

Shaping organic agriculture

Obstacles and opportunities for the emergence of Biocyclic-vegan farming and Community-supported agriculture in the path towards increased sustainability in large-scale organic farming in Germany

Master's Thesis for
Environment and Society
Studies
Radboud Universiteit
Nijmegen
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August 2022



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Degree: Environment and Society Studies, Local environmental change and sustainable cities

Submission Date: August 2022

Cover picture: Plantura GmbH (2022)



Radboud Universiteit



Summary

Certified organic agriculture according to the EU guidelines is currently the main alternative to conventional industrialised farming in Germany. The demand in organic products is rising and the government plans to vastly expand organic production to meet the country's needs. This mainstream organic farming system has been increasingly criticised however, with regards to long-term sustainability effects as well as animal welfare issues.

Alternative approaches for sustainable agriculture are emerging on the grassroots level and display promising strategies regarding agricultural challenges associated with organic farming. This study analyses two niche innovations stemming from a grassroots level, namely, Biocyclic-vegan farming and Community-supported agriculture, which have been gaining increasing attention in the past years regarding their organic farming strategies in the context of sustainable agriculture in Germany. Such niches have been observed to play a significant role in societal transformations and are said to hold high potential in contributing to a sustainability transition in the future.

This study uses the Multi-Level Perspective by F. W. Geels to identify obstacles and opportunities for these approaches to emerge beyond a niche level and gain influence in shaping current mainstream organic agriculture and hence, contribute to increased sustainability in the sector. It does so by analysing the workings and structures within the niches with regards to the factors vision and expectations, networking and learning. Both niches display potential for niche growth and development, doing what is within their means to increase visibility and gain support and resources.

The wider context in which the niches seek to emerge is subsequently taken into account. There has been a trend amongst consumers in the past years to opt for a more environmentally friendly diet such as reducing the consumption of meat and animal products and putting importance on locality and seasonality. This development as well as political statements supporting these values might open up new room for the niches. However, the vast majority of the population seems so far reluctant to change their eating habits and accept higher pricing for environmentally friendly produced goods, which poses a major obstacle to niche emergence.

In international political discourse regarding environmental protection, concrete measures and agreements involving the topic of agriculture are largely avoided. On a European level however, the issue of sustainable farming has been met with new legislations in agricultural politics which have a direct influence on national politics in Germany. These developments as well as an increasing number of national and international environmental movements sharing values and ideals promoted by the niches may create space for them to emerge.

The study sheds light on a number of different issues to which the niches are directly or indirectly connected and gives an overview of the factors that play a role regarding the further development and growth of Biocyclic-vegan farming and Community-supported agriculture, how they interplay with surrounding developments and in which directions they might be headed. The realisation of the concepts of both niches demands a structural as well as cultural shift beyond the agricultural sphere, which is a gradual process. Nevertheless, several developments that can be observed on different levels might open up windows of opportunities for the niches to put forward their ideas and gain influence in the process of restructuring of mainstream organic agriculture.

Preface

This thesis forms the last step to the completion of the master's programme Environment and Society Studies at Radboud University.

During my bachelor studies in geography, I discovered my interest in agriculture and my desire to contribute to finding solutions for agriculture related challenges has been steadily growing. I therefore chose to dedicate this thesis to the topic of alternative agriculture, hoping to give an insight into its complexity as well as the potential it holds.

Completing the thesis has been a long and sometimes difficult process and I would like to give thanks to my supervisor Sietske Veenman for her constructive feedback. Furthermore, I would like to thank the members of the Förderkreis biozyklisch-veganer Anbau e. V., especially Anja Bonzheim, that have supported me in my project giving useful tips, information and being available for answering questions.

I would also like to express gratitude to my wonderful interview partners who made their expertise available to me and took the time to answer my questions patiently and extensively.

Lastly, I want to give special thanks to my friends who accompanied me throughout the entire process of thesis writing, spending endless hours in the library with me, giving emotional support and occasionally, much needed distraction.

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1 Introduction

1.1 The challenges of organic farming

Currently about 50% of land in Germany is used for agricultural purposes and the impacts on the environment caused by the agricultural sector, can be felt more than those of any other industry. Especially the quality of soil, water and air are heavily impacted by agricultural outputs (NABU, 2022). The productivity of farms has increased greatly in the last 70 years. While in 1950 a farmer could supply about 10 people with food, in 2017 the number rose to 140 and is still going up (Umweltbundesamt, 2021¹). This development is mainly due to the extensive use of pesticides, fertilisers and increasingly bigger and more efficient machinery (NABU, 2022). The problematics connected to this intensive form of agriculture however, have become ever more visible. In 2016 more than half of national methane emissions and 95% of ammoniac emissions were caused by the agricultural sector alone, as a result of livestock farming and the use of manure and mineral fertilisers (Deutsche Umwelthilfe e. V., 2022). Furthermore, the tendency to merge smaller areas into big, homogenous fields often eliminating hedges and green verges and less diversification of crops has also contributed to a drastic decrease in biodiversity, since habitat for smaller animals and insects is continuously lost (Schwenner, 2021).

A report on biodiversity and the management of agricultural land, released by the German National Academy of Sciences Leopoldina in 2020, emphasises the connection between agricultural practices and the drastic decrease in biodiversity in Germany. The scientists state that, “the situation is dramatic, the need for action is pressing. It will not be enough to change single components of the agricultural system. What is needed is a holistic societal transition towards a more sustainable agriculture...”¹ (Deutsche Akademie der Naturforscher Leopoldina e. V, 2020; p. 3). It furthermore reminds of the crucial role farming can play regarding environmental protection and the negative impacts of especially intensive industrialised agriculture (Deutsche Akademie der Naturforscher Leopoldina e. V, 2020).

These increasingly pressing problems have been receiving growing public and political attention in the past years. In its sustainability strategy 2021, the German government recognised the urgency for taking measures to increase sustainability of human activity in all areas, one of them being agriculture (Bundesregierung, 2021). One alternative to conventional industrialised agriculture the way it is predominantly practiced in Germany, are organic farming approaches, which commit themselves to practice agriculture in a more environmentally compatible way (Bundesanstalt für Landwirtschaft und Ernährung, 2021). As a recognised alternative, the German government introduced the *Bio-Siegel* in 2001. This is a label marking the organic production of agricultural goods and can be acquired by producers that pledge to respect certain predetermined guidelines during the production process. These include for example that no chemical fertilisers or pesticides and no genetically modified seeds must be used, a set number of animals per square metre must not be exceeded and the usage of antibiotics on livestock is severely restricted. Since 2010, the Bio-Siegel represents the same organic farming standards as the organic farming logo set up by the EU. Certified groceries are becoming increasingly popular amongst

¹ Own translation

environmentally conscious consumers. While in 2010 the share of organically produced groceries in Germany made up 3.74% of the total amount, the number reached to 5.68% by 2019 (Cosima & Wiebke, 2020). Not only consumers accept organic certification schemes as a means of ensuring the quality and environmental impact of the goods they buy (Dallmus, 2021), politicians have also been paying growing attention to the benefits of organic farming and the German government plans to increase the amount of organically farmed land from currently 9.6 % in 2020 to at least 20% by 2030 (Bundesregierung, 2021).

Even though this kind of standardised certified organic farming has great environmental benefits compared to conventional industrialised agriculture, it is not without criticism. One longstanding problem is the yield per area, which is considerably lower in organic than conventional farming. This is especially striking regarding grains, where in organic farming only about half as much per area can be harvested as in conventional farming. Regarding outdoor vegetables, it is about 75% and indoor ones only about 50% (Bundesanstalt für Landwirtschaft und Ernährung, 2020¹). The resulting difference in income is made up for by the respectively higher price of organic products. This does not however solve the problem of space, of which much more is needed in organic than conventional farming for producing the same amount of products (Bundesanstalt für Landwirtschaft und Ernährung, 2020¹). Increasing the amount of organically farmed land in Germany to 20% would thus require the expansion of agricultural land, which in the face of the already advanced loss of natural areas in the country (Deutsche Akademie der Naturforscher Leopoldina e. V., 2020) could result problematic.

Organic production and consumption are popular not only regarding vegetables and crops. The production and consumption of organically produced meat has also been increasing (Gründer, 2021). Currently 60% of the agricultural land in Germany is used for growing food crops for maintaining livestock. Germany produces in fact more meat than the country consumes and uses 21% of its produced meat for export. For each calorie gained from pork meat, a pig has to eat three calories of plant nutrition (Weltagrabericht, 2022), making livestock farming highly inefficient in terms of space. Organic meat production has just as many negative environmental effects as conventional meat but since livestock feed has to be produced organically and animals are entitled to slightly more room, it overall takes up even more space than conventional meat production (Bollag, 2021). Switching to organic meat production but maintaining current consumption levels is therefore not an environmentally beneficial solution.

Another highly criticised point regarding organic farming, as set out by the Bio-Siegel guidelines, is animal welfare. The German environmental authority (Umweltbundesamt) describes organic farming to include, “Species-appropriate animal keeping, providing sufficient space for roaming and movement”² (Umweltbundesamt, 2021³). “Species-appropriate animal keeping” is however, a very subjective term and much criticism has been raised regarding animal welfare standards in organic farming.

Since organic products have become a trend with revenues in Germany increasing each year, local production cannot keep up with the rising demand for organic foods which is why it is often imported from other EU or non-European countries and this in turn results in negative environmental effects (Umweltbundesamt, 2021²). The image of organic farming in small-sized regional agriculture is in many cases outdated even though consumers often assume that buying certified organic products in the supermarket supports local farms (Dallmus, 2021). Organic agricultural production has become a big business with sizes of

² Own translation

farms increasing and the cultivation of monocultures becoming ever more commonplace due to their increased efficiency (Urkraut, 2020). Producers of organic products are subject to market pressure just like conventional farmers. Requirements regarding size and shape of goods set by wholesale apply to organic produce just as much as to any other, leading to food waste and economic pressure on producers (Biohandel, 2018).

It becomes clear that this kind of standardised organic farming as set out by the EU guidelines is not a long term, sustainable solution for the agricultural challenges society is facing today. Although many improvements in comparison with conventional agriculture can be observed in the organic approach, a number of essential problems such as space, animal welfare and market pressure remain unchanged. The German government's ambition to encourage farms to transition from conventional to organic agriculture (Bundesregierung, 2021) is surely commendable in the face of environmental challenges. However, if there is to be a drastic increase in organic agriculture in Germany, the way it is being practised needs to change. If policy-makers solely rely on the existing, and arguably deficient, organic farming guidelines, their efforts will eventually miss the ultimate goal of creating an environmentally compatible and just agricultural system.

1.2 Niches and alternatives

Alongside this widely spread, mainstream organic agricultural approach, exists a wide range of approaches regarding sustainable agriculture that are less well known and thus not subject of political debates. On a smaller scale scientists, activists and farmers are experimenting with and have developed alternative organic farming approaches, often yielding very positive results (Haack et al. 2020). These so-called niche approaches are initiatives that stem from the grassroots i.e. civil society level and are formed independently of the mainstream. They are thus often able to look for solutions beyond purely economic aspirations, allowing to for experimentation and the gradual development of new systems and structures (Seyfang & Langhorst, 2013).

Two of these approaches that have become increasingly prominent in the alternative agricultural field are Biocyclic-vegan farming and Community-supported agriculture³ (Haack et al., 2020). BCVF opposes the widespread view that animal substances are necessary for successful organic agriculture and emphasises the inefficiency regarding agricultural land use and livestock farming. The Biocyclic-vegan guidelines which were developed by scientists and experts in the fields of agriculture, environmental and consumer interests of the umbrella organisation *Adolf-Hoops-Gesellschaft mbH*, set a direction for a complete livestock-free farming. The approach seeks to build up fertile soil using purely plant based organic matter. Excluding livestock from the farming circle is a solution to several agricultural challenges. On the one hand it is much more efficient in terms of use of space, which is a problem especially in organic farming. On the other hand, animal welfare as well as over usage of manure are no longer an issue (Förderkreis Biozyklisch-Veganer Anbau e.V., 2022²).

The CSA approach developed an alternative to wholesale distribution of agricultural goods, thereby avoiding market pressure, wholesale demands and resulting food waste. In CSA the

³ From now on referred to as BCVF and CSA

costs and risks of farming are shared by an economic community in which the agriculture as such and not the single products are financed allowing for the development of regionally based, environmentally compatible agriculture independent of economic developments in the agricultural sector. CSA has the big advantage of working independently of the food market thereby being able to define terms and conditions regarding sustainability independently of economic pressure. CSA is usually small-scale, local and inclusive and with that wholly transparent for consumers and no costly labels are necessary (Netzwerk Solidarische Landwirtschaft e.V., 2022¹).

Both BCVF and CSA have experienced increasing public and academic attention in the past years and have been recognised as alternative agricultural approaches displaying a high sustainability balance as well as numerous environmental and social benefits. Each of them offers solutions for major drawbacks of mainstream organic farming by approaching the issue of sustainable agriculture from a completely different angle (Haack et al., 2020). This paper analyses the potential role of these two niche innovations in a shift towards increased sustainability in the organic agriculture sector in Germany.

1.3 Research aim and research question

A shift to predominantly standardised organic farming in Germany might be a first step towards a shift away from conventional agriculture altogether and higher environmental compatibility in the agricultural field as a whole. Since mainstream organic farming has heavy shortcomings however, alternative approaches may be considered which offer alternative solutions for achieving a more sustainable organic agriculture. This research therefore investigates two cases of innovative niches, namely BCVF and CSA and aims to identify the obstacles and opportunities for the two approaches to exert influence in a transition towards higher sustainability in the organic farming sector in Germany.

The internal workings of the approaches, their institutional set ups and their methods for expansion are first analysed using certain indicators identified in literature to gain an understanding of the niches' dynamics and their internal potential to grow. For a holistic picture, it is crucial to consider the wider context in which the niches aim to emerge as well as the development of the approaches as such. The niches' current position in relation to agricultural systems, politics and societal paradigms in place are subsequently analysed in order to see where opportunities and challenges for niche emergence lie with regards to the current regime. Lastly, global developments that are of relevance for agricultural shifts are taken into account as these might influence national processes potentially opening up new opportunities for the niches. In doing that, the research aims to give a holistic insight into the processes of niche development and emergence in the agricultural field by identifying specific obstacles on various levels as well as opportunities and chances found in the external context and within the niches.

In order to respond to the aforementioned problem statement and pursue the research objective, the following research question is posed. This includes three sub-questions which aid to answer the main question adequately.

What are opportunities and obstacles for the Biocyclic-vegan farming and Community-supported agriculture approach to play a more prominent role in shaping the mainstream organic farming scheme in Germany and thus contribute to more sustainability in the sector?

- Do the internal workings of BCVF and CSA show potential of successful niche-growth?
- To which extent are the alternative methods of BCVF and CSA compatible with the current socio-technical regime?
- In how far do global developments influence the emergence of BCVF and CSA as innovative niches?

1.4 Societal and scientific relevance

Since the problems of agriculture in general and specifically mainstream organic agriculture have become more widely recognised in society, an increasing number of niche initiatives are springing up in the agricultural field aiming to revolutionise farming practices and redefine agricultural economies (Alexander u. Rutherford 2014). Reformists are of the opinion that such approaches can foster ecological awareness and gradually establish values and ideals in society that support an agricultural shift which will eventually make an impact also on the political and governmental level (Alexander u. Rutherford, 2014; Heinberg, 2002). As opposed to top-down changes coming from a political level, niche approaches offer valuable practical experience and knowledge which can complement political ambitions. A broader, multi-level approaches is estimated to be the most efficient way forward regarding the transformation of agriculture and food systems (Gray, 2021).

