Transition towards a sustainable food system?

An analysis of sustainable food initiatives in the rural district of Augsburg

Anna Frede

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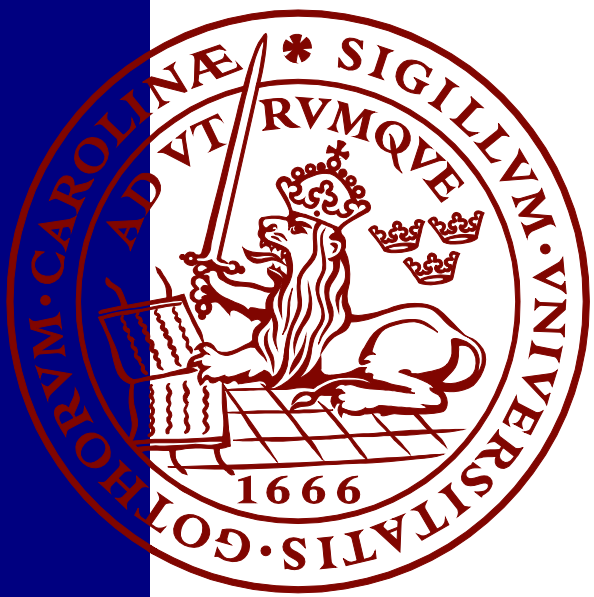

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Abstract

In today's globalised economy, food system actors seek to introduce more sustainable structures in terms of alternative food systems, including short food supply chains, local food systems and organic food production, to reduce environmental impact and achieve social benefits. Using the Multi-Level Perspective to analyse expert interviews and the results of a citizen survey, this thesis explores the current status, barriers and opportunities for initiatives trying to improve the distribution of sustainable food in the rural district of Augsburg (official German name: Landkreis Augsburg). It is found that the main barriers against efficient distribution relate to logistics/infrastructure, regulations and customer preferences. These can be addressed at all levels of the Multi-Level Perspective by different actors in the food system. The dynamics of transition processes are difficult to predict, but it seems that the movement towards a transition to a more sustainable food system in the rural district of Augsburg has been accelerated by the recent disruptive shock of the Covid-19 pandemic.

Keywords: food system, sustainability, transition, local, Landkreis Augsburg, Multi-Level Perspective

Word count: 11,981

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1 Introduction

Food systems are complex webs, consisting of all activities and actors involved in feeding people. They cover every aspect related to the "production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries" (FAO, 2018, p. 1). Overall, they encompass all services, inputs, institutions and infrastructures that ensure the functioning of the above processes (IFAD, n.d.). Generally, the elements of food systems can be divided into four groups: producing food, processing and packaging food, distributing and retailing food, and consuming food - with the food supply chain consisting of the first three groups (Ericksen, 2008).

Understanding the workings of food systems is an important subject in sustainability science, as they have various environmental and social impacts. The current methods of production, processing, distribution and consumption in conventional-style global food systems are not only a major source of greenhouse gas emissions, but also contribute to the destruction of natural habitats (Duru & Le Bras, 2020). Furthermore, today's globalised food system is driven by only a few large, influential economic actors such as transnational corporations, leading to power inequalities, as producers and consumers experience a significant reduction in power (Dansero & Pettenati, 2015).

The focal point of this thesis will lie on the last two stages of the food system, as defined by Ericksen (2008): 'distributing and retailing food' and 'consuming food'. Literature dealing with these stages focuses mainly on the urban population as consumers, as can be seen in Dansero and Pettenati (2015) categorising the city as a "space of consumption" (p. 552) and rural areas as "spaces of production" (p. 552). This is representative of a long list of literature examples (see e.g. Miller, 2021; Levidow and Darrot, 2010; Yacamán Ochoa et al., 2019). The definitions in these examples imply that urban areas are less a space of production and more a space of consumption, which holds true due to the lack of suitable spaces for agricultural production. However, rural areas are not only spaces of production, but are also home to people, many of whom have no direct connection to food production processes (BMEL, 2020). These people also represent an important group of consumers, that should not be neglected when building a distribution and retail structure in a more sustainable food system.

Therefore, this thesis focuses on analysing food distribution and consumption in a rural area. More specifically, it aims to explore the dynamics of the food system in the case of the rural district of Augsburg (German official name: Landkreis Augsburg) with a focus on distribution, retail and consumption. The city of Augsburg received the German Sustainability Award in 2013 and implemented sustainability guidelines, while the rural district surrounding the city was not included in these achievements (Strambach & Pflitsch, 2016; Pflitsch & Strambach, 2018). Therefore, there is much

emphasis on sustainability initiatives in the urban context, but not so much for the rural district of Augsburg. This thesis will put the spotlight on dynamics within the food system of the rural district to investigate the current state of sustainable development by addressing the following research questions (RQs):

- **RQ1:** What are trending sustainable food initiatives in distribution and consumption in the rural district of Augsburg?
- **RQ2:** What are the challenges in food distribution and consumption?
- **RQ3:** How can the barriers toward a more sustainable food system be addressed?

In addressing these questions, I employ the Multi-Level Perspective (MLP) framework from transition studies (Geels, 2004) as defined in Chapter 3. This framework helps to explain entry points to shifts in socio-technological systems that are needed to restructure production and consumption patterns in a more sustainable way (Smith, 2007).

Next to the explanation of the MLP in Chapter 3, Chapter 2 will explain current problems as well as what is considered sustainable in the context of food systems. Chapter 4 will explain the methodology used for this study and give an introduction to the case, while Chapter 5 will present and analyse the collected data to answer the RQs. Ultimately, Chapter 6 and Chapter 7 will finish the thesis with some reflections and concluding remarks.

2 Background

Keeping the research questions in mind, the purpose of this chapter is to provide an overview of the problems inherent in the currently dominant food systems. Furthermore, this chapter will shed light on what factors are frequently addressed in the existing literature when it comes to achieving more sustainable food systems.

2.1 Current food systems

Problems related to current conventional food systems are manifold. The practices involved in the process flow of today's globalised food systems emit major amounts of greenhouse gases (Karner, 2010), through factors such as agricultural inputs, methane release from livestock, food transportation, energy requirements for storage and food waste (Soubry, 2021). Therefore, a change in everything related to food consumption is one of the cornerstones in the transition towards a more sustainable society (O'Neill et al., 2021). Another reason to work toward a change in the food system is that with the increasing prevalence of disruptive events related to the climate crisis as well as other shocks such as geopolitical commotions or pandemics, "supply chain turbulence and disruption has become the new normal" (Blessley & Mudambi, 2022, p. 71). The resilience of supply chains as we know them in the conventional globalised system is questionable as they are not equipped to cope with extreme events and their impacts (Fuchs et al., 2021). This results in the disruption of trade, distribution and retail as seen in the case of the Covid-19 pandemic (Weerabahu et al., 2021). The cause for this being the dynamics of the current system, where the global food market is dominated by only a few, but very powerful, major agri-food corporations who are engaging in the commercial agricultural production of food (Karner, 2010). Thus, there is a disconnect between the production and consumption of food leading to disjointed stages of the food chain (Dansero & Pettenati, 2015; Todorovic et al., 2018). As a result, rural areas, although crucial as production spaces, are devalued as they are seen as merely supporting industrial agriculture (Dansero & Pettenati, 2015). Farmers miss out on the added value, which is instead concentrated in processing sites for raw materials (Levidow & Darrot, 2010). In this unbalanced globalised food system, the relationship between food and its place of production is destroyed, leading people to eat standardised, homogenous food that comes from a non-place-based value chain (Dansero & Pettenati, 2015).

