg, A., Zasada, I., Bruszezwska, K., Skoczowski, B., & Piorr, A. (2016). Potentials and limitations of regional organic food supply: A qualitative analysis of two food chain types in the Berlin Metropolitan region. *Sustainability (Switzerland)*, 8(11).
- El Bilali, H. (2019). The multi-level perspective in research on sustainability transitions in agriculture and food systems: A systematic review. *Agriculture*, 9(4), 74.
- Elzen, B., Barbier, M., Cerf, M., & Grin, J. (2012). Stimulating transitions towards sustainable farming systems. In *Farming Systems Research into the 21st century: The new dynamic* (pp. 431-455): Springer.
- Fèche, R., Noûs, C., & Barataud, F. (2021). Building a transformative initiative for a territorialized agri-food system: constructing a living-lab and confronting norms? A case study from Mirecourt (Vosges, France). *Journal of Rural Studies*, 88, 400-409.
- Feola, G. (2020). Capitalism in sustainability transitions research: Time for a critical turn? *Environmental Innovation and Societal Transitions*, 35, 241-250.
- Gamache, G., Anglade, J., Fèche, R., Barataud, F., Mignolet, C., & Coquil, X. (2020). Can living labs offer a pathway to support local agri-food sustainability transitions? *Environmental Innovation and Societal Transitions*, 37, 93-107.
- Greenwood, D. J., & Levin, M. (2006). *Introduction to action research: Social research for social change*: SAGE publications.
- Gugerell, C., Sato, T., Hvitsand, C., Toriyama, D., Suzuki, N., & Penker, M. (2021). Know the Farmer That Feeds You: A Cross-Country Analysis of Spatial-Relational Proximities and the Attractiveness of Community Supported Agriculture. *Agriculture*, 11(10), 1006.
- Huttunen, S., Kaljonen, M., Lonkila, A., Rantala, S., Rekola, A., & Paloniemi, R. (2021). Pluralising agency to understand behaviour change in sustainability transitions. *Energy Research & Social Science*, 76, 102067.
- Hvitsand, C. (2016). Community Supported Agriculture (CSA) as a Transformational Act—Distinct Values and Multiple Motivations among Farmers and Consumers. *Agroecology and Sustainable Food Systems*, 40(4), 333-351.
- Hvitsand, C., Raanaas, R. K., Gjølterud, S., & Nicolaysen, A. M. (2022). 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. *Agricultural Systems*, 199, 103403.
- Ingram, J. (2015). Framing niche-regime linkage as adaptation: an analysis of learning and innovation networks for sustainable agriculture across Europe. *Journal of Rural Studies*, 40, 59-75.
- IPES-food. (2016). From uniformity to diversity: A paradigm shift from industrial agriculture to diversified agroecological systems. International Panel of Experts on Sustainable Food Systems.