This research investigates two cases of niche innovations in close detail considering potential obstacles and opportunities for contributing to the development of new sustainable practices. The knowledge gained by this study contributes to the still deficient body of literature regarding the development, emergence and influence of niche innovations in the sustainability field (Seyfang & Smith, 2007). It can thereby aid niche actors to get a clearer picture of challenges currently facing successful niche emergence in the agricultural field according to which they might adapt their strategies and course of action. The research may also encourage policy-makers to consider niche approaches as sources of innovation and inspiration on the path towards the development of new agricultural methods and policies. It can thus contribute to bridging the gap between top-down and bottom-up approaches in order to find holistic solutions with the highest possible environmental and societal benefits. In Germany more organic products are bought than in any other EU country (European Parliament, 2021) and revenues have been increasing each year (Gründer, 2021). It is therefore important that different sources for improving mainstream organic farming are considered in future agricultural measures and policies. The research gives an insight into the problematics regarding mainstream organic farming to foster understanding for the need for an agricultural transition. Decision-makers and politicians in the agricultural field are thus made aware of the problems and by close inspection of two innovative approaches, presented with possible ways to overcome these, ameliorating sustainability in the agricultural field.

Since current agriculture is responsible for a large part of emissions, on the national level, the research contributes to reaching environmental targets set by German government such as climate neutrality in 2045 (Die Bundesregierung, 2022). On an international and global level, reducing agricultural environmental impacts is a crucial point in meeting standards set in the European Green Deal (European Commission²) as well as climate targets agreed upon by the global community in the Paris Agreement of 2015, in which sustainable agriculture can

play an important role (CAP Energy and Environment Team, 2016). Farmers may also be inspired by this research to adapt their agricultural methods independently of political requirements and thus contribute to increased sustainability in farming. Consumers of agricultural goods, i. e. society at large can be encouraged by this study to make choices in purchasing food more consciously, keeping environmental compatibility in mind and thereby possibly supporting sustainable initiatives.

Most literature on transitions focuses on technological innovations from a top-down approach, usually in a market context. Niche innovations coming from a grassroots level have therefore been researched little in comparison and their role in transitions is “underrated and underconceptualised” (Grin et al., 2010, p. 331). Civil society, which these innovations spring from, is said to be a promising source for sustainability innovations which has however, not been given adequate academic attention considering its potential (Seyfang & Smith, 2007). This study aims therefore to contribute to closing the research gap regarding niche approaches in the sustainability field and give insights in how these can be supported and nourished, as well as limiting factors to their emergence.

Research on agricultural innovation to tackle sustainability challenges focuses largely on the agricultural sector alone, often remaining within the paradigm of industrialised agriculture. Multifunctional, innovative approaches spanning through a wider context tend to be overlooked (Pigford et al., 2018). Sustainability transitions have been the subject of a number of scientific studies, regarding food, agriculture and rural areas. Sustainable niches in agro-food systems however, have so far been paid little attention in academic research (El Bilali, 2019). This paper addresses this lack by analysing two approaches that seek restructuring of agriculture by touching on a variety of related sectors, in order to achieve the highest possible environmental compatibility.

In 2020, the German federal environmental authority (Umweltbundesamt) published a report identifying more than 20 niche innovations which are in some way connected to the country’s food system. These niches were investigated regarding their sustainability potential in the context of improving sustainability in the food system. The report aimed to give decision-makers an overview of the existing niches and the work they do in order to decide which ones are worth supporting or cooperating with in the ambition to increase sustainability in the food sector. The report identifies CSA alongside vegan agriculture as being amongst the ten niches displaying the highest sustainability balance. As a result of that, both approaches are concluded to possess a promising transformational potential. However, since the report serves to give an overview, the individual niches are not described in detail but rather in the form of fact sheets (Haack et al., 2020). This study builds on the results of the report by investigating the two approaches identified as most sustainable in-depth, including the niches internal workings and broader contextualisation. This gives decision-makers a more concrete account of possible contributions of the niches to sustainable organic agriculture.

This paper starts with a literature review of organic farming as well as BCVF and CSA, where the approaches are introduced regarding their ideals, methods and endeavours, their history is briefly outlined, an overview of public reception and critique is given and former research on the approaches is addressed. This knowledge serves as background for a deeper understanding of the analysis and conclusions drawn on the base of it. The literature review is followed by an introduction of the theoretical framework which is used to analyse the topic and on which the research questions are based. In the subsequent conceptualisation and operationalisation, an explanation is given of how the theory is specifically applied to the

research questions and how the analysis was conducted on the base of it. In the following chapter the methods, research philosophy and research strategy are outlined in order to give a transparent account of how data for the analysis was collected and evaluated. The analysis follows the structure of the three sub-questions, starting with the specific set-up and developments within the niches and moving from there to the wider context of the current environment and developments. In the last chapter, conclusions are drawn based on the results from the analysis and linkages between the different analysed aspects are made. These are then related to the conceptual framework. In a brief discussion, the outcome of the study is discussed in relation with prior literature and potential uses it may be put to are addressed. The study closes with a reflection where the working process as well as the validity of the outcome is discussed.

2 Literature review and policy context

2.1 Organic agriculture in Germany

Organic farming can be understood as a way of practicing agriculture based on natural resources without the use of chemicals on the field or in livestock feed as well as genetically modified organisms. Ideally, an organic farming system displays a closed cycle of nutrient flow, using the manure of livestock as fertiliser on the fields. Apart from that, in organic farming emphasis is put on healthy soil life and diversity of crops. Farm animals must have access to outside areas and their food must stem from organic sources (Bundesanstalt für Landwirtschaft und Ernährung, 2021). A comparative study by the Johann Heinrich von Thünen Institut between organic and conventional farming in Germany, has shown that organic farming displays noticeable benefits for the environment and climate (Sanders & Heß, 2019).

Organic farming started as a response to ecological and economic crises in the mid 20th century, which were greatly caused by heavy usage of chemical fertilisers and pesticides in the agricultural field, partly, as a consequence of the green revolution. As a result, organic pioneers stopped using certain substances and cultivation methods on their farms and developed a more environmentally compatible and animal friendly style of farming, which forms the base of organic farming today (BÖLW e. V., 2022). In 1989, organic farming was first supported by the EU and hence developed into a much more concrete alternative for conventional farmers, not only due to the ecological benefits but now also economic ones. This led to a great increase in organically run farms. More organic farming organisations sprang up, accompanied by associations of food processing and sale. For the protection of consumers in a market that is developing rapidly, organic food production is regulated by EU organic regulation guidelines since 1991 (BÖLW e. V., 2022). In Germany these are represented by the Bio-Siegel, as well as the EU organic farming logo (Cosima & Wiebke, 2020).

Organic groceries are becoming increasingly popular amongst environmentally conscious consumers. In 2021, the market for organically farmed and certified produce in Germany grew by 5.8 %, generating 15.87 billion EUR. The demand surpasses the production capacity of the country however and organic products are often imported. An estimated 27% of organically produced pork, 28% of milk and 15% of grain came from outside Germany in

2019/2020. The Federal Ministry for Nutrition and Agriculture (Bundesministerium für Ernährung und Landwirtschaft) points out the so far unexploited market potential in the organic sector for small and middle sized farms in Germany (BMEL, 2022).

Climate and environmental protection seem to be the main incentives for consumers to buy the more costly organic products, as surveys show. Another important factor for consumers is animal welfare (Dallmus, 2021). Organic farm animals suffer less health problems such as limb pains from little movement and hard grounds as is common in conventional farming and their overall well-being including social behaviour and emotional condition is found to be improved (Sanders & Heß, 2019).

Compared to industrialised farming, standardised organic farming according to the EU wide organic guidelines, certainly has great environmental benefits (Bundesanstalt für Landwirtschaft und Ernährung, 2022). However, several aspects regarding the environmental compatibility of this kind of organic farming have been increasingly questioned. Even though it is known that livestock keeping is the most inefficient agricultural approach in terms of land use, it is a central pillar of organic farming in Germany. It is often regarded as a crucial element in a closed nutrient cycle and valued as an important source of income (Hörning et al., 2022). The usage of customary organic fertiliser is commonplace in organic farming and poses an important source of nutrients. This kind of fertiliser often consists of horn chips stemming from animals from non-organic livestock keeping. In European slaughterhouses horn is not usually separated from other animal waste which is why it is in most cases imported from non-European countries such as Pakistan, India or Nigeria. This international nutrient trade puts the feasibility of creating a closed nutrient cycle into question (Kilian 2021). Overfertilisation is a longstanding issue in organic just as much as in conventional farming. Nitrate residues stemming from manure or other organic waste material increasingly affect the quality of ground water and sweet water reserves (Höber, 2020).

Apart from environmental effects of livestock farming, animal welfare is a recurring problem. The EU organic guidelines still allow the dehorning of cows and so do other organic labels in Germany such as *Naturland* or *Bioland*. Furthermore, the separation of calves from their mothers is commonplace in mainstream organic farming. To avoid economic losses in milk production, calves are taken away from the mother cows often only hours after birth, fed separately and are kept in individual boxes. Calves usually feed up to 10 times, get affection from their mothers and learn from them the structures of life in a herd. These natural processes are inhibited by the separation (Bundesanstalt für Landwirtschaft und Ernährung, 2020³).

Even though farm animals are entitled to more space in the barn as well as outside areas in organic farming, the space that is given is often still not enough for proper movement or exercise for the animals. A pig for example needs to be given 1,5 m² of barn space in organic farming as opposed to 1m² in conventional farming. The outside areas that need to be available often do not offer much more room and access for the animals is usually limited. Apart from space, other highly questionable practices regarding livestock treatment are commonplace in mainstream organic just as much as in conventional farming, such as the trimming of beaks of chickens, cutting of pig tails and the killing of weak piglets (The Vactory, 2018). Most organic farms sell their products on wholesale, which is a way to reach many consumers but also means, they have to comply with market conditions in order to keep up with the competition. Size and shape of products are set and in order to maintain a position as a regular supplier for large scale food retailing, farmers sometimes revert to importing organic products from abroad, thus reducing their sustainability balance (Siebert, 2022).

Especially in the context of the environment and sustainability, politics is by many regarded as too slow and, even though the urgency of the problems is known, still putting economic interests above environmental protection (O'Neill, 2017). This is not different when it comes to agriculture. Only recently in January 2022, the German government legally forbade the killing of male chickens. A draft legislation for the issue had been on the political agenda for years and was supposed to have been passed in 2019 already (Deutsche Welle, 2022¹). The demand in organically grown products shows the interest in the topic on the consumer side, yet politics are slow to address the lack of transparency, non-compliance with requirements and the insufficient environmental standards, which are highly criticised (Wachter, 2019).

German agricultural politics is directly linked to the common agricultural policy of the EU (CAP), which was established in 1962 to ensure food security in Europe. It determines agricultural subsidies in all European countries putting round 40% of its overall budget into direct payments to farmers as well as bonuses for rural development measures. Direct subsidies are given according to the amount of land cultivated (Nègre, 2022) and on average round 40% of a German farmer's income is made up of direct subsidies (Land Data GmbH, 2020). The CAP has been much criticised regarding its feeble support for sustainability and animal welfare measures. These fall under "rural development measures" to which only 20% of the overall budget is available. The direct payments which the rest of the money goes into, is another highly criticised point of the CAP. By subsidising per hectare, bigger farms receive higher payments, leading to ever increasing sizes of industrialised farms, making small farms less competitive. In Germany only 1,7 % of farms receive one quarter of all direct payments (BUND, 2022). In the past two years, agricultural reforms have been developed on the EU level which will be put in place in the beginning of 2023. According to the EU, these reforms ensure a fairer treatment of farmers and workers and increased sustainability in the agricultural sector (European Commission²). Within the frame of these reforms, the German government plans to invest more money into subsidising environmental and sustainability measures and lowering the direct payments per hectare (Bockholt, 2022).

2.2 Biocyclic-vegan farming

The most striking distinguishing feature of the Biocyclic-vegan farming approach is that farm animals are completely excluded from their methods and nutrient cycle. BCVF goes beyond a simple livestock-free farming approach in the fact that it also abandons all animal as well as synthetic substances from their farming practices, using exclusively plant-based fertilisation (Bonzheim, 2016). The reason for excluding livestock and animal matter in the BCVF approach is due to ethical considerations as well as for the sake of increasing agricultural efficiency. The term "biocyclic" derives from "bios" meaning life and "kyklos" meaning cycle. "Biocyclic-vegan" thus means to build up natural life cycles and to create ideally closed and exclusively plant-based nutrient cycles by using plant-based compost as fertilisation, regular mulching, crop rotation, the cultivation of wild herbs, nurse crops and catch crops (Förderkreis Biozyklisch-veganer Anbau e.V., 2022²). Due to the lack of animal manure, the growing of leguminous plants which bind nitrogen from the air and make it available in the ground, such as clover or vetch, are crucial (Cropp, 2014). Biodiversity is a very important aspect for Biocyclic-vegan farming and all necessary measures are to be taken to enhance a natural balance of species on the farms (Förderkreis Biozyklisch-veganer Anbau e.V., 2022¹).

In the 1950s, organic farming pioneer Adolf Hoops experimented with livestock free agriculture the Lüneburger Heide creating the “Bio-Modell Walsrode” and his socioecological and methodological findings and knowledge set the base on which Biocyclic-vegan farming rests. These biocyclic principles were then further developed and adapted also to agriculture in Mediterranean climates and experimentation results were successively reinforced with scientific evidence. In 2017, Biocyclic-vegan guidelines were released by the non-profit organisation Adolf-Hoops-Gesellschaft mbH, defining contents and setting standards regarding Biocyclic-vegan cultivation methods. The Biocyclic-vegan guidelines have been accredited by the IFOAM – Organics International as a vegan ecological standard, applicable world-wide and farms can get officially BCVF certified (Förderkreis Biozyklisch-Veganer Anbau, 2022²). The Adolf-Hoops Gesellschaft mbH forms the umbrella organisation of the international Biocyclic-vegan network in the German speaking area. This network is a broad cooperation of organisations, associations, businesses and private members, which advocates and works towards more support for BCVF in Europe. In the countries of Germany, Switzerland and Austria the main organisation fulfilling this task is the *Förderkreis Biozyklisch-Veganer Anbau e.V.*. This association, consisting of about 70 members, focuses especially on supporting and advising farms in a transition towards BCVF. It also works on raising awareness for BCVF in society as well as supporting and conducting research project regarding the topic (Förderkreis Biozyklisch-Veganer Anbau, 2022⁴).

The approaches of livestock free farming, bio-vegan and Biocyclic-vegan farming share many similarities, yet they differ in some respects. In mainstream organic farming the usage of animal-based fertilisers such as manure and customary organic fertiliser consisting of horn chips and ground feathers, or fur pallets are commonplace (see chapter 2.1). The agricultural products are thus not coming from a purely vegan production chain. The same applies to livestock free farms. These often chose to farm without animals out of economic reasons but use animal-base fertilisers from external sources (Schmidt, 2003). Bio-vegan farming takes it a step further and combines the positive aspects of organic farming, i.e. farming without the usage of chemicals, with the principles of veganism (Siebert, 2022). In Bio-vegan farming the idea of a purely vegan production chain is decisive which is why only plant-based fertilisers are used for the cultivation of products. As a vegan farming-approach, Biocyclic-vegan farming mainly stands out through its accredited farming guidelines and certification scheme. Certified farms can thus display the BCVF logo on their products. The BCVF guidelines brought the first concrete, official cultivation standards to bio-vegan agriculture and apart from the general criteria of bio-vegan farming, BCVF puts special emphasis on the creation of mainly closed farm cycles taking into consideration surrounding ecosystems and biodiversity (Förderkreis Biozyklisch-Veganer Anbau e.V. 2022²).