2.2 Making food systems sustainable

Literature dealing with how to tackle these food system issues of negative environmental impacts, power inequalities and supply chain instabilities with the aim of transitioning to a more sustainable food system focuses mainly on the aspects of short food supply chains, local food systems and organic food production.

Short food supply chains originally developed as a means of farmers' resistance against the development of global retail chains (Todorovic et al., 2018). The aim of these shortened supply chains is to reconnect producers and consumers by reducing the amount of intermediaries involved, while also allowing the producers to receive a larger share of their products' market value (Karner, 2010). In the field of business economy, short food supply chains are defined by consisting of a maximum of one intermediary (Yacamán Ochoa et al., 2019). However, the concept does not necessarily imply anything about local proximity, meaning that products could also be transported long distances to reach consumers (Todorovic et al., 2018).

This is where the combination with local food systems comes into play. Local proximity between producers and consumers reduces transports and energy use (Lange & Heller, 2019). Additionally, local food systems also put emphasis on limiting the number of intermediaries and promoting rural development by pursuing the redistribution of value in the food supply chain (Bloom & Hinrichs, 2011). Overall, the focus of local food systems lies on social cooperation and economic development (Karner, 2010; Dansero & Pettenati, 2015).

However, the locality criterion alone does not guarantee that the food being sold and consumed is sustainable (Schönhart et al., 2009; Bourges, 2020), as the conventional food production still has a high environmental impact, through factors such as nutrient runoff, greenhouse gas emissions, biodiversity loss or soil degradation (Wang et al., 2017). A switch to organic food production does not only abstain from these negative impacts on the environment, but also improves the food quality and health, due to less pesticide residues and heavy metal contamination compared to conventional produce (Hansmann et al., 2020).

All these aspects of a transition towards more sustainable food systems are condensed in the concept of alternative food networks. Besides locality criteria and short supply chain structures (O'Neill et al., 2021), small farm sizes, alternative food purchasing venues and committing to economic, social and environmental aspects of sustainable food production, distribution and consumption are defining criteria for alternative food networks (Dansero & Pettenati, 2015). Organisation forms include open air markets, annual food events, farm shops, cooperative shops, box schemes, community supported agriculture and public procurement of local food (Karner, 2010). An interesting aspect that has been

observed is that the purchase of food via these networks is associated with an increased aversion against wasting these foods, leading to less food waste (O'Neill et al., 2021).

So far, a sustainable shift of the conventional food system in the all-encompassing direction of short supply chains, localisation and organic food production is prevented by factors such as the power concentration in large-scale organisations, that lock the globalised industrial food system in place (Hvitsand et al., 2022). While research has been made on the development of the organic sector (e.g. Smith, 2007; Limnios et al., 2016; Hansmann et al., 2020) and of the re-localisation of food production (e.g. Dansero & Pettenati, 2015; Levidow & Darrot, 2010; Karner, 2010), there is not much scholarly data on the implementation of accessible distribution channels that focus on both local and organic food (Pardillo Baez et al., 2020). That is why this thesis will study the issue in the specific spatial context of the rural district of Augsburg.

3 Analytical framework

In order to analyse the specific situation of the food system in the rural district of Augsburg, the Multi-Level Perspective framework is applied. The following chapter will provide a brief introduction to the different levels of the framework as well as what the framework means for a transition of the food system.

3.1 The Multi-Level Perspective (MLP) from transition studies

This thesis uses the Multi-Level Perspective (MLP) from transition studies after Geels (2004) as a framework to analyse the development of innovations. The framework enhances previous approaches used to study innovations and systems in which they occur, by including not only the production side of the system but also the demand/user side (Geels, 2004).

The MLP after Geels consists of three different levels that help analyse the opportunities and hindrances in the development of innovations (Figure 1).

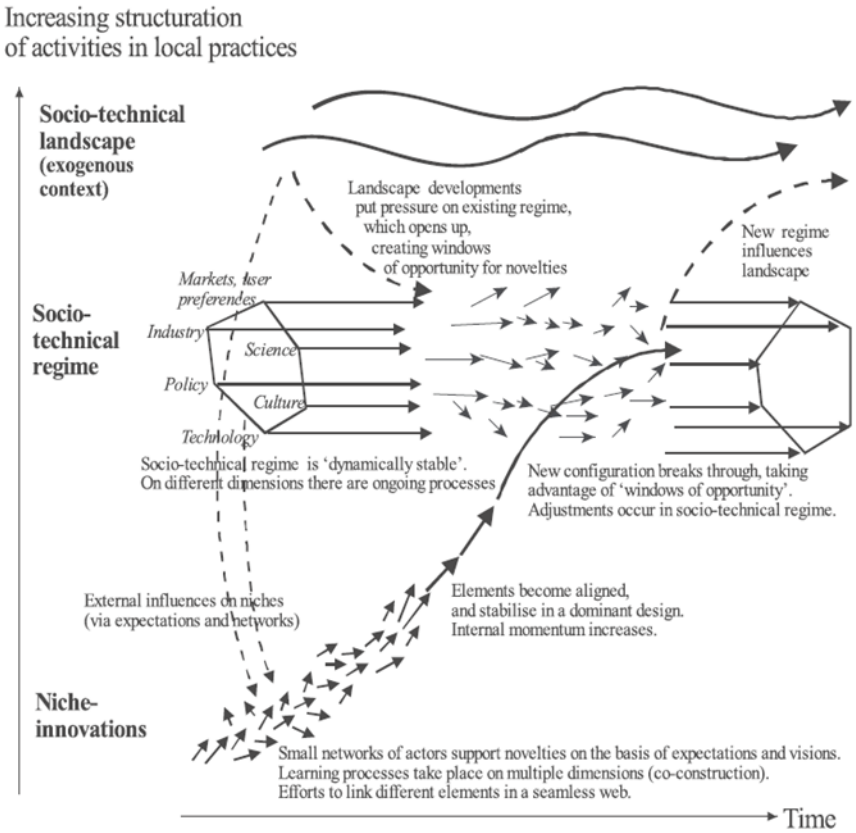

Figure 1. Multi-Level Perspective on transitions (Geels & Schot, 2007, p. 401). The figure shows the different levels of the MLP, namely niche innovations, the socio-technical regime and the socio-technical landscape, and the dynamic interactions between levels.