- Klerkx, L., Aarts, N., & Leeuwis, C. (2010). Adaptive management in agricultural innovation systems: The interactions between innovation networks and their environment. *Agricultural systems*, 103(6), 390-400.
- Kneafsey, M., Venn, L., Schmutz, U., Balázs, B., Trenchard, L., Eyden-Wood, T., . . . Blackett, M. (2013). Short food supply chains and local food systems in the EU. A state of play of their socio-economic characteristics. *JRC scientific and policy reports*, 123, 129.
- Kvakkestad, V., Berglann, H., Refsgaard, K., & Flaten, O. (2018). Citizen and consumer evaluation of organic food and farming in Norway. *Organic Agriculture*, 8(2), 87-103.
- Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., . . . Boons, F. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions*, 31, 1-32.
- Lamine, C., & Noe, E. B. (2018). Values and volume in sustainable organic market chains: A multi-perspectival analysis. *The International Journal of Sociology of Agriculture and Food*, 24(1).
- Lefèvre, A., Perrin, B., Lesur-Dumoulin, C., Salembier, C., & Navarrete, M. (2020). Challenges of complying with both food value chain specifications and agroecology principles in vegetable crop protection. *Agricultural Systems*, 185.
- Leikvoll, G. K., Aasen, H., Hvitsand, C., Haugen, I., & Engh, M. (2020). REKO networks: An important sales channel for organic agriculture? (in Norwegian). Report no. 3. Telemark Research Institute.
- Levin, M. (2012). Academic integrity in action research. *Action Research*, 10(2), 133-149.
- Levin, M., & Ravn, J. E. (2007). Involved in praxis and analytical at a distance. *Systemic Practice and Action Research*, 20(1), 1-13.
- Luederitz, C., Schöpke, N., Wiek, A., Lang, D. J., Bergmann, M., Bos, J. J., . . . König, A. (2017). Learning through evaluation—A tentative evaluative scheme for sustainability transition experiments. *Journal of Cleaner Production*, 169, 61-76.
- Meijer, I. S., Hekkert, M. P., & Koppenjan, J. F. (2007). The influence of perceived uncertainty on entrepreneurial action in emerging renewable energy technology; biomass gasification projects in the Netherlands. *Energy policy*, 35(11), 5836-5854.
- Meynard, J.-M., Jeuffroy, M.-H., Le Bail, M., Lefèvre, A., Magrini, M.-B., & Michon, C. (2017). Designing coupled innovations for the sustainability transition of agrifood systems. *Agricultural systems*, 157, 330-339.
- Milford, A. B., Kårstad, S., Pettersen, I., Prestvik, A. S., & Storstad, O. (2016). Bottlenecks and opportunities in the value chain for organic fruit, berries and vegetables (in Norwegian). Vol. 2, no. 36. NIBIO.
- Milford, A. B., Lien, G., & Reed, M. (2021). Different sales channels for different farmers: Local and mainstream marketing of organic fruits and vegetables in Norway. *Journal of Rural Studies*, 88, 279-288.
- Milford, A. B., Prestvik, A. S., & Kårstad, S. (2019). Production and sales of organic fruit, berries and vegetables through alternative markets (in Norwegian). Vol. 5, no. 95. NIBIO.
- Norwegian Agriculture Agency (2020). Production and consumption of organic food products. Report for 2019 (In Norwegian). Report no. 19.
- NOU 2011:4. Official Norwegian Report 2011:4. Food, power and powerlessness (in Norwegian). Cross-departmental, committee administrated from Ministry of Agriculture and Food.
- Poças Ribeiro, A., Harmsen, R., Feola, G., Rosales Carréon, J., & Worrell, E. (2021). Organising alternative food networks (AFNs): challenges and facilitating conditions of different AFN types in three EU countries. *Sociologia Ruralis*, 61(2), 491-517.
- Renting, H., Marsden, T. K., & Banks, J. (2003). Understanding alternative food networks: exploring the role of short food supply chains in rural development. *Environment and planning A*, 35(3), 393-412.
- Richards, C., Bjørkhaug, H., Lawrence, G., & Hickman, E. (2013). Retailer-driven agricultural restructuring—Australia, the UK and Norway in comparison. *Agriculture and human values*, 30(2), 235-245.

- Rossi, A. (2017). Beyond food provisioning: The transformative potential of grassroots innovation around food. *Agriculture (Switzerland)*, 7(1).
- Schein, E. H. (1996). Kurt Lewin's change theory in the field and in the classroom: Notes toward a model of managed learning. *Systems practice*, 9(1), 27-47.
- Schot, J., & Geels, F. W. (2008). Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy. *Technology analysis & strategic management*, 20(5), 537-554.
- Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental politics*, 16(4), 584-603.
- Shafieizadeh, K., & Tao, C.-W. W. (2020). How does a menu's information about local food affect restaurant selection? The roles of corporate social responsibility, transparency, and trust. *Journal of Hospitality and Tourism Management*, 43, 232-240.
- Skjelvik, J. M., Bruvoll, A., & Erlandsen, A. M. (2017). Evaluation of the endeavor for pilot counties regarding the development of organic agriculture (in Norwegian). Report no. 1. Vista Analyse.
- Smith, A., & Raven, R. (2012). What is protective space? Reconsidering niches in transitions to sustainability. *Research Policy*, 41(6), 1025-1036.
- Tjora, A. (2021). Qualitative Research Methods in Practice (in Norwegian). Gyldendal.
- Tregear, A. (2011). Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of Rural Studies*, 27(4), 419-430.
- Turnheim, B., & Sovacool, B. K. (2020). Forever stuck in old ways? Pluralising incumbencies in sustainability transitions. *Environmental Innovation and Societal Transitions*, 35, 180-184.
- Vatn, A. (2015). Environmental governance: institutions, policies and actions: Edward Elgar Publishing.
- Vittersø, G., & Tangeland, T. (2015). The role of consumers in transitions towards sustainable food consumption. The case of organic food in Norway. *Journal of Cleaner Production*, 92, 91-99.
- Winter, M. (2003). Embeddedness, the new food economy and defensive localism. *Journal of Rural Studies*, 19(1), 23-32.
- Yin, R. K. (2013). Case Study Research: Design and Methods. SAGE Publications.



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