Even though BCVF is frequently praised for its environmental potential (Dreißg, 2019; Ariwa, 2019; Haack et al., 2020), transitioning to such a way of farming demands the acquisition of knowledge regarding natural cycles and nutrient flows. Moreover, alternative methods of fertilisation and pest control must be learned and experimented with. Apart from that, certification is usually a convoluted process entailing high expenses. A transition towards BCVF is therefore a time-consuming, costly and risky undertaking. This is why mostly farmers that already farm organically or livestock free (or both), consider a BCVF certification (Bundesanstalt für Landwirtschaft und Ernährung, 2020²). BCVF is also more dependent on the location than other farming methods. If the soil in a certain area naturally displays a low fertility, humus formation and the cultivation of vegetables can result incredibly challenging. Livestock which feeds on grass or hay can thus be easier to maintain and is also more

resistant to climate fluctuations (Brosius, 2022). Despite its recognised potential, BCVF is still operating as a niche approach in Europe and world-wide. Numbers of certified farms are steadily increasing however and currently (July 2022), there are about 70 enterprises world-wide, including production, processing and commerce, which operate according to the BCVF guidelines, 40 of which are certified or a certification procedure is in progress. Eleven of these are in Germany (Förderkreis Biozyklisch-Veganer Anbau e.V., personal communication, July 21, 2022). Apart from that, about 30% of farms in Germany use a livestock-free approach. For those farms, a transition towards BCVF is much more easily doable than for farms that keep livestock (Bundesanstalt für Landwirtschaft und Ernährung, 2020²).

The BCVF certification scheme was set up in 2017 and the federal agency for agriculture and nutrition (Bundesanstalt für Landwirtschaft und Ernährung) estimates the approach to move beyond the niche level in the near future, considering the increasing number of people following a vegan lifestyle, as well as general public interests in vegan products (Bundesanstalt für Landwirtschaft und Ernährung, 2020²). Even though, a vegan lifestyle is therefore a frequently discussed topic in the media, the development of organic vegan agriculture has not yet been researched to a larger extend, scientific work on the subject consisting mainly of a few sporadic studies. Discourse on the topic is mainly pushed by individuals and different network organisations, which are internationally connected and work towards promoting a vegan lifestyle and vegan agriculture (Fausch, 2016). Despite scepticism in the agricultural sector regarding the feasibility of creating healthy nutrient cycles without animal substances, farms that have used a bio-vegan approach for years, show that it is possible. The necessity for an alternative way of farming is evident, given the level of consumption of animal products in spite of growing health related and environmental concerns as well as increasing criticism regarding animal welfare in agriculture (Albert Schweizer Stiftung, 2020). The animal welfare organisation *Albert-Schweitzer Stiftung* emphasises the need to increase awareness for the urgency for a more plant-based agricultural, also in the political sector. Furthermore, it promotes increased knowledge-sharing connections between different alternative agricultural approaches to find common methodological solutions towards less dependence on livestock in agricultural systems. The organisation acknowledges that the implementation of BCVF methods might of yet not be feasible under any circumstances and climatic conditions but stresses the need for implementation where possible and the appropriate political support (Albert Schweizer Stiftung, 2020). Farming without livestock approaches have repeatedly been pointed out for their high environmental compatibility (Dreißig, 2019; Bundesanstalt für Landwirtschaft und Ernährung, 2020²) and have been titled “Agriculture of the future”⁴ (Ariwa, 2019).

⁴ Own translation

2.3 Community-supported agriculture

In Community-supported agriculture, several households together carry the cost of an agricultural enterprise, for which they obtain part of the yield. Through a personal connection that is thus created, the advantages of an agriculture that is independent of the market and non-industrial, can be experienced by consumers as well as producers. CSA enhances agricultural diversity, regional production and provides spaces for learning and experience in the agricultural field (Netzwerk Solidarische Landwirtschaft e. V., 2022¹)

The concept of CSA originated in the 1960s in Japan and Europe as a reaction to increased environmental damage caused by industrialised agriculture and the consumers' desire for more self-sufficiency (solidaresch landwirtschaft, 2022). In Switzerland and Germany the idea was partly inspired by the anthroposophical ideas of Rudolph Steiner and in the 1960s agricultural partnerships were formed between groups of consumers and farmers (Creative Intelligence, 2012). In the 1980s, CSA pioneers from Switzerland and Germany emigrated to North America, introducing the concept of CSA in the USA (solidaresch landwirtschaft, 2022). It quickly spread in the US and experienced a boom in the early 2000s since environmental impacts due to agriculture are even more heavily felt in the US than in Europe. That boom caused CSA to gain renewed interest and attention also in Europe, where it has been experiencing a heavy upswing during the past years (Umweltinstitut München e. V., 2022).

In CSA, a usually organic farm forms a cooperation with a number of households who agree to pay a certain amount of money over the span of one year which will cover the farm's costs for the production of agricultural goods for that time. They in turn receive agricultural products on a regular basis during the entire season. Consumers can thus ensure the quality and origin of products they eat and the farmers are sure of a stable income, independent of market changes and regulations (Netzwerk Solidarische Landwirtschaft e.V., 2022¹). That way, responsibilities and risks of the agrobusiness are shared between farmers and consumers. Amongst the members themselves solidarity also plays an important role. Financial contributions can vary depending on income and financial capacity so that people from every socio-economic class can take part. Apart from money, many members contribute to the farm by lending a hand in its running. It is not unusual that members of the CSA regularly take part in harvesting, sowing or other physical activities that come up on the farm. Many CSAs also organise community events and activities. Furthermore, a CSA usually holds regular meetings where all members come together and topics regarding the farm and products are discussed (Umweltinstitut München e. V., 2022). A CSA gives its member the opportunity to experience farming first hand and learn more about cultivation methods and plant care, which is something many CSA members value and make use of. Moreover, they have absolute surety where their groceries come from and how they were cultivated (Netzwerk Solidarische Landwirtschaft e.V., 2022¹).

Different varieties of CSAs are found world-wide today. Europe alone counts about 6.300 farms with an estimated one million members (Landwirtschaftskammer Nordrhein-Westfalen, 2019³). Even though the concept of CSA had been introduced in Germany as early as the 1960s, it was only from 2010 onwards that the number of projects has been steadily increasing, rising from round 40 farms in 2011 (Wellner & Theuvsen, 2017) to more than 200 by 2019 (Landwirtschaftskammer Nordrhein-Westfalen, 2019³). Remarkably, even pioneer CSA farms from the 1980s and 1990 managed to maintain and stabilise their concept unlike many alternative economies that eventually adapt to predominant market and production

structures or are absorbed by the government (Gruber, 2020).

In Germany the organisation *Netzwerk Solidarische Landwirtschaft* serves as the official CSA network. The network consists of farmers, consumers and experts in the agricultural field working largely on a voluntary basis to connect different CSAs and provide contacts, advice and educational programmes on the topic of CSA in Germany (Netzwerk Solidarische Landwirtschaft e.V., 2022⁹).

CSA is widely recognised as a high sustainability initiative and predominantly praised as having a positive impact not only on communities and farmers but on the environment as well (van Elsen & Kraiß, 2010; Heimrich, 2013). In CSA, farmed areas include features such as wildflowers areas which foster plant diversity and serve as refuge and habitat for local insects and small animals. This actively counteracts biodiversity loss common to agricultural areas. CSA promotes local and seasonal food consumption. Long transportation of agricultural goods is thus avoided. Through seasonal crop growing, energy usage is kept low, as heated greenhouses and elaborate watering systems are usually avoided (Loesch, 2022).

The growing number of CSA projects world-wide, as well as in Germany, mirrors its increasing popularity in civil society (Wellner & Theuvsen, 2017). The approach has however, also attracted attention from political stakeholders. The German governmental agricultural information centre (Bundesinformationszentrum Landwirtschaft) calls CSA a “fair and climate compatible agriculture”⁵ (BZL, 2022). It is especially praised for the great variety of benefits, ranging from environmental effects over economic benefits such as ensuring farmer’s incomes, to social and educational benefits in bringing members closer to agricultural realities (BZL, 2022). The Chamber of Agriculture of North Rhine-Westphalia (Landwirtschaftskammer NRW), an official organisation representing and regulating agricultural and forestry interest, also commends CSA for the above listed benefits. It points out however, that it is not a universally ideal concept and several things need be considered. Managing a farm where different people with different backgrounds are involved in its running usually entails high communication and organisational efforts. Operational costs are often underestimated and the help by members, which many CSA farms count on, can be unreliable or less efficient than anticipated. Furthermore, members might question the calculation of costs as well as the offer in variety and quantity of goods which can lead to conflict within the CAS (Landwirtschaftskammer Nordrhein-Westfalen, 2019¹).

The CSA concept can be adapted to small patches of agricultural land the size of an allotment as well as several farms on several hundred hectares of land. It is also possible to take only parts of farms such as certain vegetable cultures or kinds of livestock and turn them into a CSA, or include them into an existing one, and farm the rest of the land in a conventional manner (Landwirtschaftskammer Nordrhein-Westfalen, 2019²). The Chamber of Agriculture recommends founders of CSAs or farms considering to become one, to take these aspects into account and take a decision based on their means and circumstances. CSA is frequently viewed as an approach whose potential is not yet exhausted but the issue of future perspectives is often met with questions regarding organisation on a larger scale, financing of bigger networks and increased publicity and networking (Cropp, 2011; van Elsen & Kraiß, 2010; Landwirtschaftskammer Nordrhein-Westfalen, 2019²).

While CSA has been receiving academic attention in the USA since the 1980s, it has been researched little in a scientific context in Germany, with few studies focusing mainly on the expansion and characteristics of initiatives in Germany and Europe (Wellner & Theuvsen,

⁵ Own translation

2017). The USA is still a forerunner regarding CSA research. Researchers' publications have focused on the influence of CSA on its members, their local grocery preferences and CSA and the degrowth economy, amongst others. More recent studies investigated the relationship of supermarket chains and CSA projects, CSA members' eating habits and health and comparisons between CSA and similar approaches (Wellner & Theuvsen, 2017). In Germany, the first scientific study on the topic of CSA was conducted in 2008 by van Elsen & Kraiß who gave an overview of the current state and diffusion of CSA in Germany (van Elsen & Kraiß, 2008). An extensive analysis of the social and economic potential of CSA by Bietau et al. (2013), using qualitative and quantitative methods, concludes it to be a "game-changing and future-orientated innovation"⁶ (Bietau et al., 2013; p. 289). Schlicht et al. conducted a study comparing CSA projects in Switzerland, France, Belgium and Germany with regards to specific characteristics and dispersion (Schlicht et al. 2012). In recent studies Wellner & Theuvsen analysed CSA with regards to regional marketing and its place in the civil sustainability movement (Wellner & Teuvsen 2016, 2017).

3 Theoretical framework

3.1 Strategic niche management

Innovation and transition scholar Frank W. Geels (2011) describes niches as protected spaces, i.e. demonstration projects or research and development laboratories but also as market niches meeting consumers' specific demands or needs. In niche technologies, concepts or systems are developed and experimented with away from the pressures of the market or societal trends which might hinder or influence them. Actors in such niches try to deviate from the mainstream and existing systems by developing innovations that eventually strive to influence or replace the predominant societal structures, such as market constellations, consumers' behaviour, politics and technologies, also referred to as socio-technical regime (Geels, 2011).

The Strategic niche management (SNM) approach views niches as crucial for societal transitions and much of the research in that field investigates the influence of the adaptation of niche innovations on the success of transitions (Schot & Geels, 2008). Niches enable experimentation and technological development outside of the pressure from the regime (Seyfang & Longhurst, 2013) and whereas change within the regime is typically path-dependent and gradual, niches have the potential to bring about revolutionary change (Smith et al., 2010). Though earlier analyses of sustainability transitions have mainly focused on socio-technical innovation in market settings, significant niche innovation regarding sustainability can also be found in the civil society sphere, often focusing on social institutions and arrangements. More recent studies which focus on these grassroots initiatives have extended the analysis of niche innovation to the civil society context. These initiatives aim to find sustainable bottom-up solutions on a collective level by creating new holistic systems and concepts of provision beyond individualistic reforms. The use of greener

⁶ Own translation

technology and techniques is often combined with social innovation (Sayfang & Longhurst, 2013). Only in a few cases however, do such socio-technical experiments i. e. niche innovations, actually trigger or contribute to broader transitions. The factors of success or failure of niche emergence have thus been the object of much research and discussion in academia. Scholars agree that the internal steering of niches plays a crucial role in their development and emergence (Mlecnik, 2014).

There has been much research done on characteristics that niches must display and how they are best nurtured in order to exert the greatest possible influence on the existing regime and stimulate a broader transition (Hoogma et al., 2002; Raven, 2005). Three interdependent main elements for the successful emergence of niches are identified in SNM literature. Firstly, the visions and expectations promoted by the niche should be realistic, achievable and shared by others. Secondly, networking activities are considered crucial to create constituency behind new technologies and ideally involve many different stakeholders to gain resources and support. Lastly, learning, apart from spreading knowledge about facts and figures, should stimulate people to question of the workings of the predominant regime, including mainstream assumptions and frames (Kemp et al. 1998, Schot & Geels 2008, Raven, 2005, Hegger et al., 2007). The three elements are interconnected and dependant on each other in the niche-development trajectory. Learning for example can lead to increased expectations of the niche's functionality which in turn might attract new actors (Raven, 2007). Kemp et al. (1998) highlight the importance of a network of pioneering organisation, technologies and users to create a market for the niche to develop. Network managers who actively promote the innovation and serve as visionaries, identifying windows of opportunities and creating linkages with other organisations have been recognised as crucial for the emergence of such a network (Roep et al., 2003).

In the late 1990s, research on strategic niche management focused mainly on the internal workings of niches. This focus has become broader over the years and academia has realised the importance of external processes and context that can influence a niche's trajectory. The Multi-Level Perspective (chapter 3.2) has placed SNM in the wider context of societal transformations and displays its relationship with external factors. Strategic management of niches alone is unlikely to bring about transformational change. Niches are perceived as crucial for change but the assumption is that interrelated social and technical change in the wider context is required for a niche to be able to trigger or contribute to a broader transformation (Schot & Geels, 2008).

3.2 Multi-Level Perspective

Geels (2002) introduced a Multi-Level-Perspective (MLP) framework which regards such niches in the context of and interaction with the predominant socioeconomic, technological and institutional structures (Geels, 2002, 2011). Geels (2002) distinguishes three levels on which different developments take place that play a role for an overall transition, namely, the niche level, the socio-technical regime and the socio-technical landscape (see figure 1).