The first level is where niche innovations are developed by dedicated actors, who are often new entrants or relative outsiders (Geels & Schot, 2007). Niche actors hope that the innovations can be

integrated into the existing system or replace it in the future, as the niche innovations are developed to tackle problems in the existing regime in the first place (Geels, 2004). Niches are crucial as spaces for radical innovation, because they offer a protected space that separates them from the mainstream market selection. This protection is often provided by public authorities, subsidies or strategic investments within firms (Geels, 2004), which allows the innovations to grow until, if successful, they have the opportunity to challenge the existing system and attract mainstream interest (Smith, 2007).

The second level of the MLP is constituted by the socio-technical regime, which is comprised of aligning rules of different regimes such as the user and market regime, the socio-cultural regime, the policy regime, the science regime and the technological regime (Figure 2).

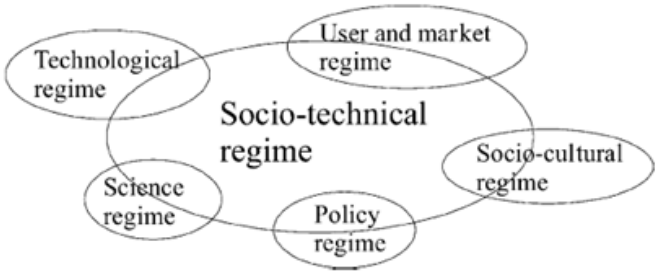

Figure 2. Meta-coordination through socio-technical regimes (Geels, 2004, p. 905). The figure shows how the aligning parts of the technological regime, science regime, policy regime, socio-cultural regime and user and market regime constitute the socio-technical regime.

These regimes are defined as different social groups consisting of actors who share common values and goals and belong to the same associations or social circles (Geels, 2004). The diverse regimes share some rules with each other, and these aligning rules not only constitute the socio-technical system but also keep it institutionally, economically, organisationally and culturally stable (Geels, 2004). They can be divided into three different categories: regulative, normative and cognitive rules (Scott, 1995, as cited in Geels, 2004). The regulative dimension includes formal rules constraining behaviour and regulating interactions. The normative dimension refers to duties, rights, role expectations, values and norms, while the cognitive dimension represents the frame we use to capture meaning or sense and the nature of reality (Scott, 1995 as cited in Geels, 2004). For a better understanding of the distinction between regulative, normative and cognitive rules with examples from the different regimes, see Appendix D. When tensions and mismatches arise between rules constituting the socio-technical regime, this can be the foundation for a transition of the system (Geels, 2004).

The last level of the MLP, the socio-technical landscape, represents the exogenous context in which niche innovations and socio-technical regimes and the interactions between their actors are situated (Geels, 2004). According to Geels (2020b), this is the level at which slowly changing secular trends in society and at the global level (such as demographics, macroeconomics, ideology, climate change) are

articulated. The landscape with its heterogeneous factors is more difficult to change than regimes (Geels, 2002). When change does occur, it happens more slowly than regime change and cannot be directly influenced or changed at will by actors because material environments or shared cultural beliefs/values are difficult to change (Geels, 2002). However, disruptions such as wars, recessions or an oil shock can have a direct impact on the socio-technical landscape (Geels, 2020b).

3.2 Towards a transition in food distribution and consumption

Having explained the different levels of the MLP, this subchapter aims to illustrate how transition processes in systems such as the food system can be examined with the help of the MLP.

Research on the transition to sustainability has found that existing socio-technical regimes need to be radically redesigned in order for society to have the opportunity to develop in a more sustainable direction (Strambach & Pflitsch, 2016). When socio-technical regimes are stable, it is difficult for niche innovations to break through, but when tensions and mismatches arise, they create a window of opportunity (Geels, 2004). There are several reasons for such tensions to occur: changes at the landscape level put pressure on regimes, negative externalities (e.g. environmental impacts) put pressure on regimes, a change in user preferences arises, or companies from the existing regime sponsor a niche (Geels, 2004). To illustrate different ways in which change can happen after the emergence of tensions, Geels et al. (2016) distinguish four transition pathways in the MLP, based on earlier findings by Geels and Schot (2007): substitution, transformation, reconfiguration, and de-alignment and re-alignment. Substitution means that in case of disruptive change at the landscape level, sufficiently developed niche innovations replace the existing regime. Transformation implies that moderate pressure from the landscape leads to a reorientation of the regime actors because the niches are not sufficiently developed. Reconfiguration means that niche innovations and the existing regime together alter the architecture of the system. Finally, de-alignment and re-alignment is when a large and sudden change causes the regime to de-align and several niche innovations co-exist until a dominant niche innovation re-aligns the new regime. The pathways are not mutually exclusive, and a transition can shift from one pathway to another (Geels et al., 2016).

In this thesis, I use the MLP to explore the barriers that prevent current sustainable food initiatives from scaling up. The current socio-technical regime in the food system can be defined to be structured "around large quantities of processed, packaged food available all year provided domestically and by imports" (Smith, 2007, p. 442), while influencing factors from the socio-technical landscape include trends such as globalisation and digitalisation. In the thesis, these elements of the system and their interactions provide the foundations for identifying potential entry points for transition pathways towards a more sustainable food system.

4 Methodology

Having established the analytical framework that will be used for the purpose of the study, this chapter will explain the choice of a case study design for this thesis and will give a brief introduction to the case of the rural district of Augsburg. Furthermore, the process of data collection and analysis will be elaborated. The chapter will close with a brief section on ethical considerations in the context of this research.

4.1 Research design

For researching barriers and opportunities on the way towards a more sustainable food system in the rural district of Augsburg, a case study design was chosen, as it allows for exploring a specific case and all related surrounding factors in great detail (Bryman, 2012; Flyvbjerg, 2006).

Conventional bias against the single case study research design reduces the approach to not being helpful for scientific development as it believes that it is not possible to generalise the data gained from single cases (Flyvbjerg, 2006). Thus, research designs including larger samples based on multiple cases are believed to produce more compelling results (Flyvbjerg, 2006). However, Flyvbjerg (2006) objects to this claim by stating that the context-dependent knowledge gained from the close proximity between the case study and the real-life situation can be of particular importance for research. Data gained from a single case study can be used for theoretical analysis as an exemplifying case, the insights of which may later be applied to other cases from a broader category which the analysed case is a part of (Bryman, 2012).

4.1.1 The rural district of Augsburg

In this thesis, the setting for the case study is the rural district of Augsburg. It is located in the southern German federate state of Bavaria, in the administrative district of Swabia, and comprises a total of 46 municipalities (Landkreis Augsburg, n.d.). The rural district is located south, west and north of the city of Augsburg (see Appendix B). With a total population of 257,700 in 2021, the number of inhabitants has been on a constant rise in recent years (STAZ, 2022). Even though the total mortality was higher than the birth rate in 2021, the total number of inhabitants still increased due to a high rate of in-migration (STAZ, 2022). This shows an increasing popularity of the rural district as a place to live, which is in line with a general trend in Germany that has emerged in recent years due to rising costs of living and a declining quality of life in cities (BMEL, 2020).

The rural district of Augsburg was chosen as the local setting of the case study, as the area can be defined as an exemplifying case, because it “epitomize[s] a broader category of cases” (Bryman, 2012, p. 70). Starting right at the border of the city of Augsburg, which is known as a test city in market

research, because the citizens show typical consumption habits for Germany (David & Hilpert, 2016), it is assumed that that may also be the case for the population of the rural district of Augsburg.

In terms of the current state of the food system in the rural district of Augsburg, the share of organic agricultural holdings accounted for 6.7 % of all agricultural holdings in the Augsburg region in 2021 (AELF Augsburg, 2021). Small stores in rural communities face strong competition from larger retail chains. Between 2005 and 2014, more than one-third of small grocery stores in Bavarian Swabia had to close (Hilpert et al., 2019). More and more large corporations are displacing small local craft businesses such as bakeries or butchers (Lange & Heller, 2019). At the same time, the number of large discounters has increased by 10 % (Hilpert et al., 2019). Consumers are becoming more hybrid and are looking for spaces that can satisfy their different shopping needs, by offering a range of different shopping experiences in one cluster. In this way, neighbourhood centres and small towns are at risk of becoming unattractive to consumers because of limited variety in grocery shopping (David & Hilpert, 2016).

4.2 Data collection and analysis

To answer the research questions in the context of the rural district of Augsburg, a mixed methods approach was adopted, combining qualitative data with quantitative data, which is common in case studies (Bryman, 2012). The approach allows for finding a more complete answer to the research questions, as gaps left by one method of data collection can be filled in with data gained from the other method of data collection (Bryman, 2012).

For the primary data collection, semi-structured expert interviews and a survey were conducted. Additionally, a literature review was undertaken. The data was collected in an iterative process, therefore the research was guided and refined throughout the process based on preliminary findings that emerged during the simultaneously ongoing analysis (Bryman, 2012).

4.2.1 Literature review

The literature review was undertaken prior to the data collection through the interviews and the survey. The aim was to gain an understanding of what is defined as sustainable in the context of local food systems, particularly in the field of food distribution. This was done to build up background knowledge for writing Chapter 2 and to be able to use the outcomes for the analysis and discussion of the results from the interviews and the survey. A list of articles was reviewed that resulted from a search in the scientific database Scopus. The search string used was ("food distribut*" AND "sustain*" AND "local*"). After limiting the search results to texts written in English, 61 papers were included for initial screening. References listed in the articles deemed most relevant were also taken into account

in later stages of the literature review. This process continued throughout the period of data collection through the interviews and the survey to enhance my understanding of issues coming up in the collected data.

4.2.2 Semi-structured expert interviews

Semi-structured interviews were conducted to collect data on current sustainable initiatives in the food distribution and consumption in the rural district of Augsburg, and the barriers and potential chances for further development. This type of interview allows the order of the interview questions to be changed during the conversation, while at the same time allowing for further questions emerging from relevant responses to be asked (Bryman, 2012).

Due to the ongoing Covid-19 pandemic with high case numbers in the region during the data collection period, the interviews were conducted via the video platform Zoom. All interviews were carried out in German.

For a holistic understanding of the topics, seven expert interviews were conducted with representatives of development programmes, shopkeepers and farmers involved in direct marketing. A list of all interviewees and their functions can be found in Table 1. The interviewees were chosen either because they were deemed relevant by myself or because they were suggested by other interviewees, following the snowball sampling approach (Bryman, 2012).

Table 1. List of interviewees

No.	Reference code[1]	Responsibility / function	Date
1	FA01/ FA02	Two farmers at an organic farm in the rural district of Augsburg; Part of Community Supported Agriculture Augsburg ('Solidarische Landwirtschaft Augsburg')	2022-03-21
2	DP01	Representative of a development programme supported by the Office for Rural Development Swabia, promoting greater recognition of organic farming and its contribution to sustainable regional development	2022-03-25
3	DP02	Representative of a regional development association related to the LEADER programme, based in the southern part of the rural district	2022-03-28
4	DP03	Representative of a regional development association related to the LEADER programme, based in the western and northern part of the rural district	2022-03-31
5	FA03	Farmer at an organic farm in the rural district of Augsburg; Part of a programme funded by the Bavarian State Ministry of Nutrition, Agriculture and Forestry that promotes an appreciation of food and an understanding of the environment and nature among schoolchildren	2022-04-05
6	SH01	Representative of an organic-local grocery shop in the rural district of Augsburg; Representative of an initiative of the Bavarian Administration for Rural Development that supports local entrepreneurs	2022-04-11
7	DP04	Representative of an initiative promoting organic farming and processing and the demand for organic food in the Augsburg region	2022-04-26

The pre-formulated interview questions were slightly adapted for each interviewee, but each interview started with questions specifically related to the interviewee's position and activities in the food system and ended with more broad questions on the general assessment of the situation and problems in the rural district of Augsburg. An example of an interview guide can be found in Appendix A.

The data was collected in accordance with the guidelines for ethical research from the Swedish Research Council (2017). At initial contact and shortly before the interview, all respondents were informed about the aim of the research as well as their role in the study. The interviewees signed a consent form prior to the interview, in which they were guaranteed anonymity and were informed about their right to terminate their participation in the research at any time. All participants were part of the research on a voluntary basis.

For the analysis of the data, the interviews were recorded with the consent of the interviewees and then transcribed. All direct quotations have been translated by me, which is why I take full

[1] The first two letters of the reference code define the group which the interviewee belongs to, while the number indicates the order in which the interviews were conducted. The different groups are: DP = Development programmes, FA = Farmers, SH = Shops.

responsibility for any inaccuracies. When checking the transcribed text for accuracy, filler words and repeated words were excluded, as the aim was not to portray emotions, but to analyse the factual content given (Kvale, 2007). Following this process, a content analysis of the qualitative data included in the transcripts was conducted, following the guidelines for theoretical thematic analysis by Braun and Clarke (2006). Thematic analysis is a method to work with data in order to identify, analyse and report patterns, also called themes. According to Braun and Clarke (2006), the analysis can be split in six phases: getting familiarised with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report. In working through these phases, the thematic analysis can be either inductive or theoretical. The inductive approach suggests that identified themes are closely linked to the data, without trying to fit them into a pre-existing theoretical frame, while the theoretical approach implies that themes are identified with a specific analytic framework or pre-existing research questions in mind (Braun & Clarke, 2006). For the qualitative interview analysis carried out for this thesis, the theoretical approach of thematic analysis was chosen. Digital helper in this process was the data analysis software NVivo 12 Plus.

4.2.3 Survey

In addition to the expert interviews, a survey was conducted to investigate the consumer preferences and practices first-hand. The survey included a total of 19 open and closed questions and 11 Likert scales, the list of which can be found in Appendix E, and was aimed at all citizens living in the city of Augsburg and the rural district of Augsburg. The survey was conducted using Google Forms.

The response period was approximately 2.5 weeks (25 March 2022 - 12 April 2022) and 121 responses were received.