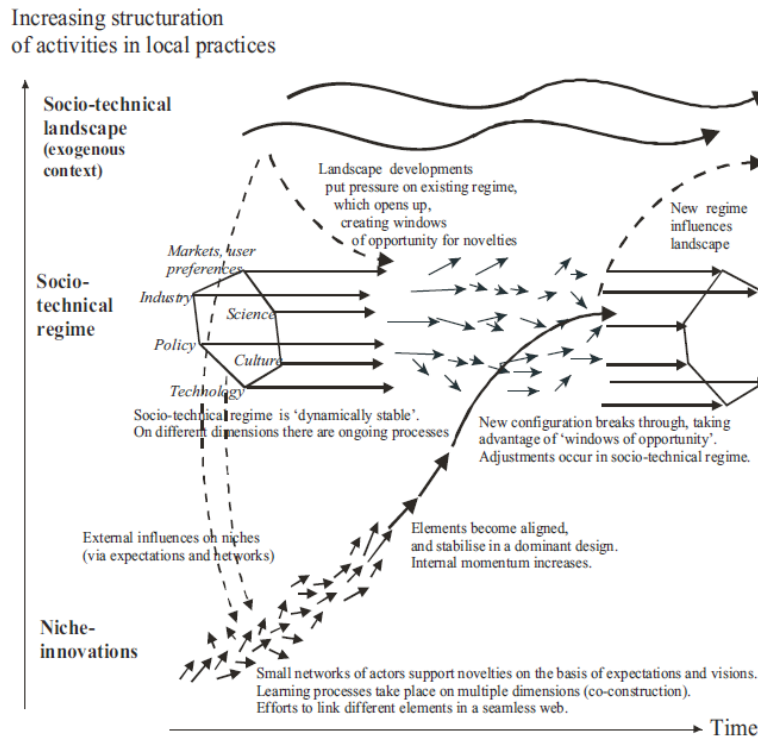


Figure 1: Multi-level perspective on transitions (Geels, 2011)

On the niche level innovative ideas and new concepts are created. This happens often in form of local projects within networks where actors such as individual entrepreneurs or start-ups experiment with new technologies or concepts aiming to influence or replace existing structures. These structures are referred to as the socio-technical regime. Geels (2011) describes this socio-technical regime as the “semi-coherent set of rules that orient and coordinate the activities of the social groups that reproduce the various elements of socio-technical systems” (p. 27). The regime consists of rules and cognitive routines that form the backbone of society such as shared beliefs, lifestyles, institutional arrangements, capabilities and competences. These rules are produced and reproduced by society, where they influence the individual’s behaviour on the one hand but are at the same time the outcome of peoples’ actions. The socio-technical landscape are developments on a broader level which have influence on the regime. The landscape forms an external context consisting of superordinate developments that cannot be influenced on the short term such as political ideologies, societal values and macro-economic patterns, which usually change only slowly (Geels, 2011).

The three different levels, niches, regime and landscape, are connected via interaction between processes occurring at different levels. Therefore, niches are crucial for transitions as they can set out the base for change. Niches create momentum on the grassroots level which can set off impulses in the regime. They can become influential if their ideals or workings become more commonplace and broadly accepted, their networks become larger and a connection to the current regime is built through stable structures of the niche. Changes in the landscape can put pressure on the regime as well, which can lead to its destabilisation. This creates so called “windows of opportunities” (Geels, 2011; p. 29) for niche innovations, meaning, the chance to push through technical and socio-economic

structures of niches, leading to adaptive changes on the regime level (Geels, 2011). Interaction between the three levels is crucial for transition. Earlier research on interactions between the different levels focused mainly on technological innovations and substitution. In the past years scholars have differentiated between different kinds of interaction as well as transition pathways. The idea of a mere technical innovation as trigger for transformation has thus become outdated and the conception of transitions and the role of niches in them has become more complex (Schot & Geels, 2008).

Niches can consist of actors and intermediary organisation which fulfil the function of dispersing the niches practices, learning and standards on a regime or global level. Networking and lobbying are also made use of by intermediates while keeping contact with the niche level, informing them of opportunities and staying informed about new projects or experiments from within the niche (Kemp et al., 1998; Geels and Raven, 2006).

Depending on the kind of interaction between the three levels, the trajectories for niche innovation can differ. If a destabilisation of the socio-technical regime leads to its collapse or failure in certain areas, niche innovation might eventually expand to fill that place. They could however also compete with and eventually replace the regime. Another outcome is that they exist and work alongside the regime without greatly changing it instead, or they merely pose as a source of synergistic reforms which may be taken up by the regime and incorporated into it (Geels and Schot, 2010). As these possible trajectories show, niches do not need to strive to fully replace the regime. Offering ideas and concepts to improve the current regime and working alongside it are also ways for niches to disperse their ideas and exert influence. Nevertheless, in order to create room for niches to exist alongside a regime, a certain degree of destabilisation as well as landscape pressure is estimated to be crucial (Seyfang & Langhurst, 2013).

3.3 Conceptualisation and operationalisation

This paper explores in the opportunities and obstacles for BCVF and CSA to play a more prominent role in shaping the mainstream organic farming system in Germany. The MLP framework offers a holistic concept of socio-technical transformations, taking into account niche innovation as well as external influences on the regime and landscape level, which helps to put a potential agricultural transformation into context. It presents a theoretical basis for understanding dynamics and origins of transformations and the role of niches in them. Complementary to that, SNM puts a closer focus on the niches themselves, serving as a useful tool to analyse the internal workings of BCVF and CSA and thus determine their potential as innovative niches.

In the case of this study, organic farming, the way it is commonly practiced in Germany today makes up the regime which the niches i.e. BCVF and CSA seek to influence (see figure 2). This study views niches as “protected spaces” for experimentation and innovation, which is a common definition of niches (Seyfang & Langhurst, 2013) and also used by Geels (2011), as described in chapter 3.1. BCVF and CSA are also grassroots initiatives in the sustainability field, springing from the civil society sphere and display the characteristics typical for these types of niches as laid out by Seyfang & Langhurst (2013) (chapter 3.1). The term “sustainability” does not have a universal definition but its meaning differs regarding context and author (Dobson, 1996). As opposed to putting economic development at the centre of the debate, as is often the case with the term “sustainable development”,

“sustainability” is usually used to describe the ability of humans to live within the environmental boundaries of the planet (Robinson, 2004). This is the understanding of “sustainability” that is applied in this research. It is also assumed that a vision of “sustainability” encompasses an integration of a social, economic and ecological dimension (Robinson, 2004).

The “socio-technical regime” is used as described by Geels (2011) and explained in chapter 3.2. The developments on the landscape level are equally important to observe as these may put pressure on the regime and thus open potential windows of opportunities for specific niches. The term “socio-technical landscape” is understood as described by Geels (2011) and explained in chapter 3.2. “Biocyclic-vegan farming” is mostly used to refer to all bio-vegan farming approaches, i.e. organic farming without the usage of livestock and livestock substances, also non-certified ones since they often display the same environmental benefits and use largely the same methods. If certification is relevant in a certain context, it is specifically mentioned. The term “mainstream organic farming” is used to refer to the most commonly practiced way of organic farming in Germany, which is in accordance with the EU organic farming guidelines.

The approaches have overlaps with mainstream organic farming but they differ greatly in some aspects, representing different values and viewpoints (Förderkreis Biozyklisch-Veganer Anbau e.V., 2022²; Netzwerk Solidarische Landwirtschaft e.V., 2022¹) and thus display a mismatch with the socio-technical regime, of which mainstream organic farming forms a part. The term “mismatch” refers to a discrepancy or diversion between the values, practices and set up of the niche and those of the regime. Niches promote innovation, thus supporting approaches that are different from what is already commonplace (Schot & Geels, 2008).

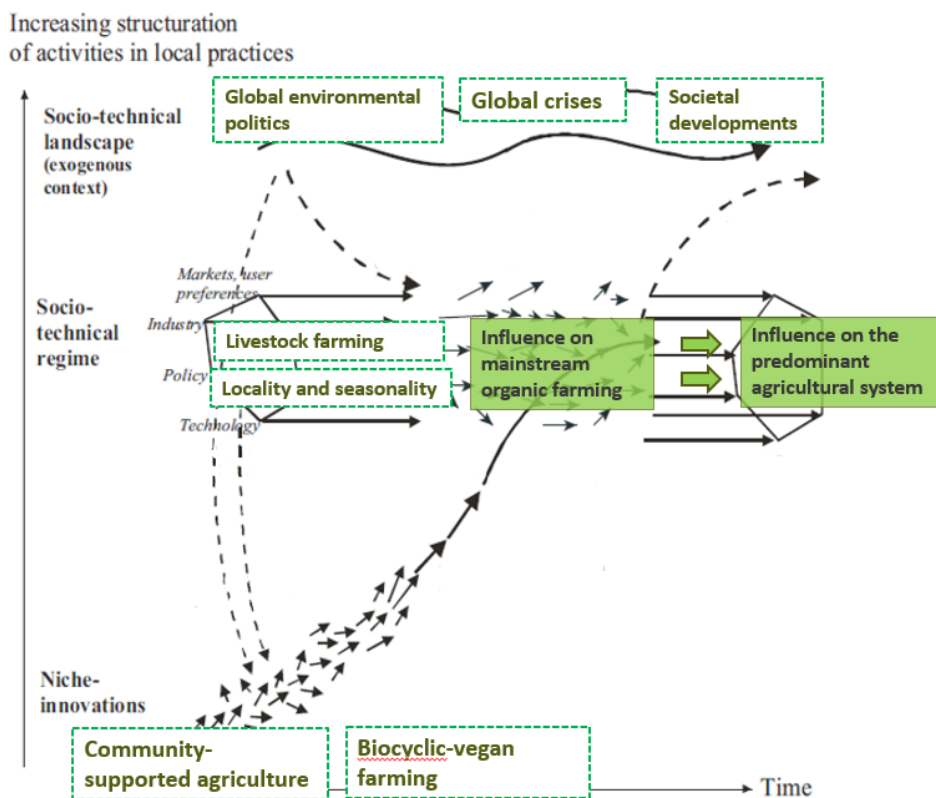


Figure 2: Elements that are analysed (adapted from Geels, 2002)

Figure 2 shows the elements that are selected for the analysis and their current place within the MLP framework. The results of the analyses of all three sub-questions give insights in the difficulties and contact points between BCVF and CSA and the prevailing regime, the niches' internal potential for emergence and developments on the landscape level putting pressure on the regime. Taking this information into account, the main research question is answered by discussing opportunities and obstacles for BCVF and CSA to play a more prominent role in shaping the current organic farming system towards more sustainable practices in the future.

The first sub-question asks in how far the internal workings of BCVF and CSA show potential of successful niche-growth as defined in academic literature (chapter 3.1) and thus show internal potential to emerge and influence the workings of the regime. As explained in chapter 3.1 the elements that constitute the successful emergence of a niche are its visions and expectations, the networking activities and learning. "Visions" is understood as the idea of the future that supporters of the niche hold and work towards. They consequently have "expectations" of what needs to change and in how far parties from different spheres need to cooperate in order to realise that vision. These factors are interdependent since the more people share the niche's vision, the more likely it is to gain support, making it more achievable and realistic to spread. The "networking activities" that niches carry out refer to their effort to connect with other movements, organisations and different stakeholders to spread their ideas and create possibilities for cooperation as a means to gain support and disseminate their visions. "Learning" is understood to include the niches' initiatives to spread information about their methods and concept as well as teaching their specific applications to outsiders, who in turn can teach them to other people. As opposed to "visions", "learning" also entails teaching and the passing on of more specific methodological knowledge, rather than the broader idea and can be conducted, apart from spreading informational material, via programmes and courses. BCVF and CSA are inspected with regards to each of these factors. It is analysed if their visions can be found in other movements, organisations or institutions indicating their achievability in the current societal context. The different stakeholders involved in activities of the approaches are identified, as well as the extension of networks and if and how partnerships exist between the niches and other networks and organisations. Lastly, the kind of knowledge that is spread by the niches is looked at and the way it is framed. Since the key-elements are very niche-specific, the analysis is done for BCVF and CSA separately, whereas in the other sub-questions, where factors within the wider context are described, the analysis is done for BCVF and CSA together, in order to avoid repetition, since many developments concern both niches, and it is distinguished between the two where necessary.

Sub-question two analyses to which extent the alternative methods of BCVF and CSA are compatible with the current socio-technical regime. There are overlaps and discrepancies regarding many different points but the most prominent aspects, that are specific for the niches and come up most frequently in the literature, are livestock farming and locality and seasonality of products. These issues therefore form the main subjects of the analysis. The issue of livestock is more relevant for BCVF, as it is their distinguishing feature. Locality and seasonality are more relevant for CSA, since it makes up one of their main components. Both factors are relevant issues in organic farming and BCVF and CSA show alternative ways to approach them. Both aspects are analysed regarding BCVF and CSA investigating where differences but also overlaps lie in ideologies or values and subsequently in practices and actions, from the mainstream organic farming system. The arrows pointing

from the niche to the socio-technical regime level in figure 2, represent the influence a niche can ideal-typically exert on the socio-technical regime which can contribute to a transformation.

The last sub-question asks in how far global developments influence the emergence of BCVF and CSA as innovative niches. Geels (2011) describes the socio-technical landscape to consist amongst other aspects of society's technical and material backdrop, demographical trends, political ideologies, societal values and macro-economic patterns. There are many developments on the global landscape that more or less directly impact the global and thus potentially the national agricultural system. Since a thorough investigation of all of these would exceed the scope of this study, the analysis is limited to those developments and events that come up most frequently in literature. The analysis is thus divided into political and societal developments as well as global crises, to which other subjects are connected. Political and societal developments include values that are currently found in society and might be reflected political and civil society actions such as environmental protections or economic wealth. Global crises include events that effect society on a global scale and often influence its customary workings also on a local level such as trade, political action or activism. These aspects, many of which are interdependent, are investigated with regards to their potential influence on organic agriculture and it is analysed which developments display possible opportunities for the niches to emerge and gain popularity and which trends pose obstacles to such an emergence (see figure 2).

4 Methods

4.1 Research philosophy and strategy

Every research is defined by an underlying research philosophy which describes the basic beliefs or principle assumptions of the researcher, which consequently guide them in their actions and influence their choices regarding methods, interpretations and conclusions (Guba & Lincoln, 1994). This is made up of the elements ontology, epistemology and philosophical perspective. The ontological standpoint describes the researcher's view on reality i. e. the assumption of what exists in the world that knowledge can be acquired about. This study assumes that equal understandings of reality or worldviews exist as mental constructs which are found within cultural, cognitive and moral boundaries. With regards to ontology, the study will thus be conducted from a bounded relativism standpoint (Moon & Balckman, 2014).

The way in which knowledge is created is described with the epistemological position. This study takes a constructivist viewpoint assuming that meaning is "created from interplay between the subject and object" (Moon & Blackman, 2014; p. 1167). Lastly, the theoretical perspective must be taken into consideration. The research aims to enhance change in the agricultural field, hence a critical theory perspective is taken which lays open power relations and questions predominant principles and developments (Moon & Blackman, 2014).

This is a deductive study, meaning that theory on the subject is already available which guides and structures the research (Bhattacharjee, 2012). The research consists of a case study analysis on alternative farming, BCVF and CSA serving as the cases.

To gather the main body of data, an extensive desk research is conducted to collect primary and secondary sources containing information on the political and scientific background of the topic. To lay out the political context of the research focus, policy documents are inspected. These first-hand sources give an insight into the political conditions regarding agriculture under which the two investigated cases must operate. Newspaper articles and publications on websites of organisations and reports also form an important part of the primary literature. These give an insight in how far the investigated cases have entered into the public discourse, gaining attention from society and policy-makers and the kind of reactions the niches receive. A number of scientific research reports and articles concerned with related topics are also taken into account in order to establish what knowledge exists so far in that area that can be built on and where research is still lacking. Apart from the desk research, several semi-structured interviews are conducted as part of the research. They are used to gather additional, non-factual and up-to-date information on the agricultural approaches that are analysed in this study. Depending on the kind of information gathered in the interviews, it can be used for the analysis of all three sub-questions. The focus in the interview questions lies on sub-question one and two however, as the topics of an internal niche growth and interactions with the regime are more directly related to people working in the niche and consequentially more useful information from the side of the interviewee can be given.

4.2 Data collection and data analysis

In this study a combination of a desk research and semi-structured interviews with experts are applied as methods for data collection. For the desk research, search engines such as Web of Science and Google Scholar are predominantly used to find secondary sources like scientific publications and studies related to the subject of the research. These consist amongst others of issues in scientific journals, master theses or dissertations. The primary sources are largely found by applying the search engine Ecosia which refers the researcher to the relevant website where first-hand information is made accessible. Sources include well-known newspapers such as The Guardian or websites dealing with agricultural topics like Agrarheute. Websites of official institutions are also consulted, amongst others the German Government's official website, the European Commission and the European Parliament. Three policy documents that are relevant for agricultural developments in Germany are inspected for the analysis. Information on these is listed in table 1.

<p>Deutsche Nachhaltigkeitsstrategie 2021 (Sustainability strategy)</p>	<p>Created and released by the German government in 2021 (<i>Bundesregierung</i>)</p>	<p>Plan for how to increase sustainability in society and economy in Germany and internationally, relates to the SDGs</p>
<p>Klimaschutzprogramm 2030 (Climate protection programme 2030)</p>	<p>Created by the federal ministry for environmental protection and nuclear security BMU and released by the German government in 2019 (<i>Bundesregierung</i>)</p>	<p>Defines measures to reach European and international climate goals defined in COP15 and the Climate Action Summit 2019</p>

Zukunftsstrategie Ökologischer Landbau (Future strategy for organic farming)	Created and released by the federal ministry for nutrition and agriculture BMEL (<i>Bundesministerium für Ernährung und Landwirtschaft BMEL</i>)	Introduces 24 concepts for measures aimed at strengthening ecological farming in Germany
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Table 1: Policy documents analysed within the frame of the study

When selecting sources of information, their authenticity and credibility is crucial (Bryman, 2012). For ensuring this, the publishing institution is taken into consideration, to check that the information comes from a professional, reliable source, such as known newspaper companies, organisations or academic and political institutions. The publication date is also taken into account to ensure the information fits into the temporal context of the study.

The findings from the desk research are inspected using content analysis. In this qualitative form of analysis significant parts of the texts are interpreted by the researcher keeping the theoretical background in mind, which guides the focus for choosing relevant information or mentioned concepts. The information that is useful for answering the research questions, which are based on the theory, are then extracted. Statistical data is also consulted where relevant. No statistical data is collected within the scope of this study itself but data that has been published by reliable institutions is used to underpin the qualitative data that is collected or to provide additional information. This is either data that has already been interpreted and might be re-interpreted or if the interpretation is considered suitable, it is used to underpin an argument.

For the semi-structured interviews, experts in the field of community agriculture and vegan agriculture are interviewed. The choice of respondents for the interviews is made on the base of the expert sampling method. This means, interviewees are selected regarding their expertise in the field, thus using a non-random, non-probability selection (Etikan & Bala, 2017). Six experts were interviewed in total, as listed in table 2. The selected experts have been working in the field of vegan agriculture, community agriculture or both, between two and ten years and three of them have studied the topic academically. Two interviewees work in the official BCVF association (see p. 13) and the CSA network (see p. 16) respectively, which overarch individual projects and where issues regarding the movement as such as well as conflicts or challenges within projects are brought together and discussed. The information gathered in the interviews serves to compliment the desk research through which the main body of data is gathered. Both BCVF and CSA provide detailed information about their methods, the movement as such, visions, courses of action and upcoming projects on the internet, either on the website of individual projects or the websites of the main network or association. By setting this against political ambitions and societal trends for example, potential challenges and chances can in many cases be derived. Expert interviews, as described by Bogner et al. (2014) serve to give orientation points within certain fields of interest since experts are often able to relate their knowledge and assumptions to a broader social context due to holding certain social and organisational positions. The experts' knowledge can be divided into business knowledge, which describes the relations of their personal actions, and contextual knowledge, which is the knowledge of the topic in relation to other fields (Bogner et al., 2014). Since this study is not concerned with gathering personal opinions and motivations, it is the second kind of knowledge that is of importance here. Furthermore, the interviews are conducted to obtain factual information about the movements which is not shared online, such as strategies behind certain actions, ways of acquiring funding or intentions regarding future action.

	Institution	Position	Date of interview
Interviewee 1	Hofkollektiv Wipperfürth (CSA)	Founder and managing director of CSA Wipperfürth	03.05.2022
Interviewee 2	Solawi Alfter (vegan CSA)	Coordinator and gardener at CSA Alfter	05.05.2022
Interviewee 3	Förderkreis Biozyklisch-Veganer Anbau e.V. (BCVF association)	Board member of the Förderkreis, coordinator of Project „VegÖl“, consultant for farms interested in BCVF, publicity work	09.05.2022
Interviewee 4	Netzwerk Solidarische Landwirtschaft (official CSA network)	Board member of the CSA network, co-founder of CSA Stuttgart, consultant for new and future CSAs, gardener in CSA Großhöchberg	09.05.2022
Interviewee 5a Interviewee 5b	Solawi Wildwuchs (vegan CSA)	Both coordinator and gardener at CSA Wildwuchs, previously gardener at other CSAs	22.05.2022

Table 2: Interview partners for semi-structured interviews

In preparation for the interviews, an interview manual was created consisting of a list of topics that the researcher wants to cover and the interview questions were subsequently written out. The manual is based on the operationalisation and topics and questions were chosen with the aim to gain as much relevant information as possible for answering the research questions (Van Thiel, 2014, Bryman, 2012). The questions were formulated in an open way, i. e. suggestive or leading questions are avoided so as not to influence the answer of the interviewee and the order of the questions remained open to change if it appears suitable in the situation.

The conducted interviews are subsequently transcribed in Word. To analyse the contents of the interviews a coding scheme is used. In this study, codes are largely based on components of the operationalisation since this is the information most relevant for answering the research questions. Additional codes are added however, regarding certain topics that are repeatedly brought up. The coded text is then inspected in detail. First, the answers that are not relevant for the topic of the study and digressions are separated from the material that is considered for the analysis. For the material that is considered for the analysis, it is estimated if the information makes a useful contribution to finding answers for the research questions. Information that is chosen is then investigated with regards to topics that are mentioned and information that is given. The data is then, like in the content analysis, related back to the conceptual frame outlining how and where it fits into the concept and how can it be interpreted using the theory and its variables as foci.

4.3 Reliability and validity

Since information found and used in a desk research is often produced for a different purpose, special attention must be paid in the operationalisation. The materials have to be selected and used in such a way that the information can be integrated in and complies with the variables of the research questions (Van Thiel, 2014).

Semi-structured interviews as another and very different data source, which enhances the reliability and validity of the research. Information gained in the interviews can underpin

findings from the literature research or question these, if the information is contradictory. For contradicting information, further desk research is done in order to find out why or how the contradiction might occur and used sources are reconsidered with regards to their credibility or interpretation. Depending on its relevance, the information is used and explained in the analysis. Information about personal experiences by the experts is indicated as such, ensuring that it is not mistaken for a scientifically proven fact but a personal experience serving to make information more tangible.

This form of triangulation is used for “double (or triple) checking on the data collection and research results” (Van Thiel, 2014; p. 52). That way, the researcher sees if information from different sources using different methods are in essence coinciding and thereby ensuring a very high reliability and validity. Since conclusions that are drawn are then based on a wide array of research situations and units of study, they tend to have greater external validity and reliability (van Thiel, 113).

5 Analysis

5.1 Niche growth and development

5.1.1 Visions and expectations

According to academic literature, a niche’s visions and expectations (here understood as defined in chapter 3.3) need to be realistic, achievable and shared by others in order for them to be spread more widely and the niche to grow successfully (chapter 3.1).

BCVF

As outlined in chapter 2.2, BCVF strives for a more efficient, environmentally compatible and morally ethical way of farming and thus advocates a concept of organic agriculture without the inclusion of livestock or livestock substances, as well as increased biodiversity on farms. The movement desires any agricultural activities to take a holistic perspective aiming for future-proof and sustainable developments (Förderkreis Biozyklisch-Veganer Anbau e.V., 2022¹). BCVF aims to spread this idea of sustainable agriculture hoping for an increasing number of farms to adapt this concept and contribute to higher sustainability in the agricultural sector.

Successful agriculture in accordance with the BCVF guidelines show that methodologically, the vision of sustainable, purely plant-based farming is realistic and achievable (chapter 2.2). In order for the concept of BCVF to have a place in society however, products stemming from Biocyclic-vegan farms need to be accepted and bought by consumers, so that farmers opting for that approach can make a living.

Although meat is still a firm component of most people’s diet in Germany (Zeißig, 2020) there is a promising development of rising veganism which has been witnessed in the past years. A growing number of consumers chooses to replace animal products with plant-based substitutes due to an increased awareness of environmental and animal welfare issues related to farming (chapter 5.2.1). Alongside these changes on the consumer level, there are also a number of civil society organisations actively working towards ending animal

exploitation and the protection of animal rights (Utopia Team, 2018), thereby spreading the notion of the importance of animal welfare also represented by BCVF. The *Albert Schweizer Stiftung* works towards promoting a vegan lifestyle and the abandonment of intensive livestock farming, working in cooperation with businesses and legal organisations (Albert Schweizer Stiftung, 2022). Others with similar ambitions are *Deutscher Tierschutzbund*, *Vier Pfoten* and Peta (Utopia Team, 2018). Politicians also talk about ensuring higher animal welfare on organic farms (BMEL, 2019) as well as the reduction of livestock due to environmental issues (Zweites Deutsches Fernsehen, 2021). This does of course not mean, that the matter will actually be pursued on the short term, and the definition of animal welfare is debatable, but discussions show that the idea has taken root in the political sphere. However, increasing animal welfare in livestock farming might show that there is awareness for the issue but the vision of a complete livestock free agriculture is still a wholly different matter and harder to gain support for. In Germany, people who declare themselves fully vegan are currently only 2%, a fraction of the overall population (Pawlik, 2022). Another barrier to the vision of vegan agriculture being shared on a larger scale is pricing, which at the moment is usually above average for BCVF certified products (Interviewee 3). As mentioned in chapter 2.1, consumers' incentives for paying an increased price for organic products are animal welfare and environmental protection. These ideals, which exist in BCVF to an even higher extend, might thus stimulate consumers to accept higher costs for BCVF certified products as well. The University of Kassel conducted a research project on consumers' willingness to pay higher prices for certified organic or vegan products and the study confirmed that the majority of consumers asked were willing to pay extra for foods of purely vegan agriculture after they were informed about the benefits of this form of farming (Möstl et al., 2019). Educational work might thus be a tool for generating more understanding and support for BCVF and all it entails.

The ideas of organic vegan agriculture are successively entering into the field of research. In the past years there has been a new interest in research regarding vegan agriculture, which has been increasingly supported by political institutions and environmental organisations. This interest shows awareness of the benefits of vegan agriculture and encouragement for their further development (Schulz, 2021).

The vision of livestock free farming entails the expectation towards consumers to change and adapt their eating habits as well as values and ideals. The above listed developments show that visions of BCVF are shared by a part of society. It has also entered into political discussions as well as the field of research, showing that awareness of the problematics exists also in these spheres. Regarding practical methods, the vision of livestock free farming is realistic and achievable. With regards to society however, despite recent trends, the vast majority of people so far seems unwilling to cut animal products from their diet. Nevertheless, the growing development of increased environmental awareness amongst consumers and politicians, gives hope for future prospects of the ideas of BCVF being eventually shared by a larger group, enhancing their achievability. Although for now, there are decisive obstacles to overcome.

CSA

CSA envisions regional, local and organic agriculture that is sustained by a community so that food sovereignty is ensured and basic food supply is resilient, sustainable and economically viable. It strives to provide full transparency of food production and a sharing of

agricultural responsibilities and risks (chapter 2.3). The approach also aims to serve as a trigger for societal change in a social and economic dimension (Netzwerk Solidarische Landwirtschaft e.V., 2022¹).

The idea of a community-based agriculture has been around since the 1960s in Germany and the concept as such has changed little since then (chapter 2.3), proving that it is methodologically successful, realistic and achievable. Nevertheless, since almost 60 years of its existence, the movement has not moved beyond the niche level which implies that this vision might not be shared by enough people to make it realistic for the concept to spread more widely.

During the past years, however a boom has been witnessed in the development and emergence of CSA with numbers of farms increasing more than fivefold in the past 10 years (Landwirtschaftskammer Nordrhein-Westfalen, 2019³). This drastically growing number of CSAs implies that many people support their ideas and alternative visions of agriculture. Especially crises such as Covid-19 or the Ukraine war often pull people back towards the local and food security has become an increasingly present topic (chapter 5.3). Similar to BCVF, certain developments in the socio-technical regime demonstrate support for the visions and notions of CSA, such as increased societal interest in locality, seasonality of foods and especially transparency regarding agricultural productions (chapter 5.2.2), which CSA can offer (Netzwerk Solidarische Landwirtschaft e.V., 2022¹). The idea of community agriculture where members not only economically but also physically support farmers on the field seems to be largely well-received, according to the interviewees. Especially members from urban areas that do not have their own garden use this opportunity to be physically active and learn (Interviewee 4, 2). Although CSAs work independently of the food market, they enable independence of the global food system only partly, as they usually do not serve as the main food supply for their members, focusing predominantly on vegetables (Wellner & Theuvsen, 2017). However, while in the past years, in many CSAs there were more people interested than could be included, this year several CSAs reported that it was difficult for the first time to find enough members (Interviewee 1, 2, 4, 5a, 5b). Interviewees draw a connection between the Ukrainian war and the resulting political and economic instabilities since among other things, many former members state that they were reluctant to commit themselves financially in these times (Interviewee 1, 2, 4, 5a, 5b).

In the global food system, consumers are used to obtaining any kind of food at any time of the year, any time they desire. When relying on local and seasonal products however, this is different, and interviewees experienced that oftentimes, consumers seem to find it challenging to adapt their eating habits and lifestyle. A box of fresh vegetables each week means more cooking for some people than they would usually do, learning how to process them to make them last longer or which ones can be frozen. Furthermore, similar to BCVF, pricing is reported to be an issue in some CSAs, since prices usually exceed those in the supermarkets due to higher costs of producing organically and paying workers adequately (Interviewee 1, 2, 4, 5a, 5b). Another barrier for consumers seems to be the fact that in summer, there are a lot of vegetables at once, many of the same kind depending on the season, and in winter, there are comparably few and of limited variety. CSA members often put these matters forward as complaints about the concept, especially when they are new to it (Interviewee 1, 5a), yet these are issues that cannot be changed if locality and seasonality is to be ensured.

In order to realise the vision of community-based farming, the expectation towards consumers is to change and adapt their eating habits and lifestyle to a certain extend.

Certainly not all consumers are willing to comply with that and especially in times of crises, priorities seem to move away from supporting local and economically just food production. Similar to BCVF, the ideas are welcomed but consumers seem to struggle when it comes to adapting their habits and lifestyle in order to live by them. However, in spite of this season's difficulties regarding the recruitment of members, the rising numbers of the past years speak for an overall positive development for the niche and peoples' willingness to support and share their visions, which makes it more realistic and achievable for them to be implemented in a wider context.

5.1.2 Networking

In order to create constituency, networking activities (here understood as defined in chapter 3.3) are considered crucial for a niche and ideally involve as many different stakeholders as possible which are able to provide support and resources (chapter 3.1).