Open questions were later coded to identify overarching themes and to transform the qualitative data into quantitative data. After coding, descriptive statistical analysis was carried out, to compare the data of the different groups and the frequency of the different elements.

Although aiming to include a diverse group of respondents, the representativeness of the survey turned out to be limited. First, among the respondents, people who identified as female accounted for 73 %, while people who identified as male accounted for only 27 %, leading to a gender bias in the results. The overrepresentation of females is a phenomenon that is often observed in the participation in questionnaires (Voitsidis et al., 2021). Secondly, since dissemination of the survey via Facebook groups was not very successful, personal networks helped to spread the word. Judging from the final results of the survey, this might have led to a bias in the data, as the survey reached many people from the group of consumers who are already concerned with a more sustainable way of consumption. Third, almost half of the respondents (48 %) are in the 40-59 age group, which means that other groups

are underrepresented in the results. A higher representation of a more diverse group would improve the accuracy of the study.

Even though people from both the city and the rural district were included in the survey, it was later decided to focus the analysis on respondents living in the rural district, so most of the results of the analysis are based on only 55 % of the respondents.

4.3 Ethical consideration

Being born and raised as a citizen of the city of Augsburg, I need to point out my standing. I also have many connections to the rural district of Augsburg through relatives, friends and the location of my high school. Therefore, I cannot call myself a neutral observer. My initial choice of interview partners might have been influenced by connections through my personal network, but by asking them for suggestions for other interview partners, I did my best to overcome my biases.

5 Results and analysis

Using the analytical framework of the MLP, the investigation of RQ1 is mainly informed by the level of niche innovations and the current socio-technical regime, while the analysis of RQ2 is mainly based on the socio-technical regime. The analysis of RQ3 tackles all three levels of the MLP.

5.1 RQ1: What are trending sustainable food initiatives in distribution and consumption in the rural district of Augsburg?

In this subchapter, the current situation of sustainable initiatives striving for a more sustainable food system in the rural district of Augsburg is portrayed.

5.1.1 Existing sustainable food initiatives

As a means of counteracting the current dominance of the large grocery shops, alternative food networks have developed as niche innovations. Karner (2010) gives a list of types of organisations that belong to alternative food networks, many of which can also be found in the rural district of Augsburg. A large part of these organisation types consists of direct sales from the producer to the consumer. In the rural district of Augsburg, there are a few farmers' markets offering local products (both conventional and organic), with some just having started (DP03). There are also annual events whose main purpose is to market local and sustainable producers. Lighthouse examples include an organised bicycle tour visiting different farms and a local producers' fair (DP03). Furthermore, there are a growing number of farm shops selling their local organic products (DP01, FA02, FA03). Another flagship example of sustainable food sales are cooperative shops that offer a wide range of products (Karner, 2010). A number of such shops have recently opened in the rural district of Augsburg (FA02, DP01, DP02, DP03, FA03, SH01). An additional form of organisation that can be found in the rural district of Augsburg is Community Supported Agriculture (CSA). However, the consumers supporting the local CSA are mainly located in the city and not in the rural district (SOLAWI Augsburg, n.d.; FA02). Another project that has been initiated is public procurement to get more institutions to source their food locally (DP01; DP04). The final form of alternative organisation that can be found in the rural district of Augsburg, and is listed by Karner (2010), is box schemes that offer customers a regular supply of organically produced local and seasonal food (e.g. Die rollende Gemüsekiste, n.d.).

A further possibility mentioned by Karner (2010) to strengthen local food systems is the introduction of a regional brand, which has also been implemented in the rural district of Augsburg in different variants (DP02; UNSER LAND, n.d.). Additionally, efforts have been made to create fully local, sustainable supply chains by connecting producers, resulting in supply groups that aim to ensure the

long-term supply of raw materials to a processor, or creating a local product using only locally and organically sourced raw materials (DP01; DP03; DP04).

5.1.2 Support for sustainable food initiatives

There are various programmes which some of these listed niche innovations can benefit from, to grow big in a protected space, and a few of them will be listed in the following. Examples include rural development projects from which local provision concepts can be funded in the context of village renewal (Hilpert et al., 2020). Another funding programme is the Rural Development Programme for Bavaria, which is supported by the second pillar of the EU's Common Agricultural Policy (European Commission, n.d.). The programme provides funding for Local Development Strategies under the LEADER approach (Liaison Entre Actions pour le Développement de L'Economie Rurale), which emphasises the importance of local communities in decision-making about their local rural development (BMEL, 2020; DP01; DP02; DP03). Another programme initiated by the Bavarian State Ministry of Nutrition, Agriculture and Forestry, which is also very active in the Augsburg region, is the Öko-Modellregion Stadt.Land.Augsburg, which aims to promote organic farming through awareness raising, networking, consultancy and, more recently, funding (DP01; DP02; DP03; DP04; FA03).

5.1.3 Supply situation

Despite all these support programmes, the innovations remain in their limited sphere of influence. While organic food, which used to be more of a niche issue, has managed to be incorporated into the current conventional food system based on large quantities of processed foods available year-round (Smith, 2007), this is not yet the case for products that combine organic with local attributes. Therefore, there are not enough locations in the rural district of Augsburg that offer sustainable local provision that are accessible and feasible for all (FA01; DP01; DP03; SH01). However, the situation strongly depends on the types of food in question. While the supply conditions for food products such as potatoes (DP01) or eggs (FA02) are quite good, the rural district of Augsburg lacks local organic meat producers and butchers (DP01; DP02). Also, interviewee FA01 argues that even if there are producers who sell their products directly from the farm, this is often too inconvenient for consumers as they have to drive from farm to farm for their weekly shopping because the farms only offer a very limited range of products. Furthermore, there are differences depending on where the consumers are located in the rural district of Augsburg (DP01). While there is a good supply situation in the southern part of the district (DP02), there are areas in the other part that do not have any local provision in their vicinity (DP03). This fact about the disparity between different parts of the rural district might offer an explanation as to why in the results of the survey 16 % of the respondents living in the rural district of Augsburg stated that they do not have enough shops for self-supply in their immediate surroundings

(Figure 3). The results also show that although 76 % of the respondents consider there to be sufficient shops to supply themselves in their immediate vicinity, only 60 % think that there are enough shops selling local organic food. As can be seen in Figure 3, the numbers for people being under the impression that there are enough shops selling local foods and enough shops selling organic foods are slightly higher than for shops selling foods combining the two attributes.