BCVF

BCVF consists of a growing international network of agricultural producers, food processors, ecological control and certification bodies and supporting organisations. These promote Biocyclic-vegan farming to gain visibility and work towards certified BCVF products being increasingly available on the market. In the past year, BCVF has developed from a loose movement of bio-vegan agricultural approaches into an official organisation with the Förderkreis biozyklisch-veganer Anbau as its overarching organisation. Even though stakeholders from different sectors are involved, it is still difficult to create value chains and so far, few certified BCVF products are available and easily accessible on the market (Siebert, 2022). The movement is steadily working on increasing its visibility. It has been regularly represented at the *Ökofeldtage*, a yearly meeting where actors of the organic agricultural sector get together to discuss and exchange ideas (Öko-feldtage, 2022) and the *Biofach*, the world-wide biggest fair for organic products (Biofach, 2022). As a result, visibility has increased in the past years and now the movement is often approached by different organisations, such as political parties or organic networks, and asked to hold presentations. Knowledge of the existence of BCVF however, is still largely limited to the alternative agricultural sector (Interviewee 3).

In July 2021 the project *VegÖl (veganer Ökolandbau)* started which is coordinated by the Förderkreis biozyklisch-veganer Anbau and funded by the federal environmental authority, the German Postcode Lottery and the animal justice organisation ARIWA. Goal of the project is the enhancement of the development of Biocyclic-vegan farming to increase its potential contributions to higher sustainability in the agricultural sector (VegÖl, 2022¹). Within the frame of the project, informational material regarding BCVF is created, and different relevant stakeholders are contacted and connected (VegÖl, 2022²).

Judging by these developments, it can be said that BCVF has been gaining resources through the expansion of its network. The number of stakeholders in different spheres that are connected to BCVF, increases the chances of expanding its visibility beyond the alternative agricultural sector. By funding of the *VegÖl* project, a political institution declares open support for vegan agriculture and its benefits and more stakeholders from different

spheres might be reached through the project which may have a leverage effect. Interviewee 3 also stated however, that lack of finance is still the biggest obstacle to doing more proactive networking which is now largely reduced to reacting to requests instead of actively creating linkages (Interviewee 3).

CSA

The CSA network, with the Netzwerk Solidarische Landwirtschaft as its overarching organisation (chapter 2.3), has six partner organisations and associations across the country that it cooperates with and that work together with the network on the promotion and further establishment of CSA in Germany. It has received funding for specific projects from different institutions, among them the federal environmental ministry (Netzwerk Solidarische Landwirtschaft e.V., 2022⁵). Currently, there are two projects running, funded by the Erasmus Plus Programme and the EU Horizon 2020 Research and Innovation Programme and involving different stakeholders from across the world. The network is also represented at the Ökofeldtage as well as other events around agriculture, and specialist conferences are held annually. The network is part of the international CSA network URGENCY, connecting CSAs globally, and takes active part in international exchange projects (Netzwerk Solidarische Landwirtschaft e.V., 2022⁷). On the website of the CSA network, most CSAs in Germany as well as in the surrounding countries, are listed on an interactive map enabling people interested, to find CSAs close to them and to obtain direct information on what kind of products they grow and how to get in touch with them (Netzwerk Solidarische Landwirtschaft e.V., 2022⁶). For gaining new members, many CSAs make use of social media websites such as Facebook and Instagram, as well as relations with other CSAs or similar projects (Interviewee 1, 4). Furthermore, CSAs are often advertised by spreading information and news by word of mouth, which interviewees mentioned to be the most effective method (Interviewee 1, 4, 5a, 5b). Similar to BCVF, the lack of resources is mentioned as an obstacle to increased cooperation with other organisations and more assiduous acquisition of fundings, as Interviewee 4 states, “For the network, we have so many cooperation requests that we are unable to take them all up” (Interviewee 4).

Financial resources are thus still a limiting factor to the further expansion of the network. Although financial support has been received, also from corporate and political stakeholders, it is mostly project-based funding, requiring constant searching for new funding opportunities, which is very time consuming (Interviewee 4). Even though financing prevents the movement from more active networking, the many partner organisations, also beyond national borders and across different sectors, are a promising base for growing constituency.

5.1.3 Learning

The last topic considered a key element for successful niche development is learning (here used as defined in chapter 3.3), which should consist of factual information as well as provide incentives to question the predominant regime (chapter 3.1).

BCVF

Currently, there still seems to be still a lack of easily accessible informational material and especially educational programmes regarding vegan agriculture, which is assumed to be

partly responsible for its relatively slow emergence (Schulz, 2021). To work against this, the Förderkreis biozyklisch-veganer Anbau is undertaking many initiatives to enhance learning on agricultural methods, challenges and relevant developments within the BCVF movement and beyond it. Presentations are held on different agricultural events as well as in educational institutions such as agricultural schools or universities, to make the benefits of vegan agriculture known in the mainstream agricultural sphere. For producers that are interested in BCVF, courses are organised to familiarise them with the methods and concept of the approach and encourage them to integrate them into their production. The planning and conduction of these however, was stagnating in the past two years due to the Corona crisis but is planned to be taken up again and further expanded (Interviewee 3). The creation of informational material also plays an important role in spreading knowledge on mainstream agricultural shortcomings and benefits of BCVF. This comes in form of flyers, factsheets or posters, on social media and the website of the Förderkreis (Förderkreis Biozyklisch-Veganer Anbau e.V., 2022³). The Förderkreis is currently also working on establishing an e-learning platform for the provision and exchange of knowledge to give especially interested producers easier access to the topic (Interviewee 3).

The kind of knowledge that is spread depends on the target group. Interviewee 3 explains that knowledge-spreading proved to be most efficient when considering the context. Producers interested in getting BCVF certified, usually know about its benefits and are more concerned about specific measures they can take to transition their production to BCVF. Information about why it is needed and valuable is mostly shared with consumers to potentially influence their choice of product as well as political stakeholders that have the means to spread that kind of knowledge and take influence (Interviewee 3). Within the BCVF movement as such, knowledge is also regularly exchanged and generated. The Förderkreis has, amongst others, a research working group consisting of individual researchers and interested parties that share research results, initiate new projects and discuss current issues regarding BCVF. Another working group is concerned with publicity of the movement via different media, as well as creating informational content (Förderkreis Biozyklisch-Veganer Anbau e.V., 2022⁴). On the website of the Förderkreis, there are regular announcements for online lectures, held by different experts on a variety of topics connected with vegan agriculture. These are free for anyone to join (Förderkreis Biozyklisch-Veganer Anbau e.V., 2022⁴).

Considering the above-mentioned activities, it can be derived that the BCVF movement puts high importance to learning within as well as beyond the niche, making use of a wide variety of means to spread knowledge. The passing on of factual information as well as learning that gives incentives for questioning the socio-technical regime can be found in the learning activities conducted by the BCVF movement, depending on the context in which knowledge is spread. Adaptation of informational material to the target group ensures that all people, disregarding their prior knowledge on the subject, are given access to the concept. Actual teaching of the methods via educational programmes for potential producers or other interested parties, is being expanded but so far still very limited, posing an obstacle to the approach's further development and practical implementation. Knowledge that stimulates to question the socio-technical regime, in that case why BCVF is needed in the context of current agricultural developments, is mainly spread amongst interested people new to the topic, as it is apparently assumed that those who have been familiar with it for a longer time, are aware of the shortcomings the mainstream (organic) agricultural system.

CSA

As explained on the CSA network's website, "lively and dynamic learning processes"⁷ (Netzwerk Solidarische Landwirtschaft e.V., 2022¹) form part of CSA. Similar to BCVF, the idea is that people within the movement and different CSA projects learn about methods and concepts from each other, as well as spreading this knowledge and information outside the niche (Interviewee 4). On the network's website, different offers can be found regarding education in the field. There are courses in organic vegetable growing as well as programmes giving an introduction of the economic system of CSAs and the planning and conduction of the concept (Netzwerk Solidarische Landwirtschaft e.V., 2022³). Furthermore, there are several possibilities for obtaining consultation from experienced CSA workers within the network and contacts are listed of external consultants specialised in specific fields, that work with CSAs (Netzwerk Solidarische Landwirtschaft e.V., 2022²). On the website, informational material in forms of flyers, posters and brochures, where basics of the CSA concept are explained can be accessed, downloaded or ordered (Netzwerk Solidarische Landwirtschaft e.V., 2022¹¹).

In the past years, two online courses were held for the first time. Online courses save travel expenses and time and since the offer was well-received by participants, the network is planning to continue with this method of teaching (interviewee 4). The network is also regularly asked to participate in panel discussions or hold presentations on the topic of trade or new economic models, which is always a chance for CSA to bring in its viewpoint and explain the concept (Interviewee 4). Another educational aspect is directly targeted at the CSA members, who usually support the team on the field several times a year, experiencing how agriculture is done and have the chance to learn about the methodologies and concepts behind it (Netzwerk Solidarische Landwirtschaft e.V., 2022¹⁰). This also seems to generate more understanding amongst the members for the value of the grown products and the consequently higher pricing (Interviewee 1, 2, 4, 5a). The type of knowledge that is given in the informational material and courses is context dependent. Courses for future producers are mainly focused on the internal workings and structuring of a CSAs, other seminars focus on the methods of organic vegetable growing (Netzwerk Solidarische Landwirtschaft e.V., 2022³).

CSA uses a variety of different media to enhance learning and spread knowledge. Learning forms, not only theoretically but also practically, a main pillar within in the CSA movement. Not only by giving information but also through offering their members the chance of first-hand experience in the field of agriculture, the appreciation for agricultural goods that might be developed amongst the members, could form a starting point for questioning the often very different agricultural realities in the socio-technical regime. Though CSA members might often be critical towards mainstream farming already, hence the CSA membership, this scepticism may be strengthened and spread by a proper understanding of alternative agricultural possibilities and the involvement with niche actors. Factual information, via courses and programmes is thus spread and the practical learning experienced by CSA members may stimulate them to questions the regime. It is these different kinds of learning that are considered crucial for niche development (chapter 3.1) and both are rooted in the CSA concept.

⁷ Own translation

5.2 Overlaps and discrepancies with the socio-technical regime

5.2.1 Livestock farming

Currently, livestock farming and everything it entails forms a firm component of the socio-technical regime. BCVF and CSA have a particular view on the position, manner and importance of livestock and it is thus one of the main discrepancies between the niches and the regime. There is a rising number of CSAs that practice vegan agriculture on their farms and the majority of non-vegan CSAs does not keep livestock. Those that do, take considerable pains to ensure animal welfare, usually exceeding mainstream organic standards (Netzwerk Solidarische Landwirtschaft e.V., 2022¹). BCVF takes a more drastic stance in excluding livestock from the farming circle completely, which is why its standing and importance in the regime is particularly significant to observe regarding the potential development of BCVF.

In the past years there has been a great increase in awareness in society for animal welfare as well as the negative impacts of livestock farming on the environment and the climate. This amongst other factors, led to a rise of veganism and vegetarianism in Germany (Proveg International, 2022). While in 2008 about 80.000 people in Germany claimed to follow a vegan diet (VeggieWorld 2022), in 2020 the number reached 1,41 million, rising by 280.000 from 2019 alone (Pawlik, 2022¹). Regarding vegetarianism, numbers are considerably higher and have also been going up. In 2021, 7,5 million people called themselves vegetarians, the number having risen by one million in 2020 (Pawlik, 2022²). Moreover, people that do not identify themselves as being strictly vegan or vegetarian have also been consuming less meat in the past years and average meat consumption in Germany has been slightly decreasing, dropping from an average of 57,1 kg per person in 2019 to 55 kg in 2020, reaching its lowest level since 1989 (Weltagrarbericht, 2022). The trend is likely to continue. According to a nutrition report conducted by the company Veganz, round 50% of people in Germany stated that they intend to reduce their consumption of animal products in future and 80% of vegetarians intend to become vegan eventually, which though a vague statement, shows that awareness exists (Veganz, 2022). The magazine *Fleischatlas* conducted a survey regarding reasons for veganism and vegetarianism and concluded that meat consumption is frequently linked to political orientations and ethical values. The majority of vegans and vegetarians in Germany also forms part of the climate movement and more than half support measures combating food waste. The working conditions in the meat industry, the climate as well as animal welfare and animal rights are the most frequent reasons for consumers to choose to reduce or cut out meat and animal products in their diet (Spiller et al, 2021). Consequentially, the consumption of and the market for vegan products has been growing drastically in Germany in the past years. Between 2018 and 2020, sales of vegan products almost doubled, increasing by 97%. Plant-based milk is the most popular vegan alternative amongst them with revenues adding up to 400 million EU in 2019 (Proveg International, 2022).

Not only on the individual level has a vegan or vegetarian diet become a significant topic, politics is also concerned with the subject. The German environmental authority advocates a drastic reduction of meat consumption for the sake of climate and animal welfare issues (Zweites Deutsches Fernsehen, 2021). In this context, vegan agriculture has been recognised as a climate compatible alternative by the government's scientific advisory board for global environmental change (WBGU, 2020). In 2019, the federal climate cabinet was instructed to develop a set of measures to reduce CO2 emissions in order to reach national climate goals. They urged for a drastic reduction of livestock in Germany, naming it as one of

the main causes for emissions. A thorough study by the *Öko-Institut* published in 2019, confirmed this, stating that the only way to reach the climate goals is to scale down on livestock farming (Pressenza, 2019). Interviewee 3 views these public acknowledgements as positive developments for a more prominent future role of Biocyclic-vegan farming stating, “agricultural politics is developing towards promoting organic farming, for environmental politics it is very clear that livestock has to be reduced, that means if agricultural and environmental politics keep moving in those directions, they will eventually end up at Biocyclic-vegan farming”⁸. The shift towards the expansion of mainstream organic farming on the one hand and environmental pressures on the other, is thus seen as an opportunity to assert changes and put forward new ideas. In their future strategy of organic farming, the federal ministry of nutrition and agriculture states to aspire a “qualitative further development of organic farming...future strategies are about strengthening the sustainability potential of organic farming” (BMEL, 2019; p. 22). This shows that there is general willingness to change and adapt mainstream organic farming guidelines which creates possible room for new approaches.

The above outlined developments indicate that there might be room in the future for BCVF and CSA to put their ideas forward and contribute to reshaping mainstream organic farming away from intensive livestock farming. However, although awareness about livestock contributions to climate change in society has been increasing, considering the overall population of Germany, it is only a fraction who hold this awareness and reflect it in their behaviour. 7,5 million people that follow a vegetarian lifestyle is after all less than 10% of the overall population, let alone vegans that amount to less than 2% (Pawlik, 2022¹). An acceptance in society of vegan farming on a larger scale is therefore still slight. A major part of society regards meat as a main component of their nutrition which is rooted in our culture and traditions. Many also see the social sides of meat eating such as barbeques. Researcher on societal change Mark Kovic points out a so-called “meat paradox” (2020), meaning that the majority of people claims they do not like harm being done to animals, yet they eat them and support mass production of meat (Kovic, 2020). Most omnivores regard eating meat as “normal, natural and necessary” (Joy, 2009; p. 96), which is how social psychologist Melanie Joy summarises it in her book “Why we love dogs, eat pigs, and wear cows”. She further explains that changing these assumptions is extremely difficult since they are not based on rational thinking but on culturally entrenched habits (Joy, 2009).