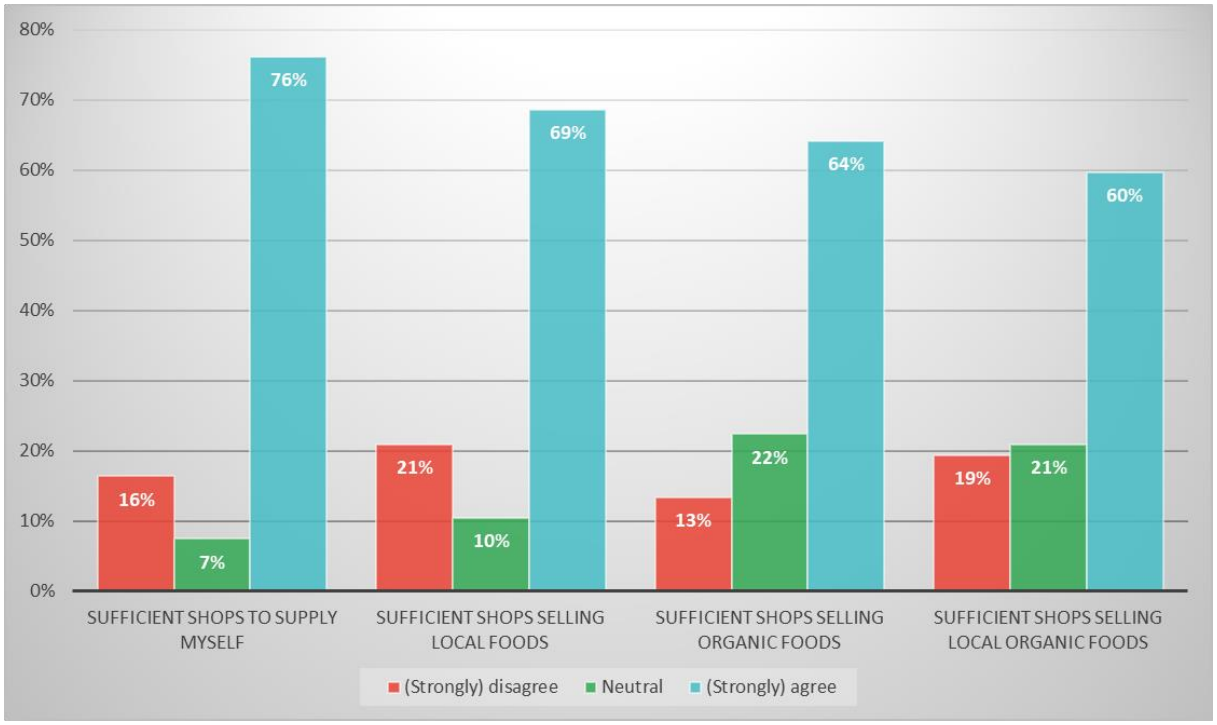

Figure 3. Supply situation in the rural district of Augsburg (own creation based on survey results). The diagram shows how the respondents living in the rural district of Augsburg perceive the supply situation in their immediate surroundings. The four questions the answers to which are shown in the diagram relate to whether there are enough shops to supply oneself, whether there are enough shops selling local food, whether there are enough shops selling organic food and finally whether there are enough shops selling local organic food. The answers were grouped into three categories: "strongly disagree" and "disagree" were merged into "(strongly) disagree", the same way as "strongly agree" and "agree" were merged into "(strongly) agree". The third category is being neutral about the claims made. The frequency of the answers is shown as a percentage of the total group of respondents living in the rural district of Augsburg.

5.2 RQ2: What are the challenges in food distribution and consumption?

This subchapter will look into the question of why the niche innovations from the rural district of Augsburg mentioned above remain in their limited sphere of influence and have not yet managed to become mainstream. For this purpose, challenges and barriers in the distribution and consumption of sustainable foods are investigated.

5.2.1 Challenges related to infrastructure and regulations

One challenge that often arises with initiatives emerging in the context of short food supply chains is that they have limited impact due to inefficiencies that prevent them from scaling up (Yacamán Ochoa et al., 2019). A major problem they face is logistics/distribution, low sales volumes and therefore high transport costs (Yacamán Ochoa et al., 2019).

Other problems they face are regulatory in nature and are set by the policy regime. Strict hygiene and safety regulations imposed by the EU, for example, and the costs associated with implementing them, account for a higher proportion of a small producer's revenue compared to a large company (Karner, 2010; FA03). Interviewee DP02 put it this way:

> The EU has a tendency to set consumer protection at a very high level, which is in principle not a bad thing. But in 2009, for example, when the regulations for slaughtering and butchering were set so high, that even as a small butcher's shop I need a disinfection line I have to go through, I have to tile my walls wall-high everywhere. And for many butchers that was an extremely high cost. And the EU requirements do not differentiate between a large enterprise and a micro-enterprise. And for micro-enterprises, it makes much more of a difference in terms of turnover than for a large company. As a result, many butchers have stopped working here since then, or there was no succession, because they simply said that from a cost-benefit point of view, this is no longer interesting for us. (DP02, p. 13)[2]

Lack of material and organisational structures also makes it difficult for small initiatives/businesses to keep up with the global conventional food supply chain at a reasonable cost (Yacamán Ochoa et al., 2019; DP04). Or as interviewee FA03 put it:

> Regional processing options are a huge topic. So we have harvested spelt now, last year already. And just these things alone, where do I husk it, where do I mill it? I'm driving around in zigzags, it costs a lot of money, so we've already said that it's not worth it. Because for what

[2] The original quotes from the interviews conducted in German were translated to English for consistency. A list of all original quotes can be found in Appendix C.

> I need to get the thing into the bag in the first place, it is already ready lying on the shelf at Lidl [international chain of discounters]. (FA03, p. 10)

Another factor that these small-scale producers struggle with is the time they have to spend to understand and fill out the paperwork for funding that they may be eligible for (Levidow & Darrot, 2010). According to interviewees FA01 and DP01, bureaucratic hurdles often make it very difficult and almost impossible to gain a full understanding of the options available. FA01 also pointed out that it is much easier for larger companies to ensure that they do not overlook any option or violate the law, as they have the capacity to employ staff only for these specific tasks, whereas small initiatives are usually managed by very few people. Moreover, interviewee SH01 stated that there are no support programmes providing financial funding specifically related to sustainability for anything that happens off-farm - such as farm-independent shops (see also DP01).

Furthermore, local food systems are not visible at the level of EU and national policies (Karner, 2010). Interviewee DP04 picked up on the same aspect: "local provision, food security, should be on every country's political agenda. This was not the case at all in the last decades" (DP04, p. 7). However, this is not the only obstacle that niche innovations face from the policy regime. Procurement contracts with public agencies, which could play a crucial role in promoting sustainable food suppliers, used to stipulate that the lowest-price option had to be chosen. Although this has since been broadened, most public authorities still adhere to the lowest price criterion (Karner, 2010).

5.2.2 Challenges related to consumer preferences and practices

In addition to problems related to infrastructure or regulations, niche innovations also have to deal with the user and market regime (Yacamán Ochoa et al., 2019), which is also part of the socio-technical regime as was shown in Chapter 3.1. The setup of the regime includes defined user practices and preferences, which have major impacts on the acceptance of new innovations. The current lack of awareness about sustainability related factors, among users of the food system in the rural district of Augsburg, causes sustainable innovations to miss out on customers, which is why a lack of awareness-raising activities can be identified as a barrier to the success of these innovations (DP01; DP03; FA03; DP04). SH01 also pointed out that awareness raising and education are not only crucial to reach individual customers, but also to achieve policy change as politicians are: "people who have not learned this themselves. Politicians are only human, too, and they sit in their decision-making positions with the knowledge they have absorbed and the experience they have gained in their lives" (SH01, p. 4).