Groceries, including meat or other animal products, are cheaper in Germany than almost anywhere else and it seems to be that, which essentially matters more to Germans than quality. While in France people spend about 30% of their salary on food, in Germany it is only 13% (Schneider, 2020). Despite recent trends, Germany is a meat-eating nation and produces more meat than any other EU country. The meat industry is thus still a huge economic sector in the country (Zeißig, 2020). Even though meat consumption has decreased slightly in the past years, it lies still above the recommendation of the German Society for Nutrition DGE (DGE, 2019) and despite the recent lower consumption levels, meat production in Germany is still increasing (Zeißig, 2020). Regarding the pork industry, 20% more pork is produced than the country consumes and living pigs are regularly imported into Germany and exported again after slaughter. It is the former agricultural minister Horst Seehofer who made this profitable for producers in 2007 by introducing subsidies even for farmers who could not prove they have the means to maintain livestock and dispose of

⁸ Own translation

excrements properly (Zeißig, 2020). The industry's reaction towards the decreasing demand in meat seems to be an extension of the export market, aided by political subsidies.

Regarding the attitude towards livestock farming, overlaps as well as discrepancies are found between BCVF and CSA and the socio-technical regime. A growing part of society shares the values of ethical treatments of animals and a desire for more environmentally friendly agriculture, which is expressed through a vegan or vegetarian diet as well as activism. The issue has also entered into political discourse and the need for the reduction of livestock has been recognised, yet no concrete political steps have been taken. These developments show overlaps with the niches' ideals and might open up windows of opportunity for them to become more influential. On the other hand, the economic importance of the meat industry as well as the still deeply entrenched habit to eat meat in the socio-technical regime, are currently still posing major obstacle to the emergence of the niches.

5.2.2 Locality and seasonality of products

Regionality and locality of foods generally seem to play a sub-ordinate role in the socio-technical regime, though the trend is slowly changing (BMEL, 2020). It is however of great importance for BCVF and especially CSA, it being one of its main distinguishing features (Netzwerk Solidarische Landwirtschaft e.V., 2022¹). The so far relatively low number of BCVF certified farms might make the bridging of longer distances necessary for now, in order to increase extension and development of the approach. Since certified farms are predominantly located in the German-speaking area transportation ways are still kept fairly moderate. Regarding the future development of BCVF however, it is desirable to consider the issue of locality (Siebert, 2022).

Similar to the trends towards vegan and vegetarianism, a trend towards the preference for local and seasonal products amongst consumers has been developing in the past years. According to a survey by the market research institutions Forsa, 83% of Germans state that it is of importance to them that their food is grown in the region and seasonality is becoming an increasingly important issue as well (BMEL, 2020). Almost 70% wish for an expansion of the offer of regional products in supermarkets (Ipsos, 2018). Experts explain that this trend developed partly due to the Corona crisis which started in 2019 and during which more people started cooking at home again and consequently paid more attention to the kind food they buy (BMEL, 2020). Furthermore, the increasing awareness of environmental challenges makes consumers appreciate short transportation ways. The new appreciation for regional foods as well as regional dishes has been called, "the answer to the globalisation of our food system and the anonymisation of food from all over the world that comes with it"⁹ (Rützler, 2021).

The climate is, however not the only reason for the newfound interest in regionality and seasonality since it is not geographical closeness alone that seems to matter. Regionally grown foods as well as organically certified products are often associated with higher qualitative and social standards in food production and processing. Consumers increasingly wish for more transparency regarding the origin, production and processing of their food (Rützler, 2021). The term regional however, is not officially defined or protected and can be understood differently, meaning for example the city, the state or even the country.

⁹ Own translation

Moreover, the term often does not differentiate between growing or processing of food. It might be processed and packaged in the area but is grown abroad and can legally still be marked as regional. Supposed regionality does hence not ensure ecological, qualitative and social standards, even though this often seems to be assumed (Verbraucherzentrale, 2022). The same happens the other way around; the organic logo is by many consumers taken as an indicator for regionality. Since the demand for organic products in Germany surpasses the country's production however, many organic products are imported from outside the country and often outside the continent and are thus anything but regional (Dallmus, 2021). There is a certain lack of transparency which is often misleading and causes confusion amongst consumers (Verbraucherzentrale, 2022). Journalist and book author Katarina Schickling explains that this is why buying local products can sometimes be more impactful regarding climate than certified organic foods, due to shorter transportation ways. Furthermore, through geographical closeness, consumers have the possibility to reassure themselves that the products are produced in an environmentally compatible way without the need for a logo (Dallmus, 2021). This transparency is exactly what CSA can guarantee by connecting farmers and consumers in the most direct way. Interviewee 5a explains that providing full transparency for their members is a central part of CSA: "If it is going well, they (members) are regularly on the field, get to know us, know who is growing their vegetables and know for whom they are buying more expensive vegetables, so that we get paid adequately"¹⁰. This often increases the willingness to pay a higher price (Interviewee 5a). With goods available in the supermarket, this transparency is not given and regionality in accordance with social and qualitative standards is costly and not all consumers are willing to pay for it. According to a study by the market research institute Ipsos, only about half of Germans are willing to pay an increased price for products that maintain ecological and social standards. When it comes to regionality, the willingness is even lower with only 38% percent of consumers that state that they would pay more for products that are grown and processed in the region (Ipsos, 2018). This is also an issue many CSAs encounter in their daily business. The prices of products vary depending on the CSA and often economic conditions of members are taken into account, yet all experts report that pricing is a frequent point of discussion (Interviewee 1, 2, 4, 5a, 5b).

Another aspect is, that there is still an ongoing demand for fruits and vegetables that are out of season or grown in tropical climates such as avocados, mangos or lemons which local farmers cannot produce. To sell them as freshly as possible, many of these are imported by plane, organic as much as conventional, which causes 50-100 times more emissions than foods imported by ship (Menn, 2020), social standards are often low and transparency decreases with global trade (Rau, 2021). Consumers would need to adapt their eating habits if an increased focus on seasonality and regionality is to be achieved in the food system. Nevertheless, even growing those products locally that can be grown locally, is currently difficult. Apart from the pricing, space poses another obstacle to this endeavour. Potatoes, grains and sugar are the only foods at the moment where the country relies solely on national production and that being mainly conventional, for everything else, imports are necessary (Dallmus, 2021). For an increase of local production of other products more agricultural land would need to be provided, or the use that farmland is put to would need to be reconsidered, which puts into question, again, the issue of livestock.

There is a shift taking place in the socio-technical regime towards increased importance of locality and seasonality of products, triggered by consumers' preferences and partly

¹⁰ Own translation

responded to by the industry. However, though the term “regional” is more frequently used by producers, origins of foods are often still untransparent and consumers turn to certified organic products hoping to support local agriculture which is often not the case. The increased appreciation for regionality and seasonality is a clear overlap between the niches’ values and the socio-technical regime which might increase support on the consumer level, especially since there are currently few reliable choices on the market. Regionality and seasonality however, demand a change in eating habits as well as willingness to spend more money on food. These expectations deviate from the socio-technical regime since currently the majority of consumers is deterred by higher pricing of regional products and enjoys imported goods.

5.3 Global developments

5.3.1 Global societal and political developments

There are several societal and political developments on the socio-technical landscape that might influence agricultural systems on a global and hence possibly on the regime level as well.

Unlike the trend within Germany, consumption of meat and other animal products world-wide is still going up (Levitt, 2021). Global meat consumption has risen from 41,5 kg per person in 2010 to 43,2 kg in 2019 and production is consequently going up as well (Statistisches Bundesamt, 2022). Regarding this development, it is important to distinguish between western and non-western countries since trends go into different directions. In countries of the western world, developments reflect those that can be observed within Germany, namely a newfound interest in veganism and vegetarianism leading to slight decreases in the consumption of animal products (The vegan society, 2022). There has been a change of the image of veganism in the past years, from very sceptical to a much more positive reception, making it easier for consumers to pursue that kind of lifestyle (Minassian, 2022). Globally, in the countries of Germany, Austria and the UK, veganism was most popular in the year 2021 and opted for mainly due to environmental reasons. Consequently, companies that produce meat and other animal product substitutes have been expanding world-wide (The vegan society, 2022).

There has been a strong international climate movement coming from civil society consisting of different organisations and groups working towards increasing environmental awareness in society globally. The crucial role of agriculture in environmental degradation and global warming seems to become an increasingly dominant topic of their environmental activism. The Fridays for Futures movement sent a letter to the EU in 2020, demanding the transformation of agricultural politics to protect biodiversity, since the movement recognised that the CAP is an essential element in solving the climate crisis (Corbett, 2020). The Fridays for Future movement has also been said to have become a central driver for plant-based diets (Spiller et al. 2021). Furthermore, there are numerous other organisations promoting a vegan lifestyle and thereby exerting influence on consumers’ choices of products and hence agricultural demand. The organisation „veganuary“, which was founded in 2014 in Great Britain, inspires people from countries all around the world to try a vegan diet for the month of January each year. It also promotes vegan products and menus and fights for environmental protection and the abandonment of animal farming. It has already gained

public acknowledgement and praise from celebrities such as Paul McCartney (Veganuary, 2022). There are vegan events world-wide, virtual and physical in different places, informing about benefits of vegan lifestyles and ways to realise it (VegEvents, 2022).

Reflecting the trends within western society, discourse about climate change and sustainability has been increasing in global politics as well and has been acknowledged as a global issue since the later decades of the 20th century. As a consequence, international conferences have been held and organisations and institutions have been formed, which has been estimated to be a first step towards effective environmental action (O'Neill, 2017).

The topic of agriculture in connection with the environment has also become a central topic of the European Green Deal. The EU commission states that the Green Deal aims to, “reduce the environmental and climate footprint of the EU food system” (European Commission¹). Since its introduction in 2019, some action has been taken. The European Climate law was passed, which has made the EU’s 55% emissions reduction targets legally binding for member states and the EU Code of Conduct on responsible food business and marketing practices has been signed by 65 organisations, aiming to increase the availability and affordability of healthy and sustainable food options (Belardo, 2021). The EU states that it wants the CAP to “become the global standard for sustainability” (European Commission¹). Ambitions at the EU level are well-received at the national level in Germany and the government stated to recognise the CAP as an essential tool for enhancing sustainable agriculture and wholeheartedly supports the development of measures regarding increasing environmental compatibility (Bundesregierung, 2021).

Beyond the EU level, environmental measures have been negotiated amongst nation states mainly in the regular Conference of Parties meetings (COP). At COP 21 in Paris in 2015, lowering CO₂ emissions by nationally determined amounts has been agreed upon. In which sectors the reduction of emissions is to take place is up to the nation states but it has been estimated that if their goals are to be achieved, most countries will have to take the agricultural sector into account (CAP Energy and Environment Team, 2016). Agriculture is not specifically mentioned in the Paris Agreement but it has been recognised that agriculture holds a lot of potential for CO₂ reduction and the vulnerability of the food production system, the role of food security and hunger were addressed, which hints towards the necessity for agricultural change. The Paris Agreement does not however, urge for the adoption and implementation of climate smart agriculture policies (Verschuuren, 2016).

In subsequent conferences, agriculture was addressed a bit more explicitly. At COP 23 in Bonn in 2017, the ‘Koronivia Joint Work on Agriculture’ (KJWA) was adopted which provides a road map to address issues related to agriculture in a holistic manner through a series of international workshops on the topic. KJWA has been called a “milestone for negotiations in agriculture” (Dinesh et al, 2017). Topics addressed in KJWA were amongst others an improved nutrient use and manure management towards sustainable and resilient agricultural systems as well as improved livestock management systems (Dinesh et al, 2017). In 2021, at COP 26 in Glasgow, the progress of KJWA was discussed by the involved governments, resulting in mainly positive feedbacks and governments acknowledged the problems in agriculture (United Nations Climate Change, 2021). It was reported that awareness exists also regarding livestock farming, “It was also recognised that while livestock management systems are vulnerable to climate change, improving sustainable production and animal health can contribute to reducing greenhouse gas emissions while enhancing sinks on pasture and grazing lands” (United Nations Climate Change, 2021). The

Guardian on the other hand, criticised that agriculture was not stressed enough and not given adequate importance as it was rather overshadowed by forestry. Politicians, “failed to engage with politics of sustainable food production head-on” (Weston & Watts, 2021) and topics of sustainable diets, cutting meat consumption, livestock and dairy, and the topic sustainable food systems were completely omitted (Weston & Watts, 2021). The global meat industry is a powerful actor, which does not welcome anti-livestock climate and fears the consequences of agricultural policies. Meat and dairy companies in the US apparently spent millions to undermine climate policies (Gustin, 2021) and livestock farmer groups are said to have been lobbying the UN before the UN Food System Summit taking place in New York in 2021 (Kevany, 2021).

Societal developments on the socio-technical landscape partly reflect what is happening at the regime level within Germany. Environmental protection has become a more widely spread value and environmental movements increasingly stress the issue of agriculture in environmental discourse and veganism and vegetarianism has become increasingly popular in the western world. Global politics address the topic of agriculture but currently still seem to avoid taking concrete measures to increase its environmental compatibility which might also be partly due to the power of the meat industry. On the EU level however, agriculture has become a more prominent issue and as one of its member states, Germany will be directly affected by resulting policies, which will influence the socio-technical regime.

5.3.2 Global Crises

Recent events that have affected the global community on several levels, such as the Ukraine war and the Covid-19 pandemic might also have influence on agricultural systems. Russian’s invasion of the Ukraine and the resulting war that has been going on since February 2022, brought new considerations to the endeavour of sustainable agriculture. The EU sees its food security threatened since the crop import from Ukraine, on which Europe relies, might be impeded (Cwienk, 2022). The sustainability goals of the new CAP are thus questioned, and considerations have been uttered to put the plan of increasing the amount of organic agriculture on halt and focus instead on boosting agricultural output. On the other hand, the question of livestock farming is brought back into the debate and it has been pointed out that if less land was used for growing feed for livestock, more could be used to grow crops for direct human consumption, replacing imports otherwise coming from Ukraine (Cwienk, 2022). Furthermore, it has been recognised that the crisis has shown how important resilience and self-sufficiency in agriculture is, which is why switching to organic farming is by experts considered more important than ever. Following this line of thinking, investment in local territorial infrastructure and food production is now paramount (Moore, et al., 2022), which might open up spaces for local, small-scale and sustainable agricultural approaches such as BCVF and CSA.

The Coronavirus pandemic which broke out in early 2020 put many economic and social activities around the world on halt. As a consequence, it also shows the dependencies and vulnerabilities of the global food system (Neuhaus u. Wang. 2020). Germany experienced a lack of migrant workers for seasonal work in 2020 and 2021 which influenced especially the agricultural sector. Many crops such as strawberries and asparagus could not be harvested (Wallasch, 2020). This puts in question the economic and social structures of the global food

system and speaks for shifting economic agricultural structures towards a more regional level. The pandemic seems to have pulled citizens more towards the local and local and regional products have gained in popularity (chapter 5.2.2). Surveys have shown that people buy more fresh vegetables than before the pandemic and that cooking healthy has gained importance. A stronger decrease in the consumption of meat can also be seen which might to be connected to the political discourse regarding conditions in and the state of slaughterhouses. The deficient hygienic conditions in slaughterhouses itself as well as the accommodation of workers turned out to be one of the major hotspots for spreading the virus (Deutsche Welle, 2022²).

The Ukraine war as well as the Corona pandemic bring new dimensions into several developments on the socio-technical landscape which are also reflected on the regime level. If these will turn out favourably or pose an obstacle to the emergence of BCVF and CSA is currently unclear since indicators for both possibilities are found.