Another issue is that the local scale is often seen "as panacea of the negative aspects of the food system" (Dansero & Pettenati, 2015, p. 563), meaning that the local is overvalued in that it is presented

as the ultimate solution. Consumers perceive that buying local produce has social, economic, environmental and health benefits for themselves and for producers, and therefore they place a higher demand on local rather than on organic produce - especially in rural areas (Bloom & Hinrichs, 2011). This was also observed in the rural district of Augsburg by interviewees FA02, DP01, DP02 and SH01. Interviewees SH01, DP03 and DP04 all stressed that local is not synonymous with sustainable and that there is a need for greater awareness-raising amongst consumers about the benefits of local organic products. However, interviewee DP02 stated that marketing regional attributes has more potential to attract potential customers, while emphasising organic attributes tends to drive them away, especially the more conservative, rural population. A survey conducted in a municipality in the rural district of Augsburg also found that 90 % of respondents are mindful of buying local products, while only 55 % stated that they consciously buy organic products (Hof, 2019: gained access via personal communication, March 3, 2022). However, the survey conducted for this paper found (Figure 4) that the majority (42 %) of respondents from the rural district of Augsburg indicated organic as the most important product characteristic when buying food, followed only in second place by local (28 %).

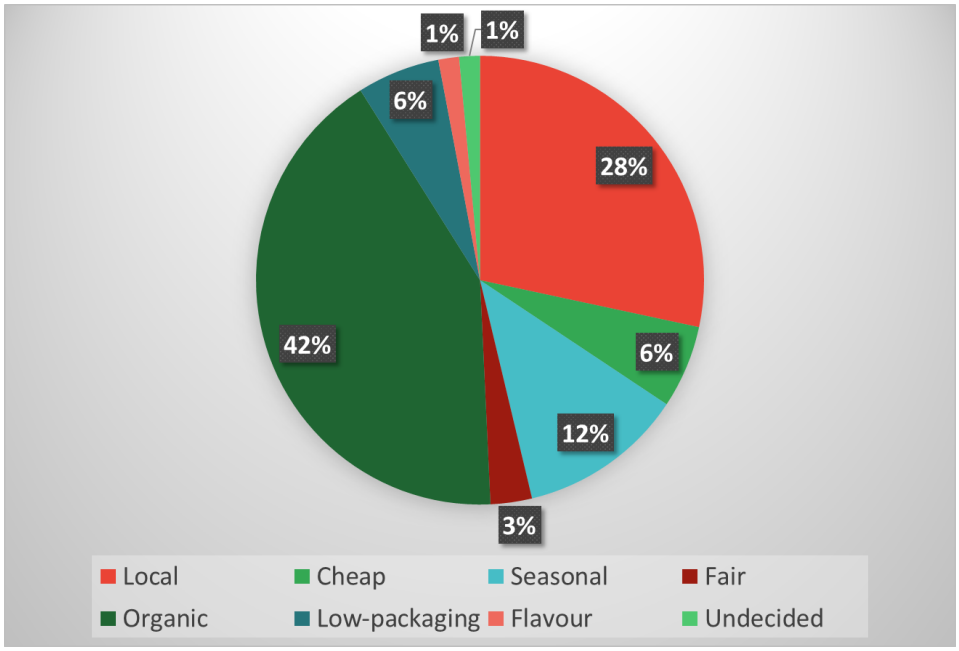

Figure 4. Top priority product characteristic (own creation based on survey results). The figure shows a pie chart depicting the most important product characteristics among the group of respondents living in the rural district of Augsburg. The numbers are given in percentages, in relation to the total number of survey respondents living in the rural district.

These results regarding the preference for the organic attribute contradict the observations of the respondents and the results of the preceding study. However, this can be explained by the fact that women generally have a more positive attitude towards organic food than men (Migliore et al., 2015) and the group of respondents was dominated by women. It could also be due to the very likely bias of

the group of respondents. This would indeed make sense, as the market share of organic products in Germany was still quite low at 6.4 % in 2020 (Hanke, 2021).

Also linked to user preferences in the user and market regime is the topic of price sensitivity. One of the main barriers for German customers to buy organic products is the higher price, as they are generally very price sensitive (Hanke, 2021). This Germany-wide trend was also addressed in many interviews as part of the customer base in the rural district of Augsburg (FA01; FA02; DP02; DP03; SH01; DP04). In the case of local organic products, this effect is amplified as lower costs are expected due to the shorter shipping distance compared to imported products (Bloom & Hinrichs, 2011). This misconception and lack of knowledge was also noted by interviewee SH01 among their customers:

> Many people are not at all aware of the linkages in this whole globally connected food or product sector. That labour costs still count for the most part, and that the production process itself is not always as regulated and as high as it is here, if it is a Bioland [organic certification standard] farm. (. . .) Organic from Peru is a completely different story in terms of production. This is precisely where there is simply a lack of background knowledge. (SH01, p. 2)

Additionally, buying organic food is still perceived by many as belonging to a certain social milieu (Hanke, 2021). Interviewees DP02 and DP03 confirmed that this is also the case in the rural district of Augsburg, which then poses the barrier of prejudice and lack of identification for the niche innovations. Yet even if customers are confident of the benefits of these sustainable innovations/alternative food networks, it does not mean that they will change their practices. Although they want access to these initiatives, they may not use them (Lange & Heller, 2019; FA01; DP02; DP03) because they find it difficult to break away from routines (O'Neill et al., 2021). Such routines are reinforced by habits that are found to often overpower newly gained knowledge and intentions to act as they are deeply ingrained in a person's way of living, shaping the person's behaviour without leaving much space for reconsideration (Linder et al., 2022). The survey carried out for this thesis found that 64 % of all respondents stated that their purchasing decisions are shaped by habits and only 18 % stated that this is not the case, which shows that dealing with ingrained habits and routines is also a very relevant challenge for niche innovations in the rural district of Augsburg. 43 % of the respondents from the rural district of Augsburg also stated that their main grocery shop is the supermarket or discounter, while 37 % stated that it is small independent shops. Again, however, this could be a bias in the survey, as it was explained in Chapter 5.1 that the number of small shops is decreasing.

Having identified these challenges in terms of logistics/infrastructure, regulations and customer preferences in the socio-technical regime, the following subchapter elaborates on how these barriers can be addressed. For that, potential opportunities on all three levels of the MLP will be explored.