6 Conclusion and Discussion

6.1 Conclusion

Within the frame of the first sub-question, whether the internal workings of BCVF and CSA show potential for successful niche-growth, the elements visions and expectations, networking and learning are considered. On the base the finding laid out in chapter 5, it can be concluded that both BCVF and CSA show potential for successful niche growth and development since they largely fulfil the necessary key elements that are identified in SNM literature (chapter 3.1). However, there are still major obstacles regarding resources and especially the discrepancies with the socio-technical regime when it comes to lifestyle changes that the realisation of visions demands.

The consideration of shared visions leads to the socio-technical regime. The extent to which visions are shared, also represents overlaps with the regime since this means, there is support for the concepts. The results found regarding shared visions are therefore also reflected in the analysis of overlaps and discrepancies with the socio-technical regime. The second sub-question inspects the issues of livestock farming and locality and seasonality in the regime and their compatibility with the methods and values of BCVF and CSA and overlaps as well as discrepancies are found. At the moment, the discrepancies with the regime seem to pose major obstacles to wider dissemination of the niches' concepts. However, several developments can be observed supporting their ideals and if these continue to grow, new opportunities for the niches might arise.

Moving to the wider context of the socio-technical regime, societal and political developments and global crises on the socio-technical landscape are analysed. Similar to the regime level, further development of existing movements promoting similar values to BCVF and CSA, might positively influence the chance of emergence for the niches in the regime, since this is under the influence of the socio-technical landscape. Global environmental politics mostly fail to address the topic of agriculture directly even though concrete agreements could pressure politicians in the regime to take appropriate measures. The EU's agricultural efforts however, are mirrored in national policies which further contributes to a possible window of opportunity for the niches. Current global crises triggered new debates regarding agriculture as well as

food trends. If these eventually play out favourably or disadvantageous for the emergence of the niches remains to be seen.

Figure 3 shows some factors identified that have a direct or indirect influence on the possible emergence of BCVF and CSA, correlations between them and their position in relation to the socio-technical landscape, the socio-technical regime and the niches.

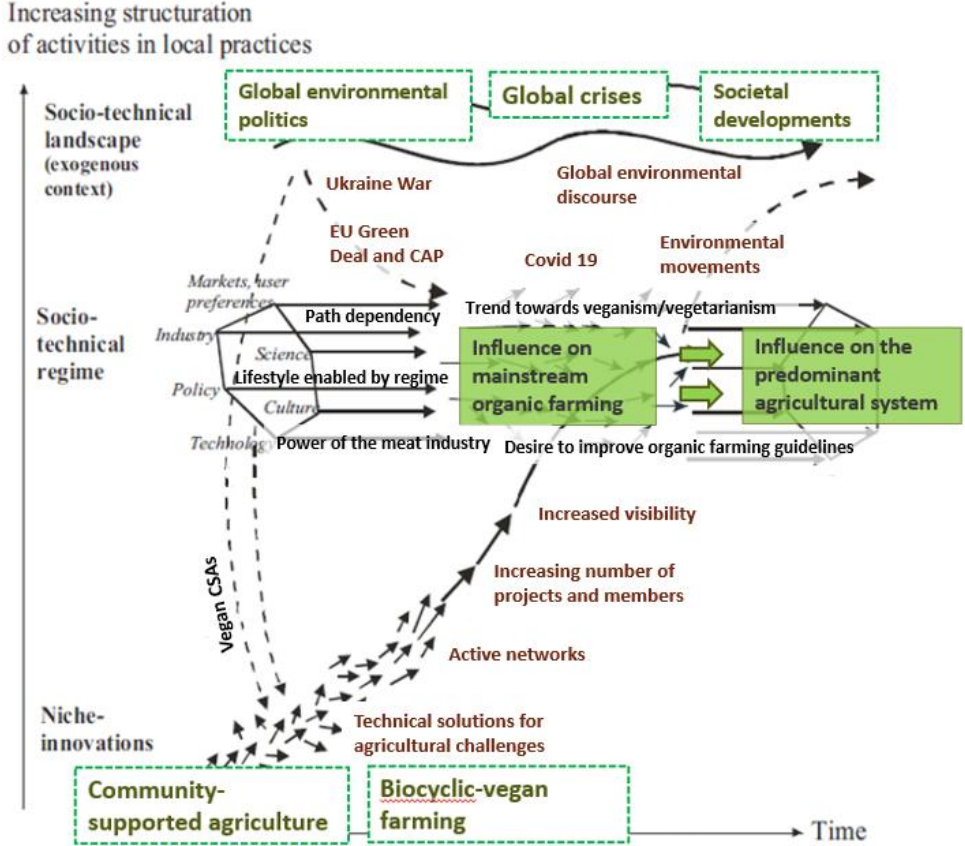


Figure 3: Elements that influence the emergence of BCVF and CSA (adapted from Geels, 2002)

The main research question of this paper asks what the opportunities and obstacle for BCVF and CSA are in playing a more prominent role in shaping the mainstream organic farming scheme in Germany. On the base of the findings of the three sub-questions several concrete opportunities and obstacles regarding the niches' emergence and subsequent chances to gain influence regarding the improvement of mainstream organic agriculture can be identified. Considering opportunities, both niches, judging by their activities and the degree to which visions are shared, display potential for successful niche growth and emergence. The role of agriculture in environmental degradation has entered into global discourse pressuring the socio-technical regime. Shortcomings in standard organic agriculture, which is often seen as a solution, have been recognised by the German state which expressed the intention to continuously improve mainstream organic farming. Both BCVF and CSA offer technical and conceptual solutions for recognised agriculture related challenges and have consequently been acknowledged as highly sustainable approaches. The desire in the regime for

increasing sustainability in mainstream organic farming might thus open a window of opportunity for alternative solutions coming from the niche level, to gain attention and support in the regime.

A major obstacle currently standing in the way of BCVF and CSA however, is a lack of financing with which both niches are struggling and which slows down their development. The potential for growth, which undoubtedly exists, can thus not be fully embraced. In spite of recent trends, severe mismatches with the socio-technical regime are a further obstacle to the potential influence the niches can gain. Their concepts, if fully embraced, eventually require changes on the consumer level which do not correspond with the realities in the socio-technical regime. Not only do individuals need to adapt their lifestyle to a certain extent but politics needs to put environmental interests above economic ones regarding the food industry, in order for the ideas of BCVF and CSA to be accepted beyond the niche level. Despite anticipated changes in global as well as national agricultural politics, maintaining the status quo still appears to be a priority.

For the BCVF and CSA concepts to gain a more prominent role in shaping mainstream organic farming, a structural as well as cultural shift is needed. Changing cultures however is long and slow process (Alexander & Gleeson, 2018). The change in consciousness regarding the environment and resulting environmental movements, that are developing on the landscape level and in the socio-technical regime simultaneously and interdependently, open up potential spaces on these levels for approaches such as BCVF and CSA, and both niches have grown in the past years. Neither of these developments represent the mainstream of the regime, yet they are working towards influencing it on different levels. Niches can be crucial for change when it occurs in interrelation with changes occurring beyond the niche level (chapter 3.1). This seems to be happening regarding conventional and organic farming. However slow the process currently seems, promising developments can be found on all three levels.

Regarding possible trajectories of the niches, the severe discrepancies with the current socio-technical regime, make it unlikely that either of the niches will eventually fully replace the current organic farming scheme but if they keep growing, there may be a possibility for them to spread alongside it. They might thus continue to draw the attention and support of those, who are not satisfied with standard organic farming and contribute to overall sustainability in the agricultural sector by supplying these consumers with foods from a highly sustainable source. If environmental compatibility is to be improved in the organic farming sector, as it has been stated, the niches' concepts and methods might also be looked upon as role-models and parts of them could be incorporated into the mainstream such as an increased use of plant-based fertiliser on organic farms or measures to enhance biodiversity.

Organic farming itself started out as a niche movement in the mid-20th century (chapter 2.1) and was received very sceptically since agriculture without the use of chemicals and pesticides was unthinkable at the time (Vogt, 2001). Initial deviations from predominant assumptions do therefore not mean, that a niche is doomed to fail but it might simply take time for its ideas to be accepted. Especially BCVF which is operating within the existing system by creating a certification scheme that is officially accredited, might go through similar development stages as organic farming initially did.

The concept of CSA has existed since about 60 years, much longer than BCVF (chapter 2.3) and yet it has not moved beyond the niche level. However, the drastically rising number of CSAs in the past years (chapter 5.1.1) indicates that this development might be linked to the growing environmental movements and an increase in the awareness of agricultural

shortcomings. If these developments continue, chances are high that the number of CSAs will keep increasing.

6.2 Discussion

Agricultural approaches spanning through different sectors in order to achieve the highest possible sustainability balance have not been given adequate academic attention considering their potential (chapter 1.4). Both the concept of BCVF and CSA go beyond focusing on agricultural methods alone and the realisation of the concepts requires adjustments in other sectors as well. This study hence gives an insight into the development and emergence of these approaches, determining obstacles and opportunities on their way to more prominence. The inclusions of a variety of sectors in the path towards higher sustainability is also what is called for by the Academy of Science Leopoldina, which states that a macrosocial shift towards a more sustainable agriculture is required (Deutsche Akademie der Naturforscher Leopoldina e. V, 2020). The analysis of the BCVF and CSA concept illustrates in how far restructuring of agriculture can be interdependent with changes in related spheres and the difficulties that consequently arise. These findings can be used to guide decision-makers in the endeavour to initiate a broader agricultural and societal shift.

Innovative approaches for sustainability are also what the government builds on in its climate protection plan which was released in 2019 and concerns all sectors, including agriculture. The government states, “We need new approaches for pushing forward societal change towards emission-free action”¹¹ (Bundesregierung, 2019; p. 164). It furthermore calls for holistic approaches surpassing sectorial thinking and support and encouragement for actors of all backgrounds to enhance a transformation towards increased societal sustainability (Bundesregierung, 2019). This study introduces two such approaches which start with the agricultural sector, one of the most problematic regarding sustainability, and from there deduce necessary societal and economic changes in order to realise their sustainable concepts. The results can be used for politicians to get an overview of what holistic approaches can look like and arising problematics they entail. Appropriate consideration can thus be taken in political action.

B. Loke, global food lead scientist from WWF emphasises the value of grassroots initiatives regarding food system changes but also urges to draw bridges between different levels of action stating, “We need to start connecting the top and the bottom...but if we don't have an international multilateral process to support it, it is not going to be enough. We cannot rely on individuals to do the work.” (Loke in Gray, 2021). Grin et al. (2010) state that niche approaches that stem from a grassroot level have been researched little in comparison with technological innovations. The insights into the realities of niche emergence regarding BCVF and CSA can thus contribute to bridging the gap between bottom-up and top-down approaches. This study shows that the emergence of new sustainable approaches cannot come from the grassroot level alone. Politics can open up great opportunities for niches by subsidising or promoting new methods and approaches. At the same time, the lack of this as well as holding on to longstanding values and priorities can pose a huge barrier to approaches that promote innovative thinking. By illustrating the interdependencies with bottom-up approaches and the top, understanding for the necessity of support might be fostered, possibly leading to political action.

¹¹ Own translation

In the context of emergence and development of BCVF and CSA, further research could be conducted on how the gap between alternative agricultural approaches such as BCVF and CSA and the mainstream could be bridged. In current food trends, consumers' preferences in many cases correspond with what the niches are able to offer and there might be more potential to gain support. Yet alternatives to mainstream organic products and their increased environmental benefits are often not known to the average consumer.

In order to gain supporters beyond the sphere of alternative agriculture and environmental activism, knowing more about stigmas surrounding certain foods as well as the nature of habits and practices might give useful information on how to promote and frame the niches' ideas. Another subject for research might thus be to study eating habits of consumers and values connected with them.

Investigating realities regarding the power and influence of the meat industry is another topic in which future research might be conducted. Even though it has been widely acknowledged that a reduction of livestock is imperative on a path towards increased sustainability, the legal situation in Germany currently seems to reinforce intensive livestock farming and the environmental effects it entails, thereby also encouraging consumers choices for an animal-based diet.

6.3 Critical reflection

Due to the wide variety of factors considered in the study, the analysis remains focused on the most prominent issues, giving an overview of the factors that are of importance regarding the different sub-questions and which role they play or position they take in the issue. Due to the frame of the study however, a more detailed and differentiated analysis of these factors could not be done, by which certain nuances might be lost. Regarding issues such as the role of value systems, socio-economic contexts and pricing or the power of the meat industry, could be given more attention. Although the analysis still captures the most important points within these topics, interesting additional information, painting a more differentiated picture regarding potential obstacles and loopholes and possibly opening up connections to other topics that might play into the issue, is not included.

The MLP which was used as the main theoretical background is a complex theory aiming to provide a holistic and detailed picture of possible niche emergence. It serves well in the context of this study to answer the research question adequately and ensure all relevant considerations are taken into account. Nevertheless, in order to analyse the different factors more extensively, it might have been more beneficial to focus on one part of the MLP, e. g. the socio-technical regime, and determine obstacles and challenges within this level, thus being able to give more detail on relevant information and back up arguments more thoroughly.

Another possibility would have been to look at only one case instead of two, which might have been more suited to the frame of this study. Both BCVF and CSA are emerging niches however, which play an increasingly important role in the alternative agricultural field focusing on different relevant agricultural issues and for a reshaping of mainstream organic agriculture both alternative approaches were considered valuable.

A more detailed distinction between different kinds of BCVF and especially CSA, since the concept can be realised in various ways, and the motivation behind them, could give a more differentiated picture of the approaches and hence possible interplays with the context they are in. Due to the frame of the study, specific implementations of the concepts and their

specific possible trajectories were omitted.

The desk research proved to be a useful method for this study since all needed information could be found and the wide variety of sources available, e.g. documents, newspapers, reports, made it possible to analyse the topic considering various viewpoints. Yet, a lot of information that is easily accessible comes from questionable sources and it often took further research to determine its credibility, complicating the research process.

Even though the analysis of the different issues is not as extensive and detailed as it could be, it is able to provide a holistic picture of the niches and the context in which they aim to emerge. All developments that are estimated relevant on the base of extensive research, are included in the study and the role they play regarding the niches' possible emergence is made clear. It needs to be kept in mind however, that all of these factors might be influenced by other developments on different levels and drawing conclusions regarding future emergence of the niches is challenging considering the complexity of interdependent factors and the constantly changing political and social environment.

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Appendix 1: Interview manual

The interview manual and the specific formulation of questions is originally in German since all interview partners are German speaking and the interviews were conducted in the same language. For an overview of the topics covered, the manual was translated to English by the author.

Intro:

- Introduction
- Explain what study is about
- Permission to record

Questions regarding:

- General background
 - Importance of approach/why it needed
 - Development of the concept in the past years (internal structures, number of projects, image)
- Specific workings
 - How is publicity work carried out/acquisition of new members?
 - Partner organisations and importance of such cooperation
 - Importance of learning; specific programmes (content, effects, target group), future plans
 - Points of criticism coming from members/the public
- Relation with the regime
 - Difficulties that are most frequently encountered in the realisation and expansion of the concept (financing, consumers' attitudes, legal regulations, ...)
 - Developments in the past years that turned out favourably for the expansion of the concept (societal trends, political measures, ...)
 - The movements ambition or ultimate goal → is it conceivable?
 - Estimations on future developments of the approach
- Organic farming
 - Organic certification needed in concept? Why (not)?
 - Challenges in mainstream organic farming → do these not exist within the concept? How are they avoided?

- The government's plan to increase organic farming to 20% → advantageous for the approach?
- Estimation of chances for the approach to gain influence on a higher level → prospects of political support?

Closing

- Questions from interviewee
- Giving thanks