5.3 RQ3: How can the barriers toward a more sustainable food system be addressed?

5.3.1 Opportunities at the niche level

At the niche level, the creation of networks can foster an environment of working together to become a stable alternative to the mainstream. Especially in the initial phase, actors who can establish connections between different institutional fields are crucial (Pflitsch & Strambach, 2018). In the field of local provision, collaboration is particularly important for initiatives to gain ground (BMEL, 2020; Hilpert et al., 2020). By sharing information and addressing problems together, participants in a local supply chain can achieve greater efficiency and adaptability, although this may often be challenging at first for actors who are more used to competitive relationships (Bloom & Hinrichs, 2011). However, the benefits of collaboration, and the associated bypassing of problems related to logistics or infrastructure by creating one of their own, can be well worth it. In addition, centralising the sales processes of local smallholders through collaboration can be a means of attracting more customer interest, due to greater variety and quantity (Yacamán Ochoa et al., 2019). But networks have many more benefits than just being practical. They create an environment of learning and provide support to the actors involved, helping to form a collective identity that makes the vision of broader societal change feel more feasible (Karner 2010). The benefits of networks were also echoed by the interviewees (FA02; DP01; DP02; FA03; SH01; DP04), with interviewees DP02, FA03, SH01 and DP04 stating that they definitely see a need for the creation of more networks between actors working towards a more sustainable food system in the rural district of Augsburg. FA03 described the situation as follows:

> I still feel a bit like a solo fighter. (. . .) I don't know at all who is around me. Well, sure, a few, but if they are a bit further away, I don't actually know (. . .) at all. So here I would like to see more interaction. (FA03, p. 6)

As these examples show, the creation of networks is needed and wished for to help unlock the full potential of sustainable food niche innovations in the rural district of Augsburg. Another idea to increase the niche innovations' potential within the short food supply chain and circumvent the problem of lack of infrastructure is to digitise their logistics processes to ensure efficiency (Todorovic et al., 2018). However, especially in rural areas, personal contact and relationships between producers and consumers can play a key role in the success of these innovations, so care should be taken to maintain them (Hilpert et al., 2020).

Local authorities can help the niche innovations gain momentum in their protected spaces in various ways. Firstly, they do have the best overview in order to be able to help with the logistics and efficiency of food distribution by linking the required resources (Mundler & Rumpus, 2012). Secondly, they can

support by giving the initiatives access to infrastructure such as shared facilities that comply with regulatory conditions (Levidow & Darrot, 2010; Karner, 2010), or by developing the technical infrastructure for processing and distribution (Bloom & Hinrichs, 2011; FA03; DP04). Such efforts could include the building of food hubs amongst other organisational forms (Yacamán Ochoa et al., 2019; DP03).

5.3.2 Opportunities at the regime level

At the regime level, a key driver of change for niche innovations to become more stable and enter the mainstream is the change in user preferences and thus practices which are anchored in the user and market regime. One opportunity that has led to changes in this area is that customers experience the good taste and high quality of sustainably (locally and organically) sourced products, which has already helped to convince some customers to change their consumption habits (FA01; DP02; FA03; DP04). In addition, support for local and organic products can be strengthened by making consumers aware of the negative impacts of the conventional food system through awareness-raising initiatives (Karner, 2010; Hansmann et al., 2020; DP01; FA03; SH01; DP04). Interviewee SH01 sees great potential in making sustainability more attractive by giving it the recognition it deserves in the media. This way, people would hear more about successful stories and initiatives and be more inclined to get involved as well (SH01). Furthermore, they see the need for an increase in: “Knowledge and education. Starting with the very young, but also adults. By that I really mean campaigns that do more than just have something printed in the newspaper that no one reads” (SH01; p. 10). Interviewees FA03, SH01 and DP04 also emphasised the need to implement educational activities on the topic already in kindergarten and primary school. Such educational content can help to tackle the price sensitivity of customers (Hanke, 2021). However, interviewee DP02 argued that most people are already aware of the impacts, but that the topic of environmental education is perceived negatively because consumers associate it with lifestyle restrictions. Another aspect that could contribute to changing user practices by talking less about restrictions, is raising consumers' awareness of their responsibilities in supporting local producers, reinforced by some kind of storytelling that allows consumers to meet their producers to learn more about them (Levidow & Darrot, 2010; FA01; FA02; FA03), and to get a better understanding of why higher prices are justified (Karner 2010; FA03; SH01). Focusing on the local helps customers identify with producers as part of their regional identity (DP01; DP02). However, even after achieving greater awareness and a sense of identification, the comparatively higher prices are still a major barrier for many people. Not everyone is able to pay the higher prices that come with the more sustainable production of local and organic products (SH01; D02). One possible way to address this problem is to implement measures to lower the prices of sustainable products (Hansmann et al., 2020). Yet, interviewee DP03 argued that not every sustainable producer would be pleased with this option,

as they would not appreciate their products being treated like discount products, since this would imply a kind of devaluation. Instead, the better way to address the problem of too high prices for some parts of society might be to support low-income consumers (Hansmann et al., 2020).

Apart from focusing on the individual consumer side of the food system, other actors from the existing socio-technical regime may also make changes to implement niche aspects. This is especially the case when the regime is put under sustainability pressure by policy to adapt green niche practices (Smith, 2007). An example of how this can be implemented is public procurement of sustainably grown food from local sources for school or other canteens to provide a stable source of income for niche innovations (Izumi et al., 2010; Yacamán Ochoa et al., 2019). Community catering in general provides a predictable and stable income for sustainable food initiatives originating from niches and thus offers a great opportunity for scaling up (Hanke, 2021; DP01; DP04). One factor preventing this from happening on a large scale is that there are not enough local processing facilities so far, as mass caterers often rely on food that is already processed (Bloom & Hinrichs, 2011), such as pre-peeled potatoes (Hanke, 2021). According to interviewee DP04, these problems are acknowledged in the rural district of Augsburg and they have started to be solved by linking relevant producers and processors.

Another part of the socio-technical regime having major influence on the fate of niche innovations is the policy regime. Similar to the city of Augsburg, policy makers in the rural district of Augsburg could commit to always follow sustainability guidelines when deciding on rural development projects (Strambach & Pflitsch, 2016). In consequence, regional economic cycles must be part of any future food and climate policy (Lange & Heller, 2019). Furthermore, governments need to pay attention to how regulations and trade laws affect small businesses in local food systems to ensure that they still have a chance to compete with large corporations (Karner, 2010). Equally important is the responsibility of local policymakers to consider the competitive situation when deciding where business parks should be located and who should be allowed to locate there (Lange & Heller, 2019). So far, this is not happening to a sufficient extent in the rural district of Augsburg (SH01; DP04). Interviewee SH01 explained that the problem lies in the German financing structure, because the municipalities are responsible for generating the money for their infrastructure such as schools, roads, and so on. Therefore, they have to build business parks and construction areas, as these are the biggest sources of revenue, often leaving sustainable practices out of the equation. To tackle this problem, a change in the general financing structure would therefore be necessary, for example at the German state level. However, interviewee DP03 also mentioned that the creation of new building areas could potentially have a positive impact on local provision, as they can increase demand in places where it was previously not worth opening a shop because there were not enough potential customers living there.

5.3.3 Opportunities at the landscape level

Moving on to the landscape level, the current structure of the globalised conventional food system is very centralised due to the way the long-term globalisation trend has played out. For the implementation of a more sustainable way of working in the food system, this approach of increasing globalisation would need to be replaced by a focus on decentralisation that puts power and leadership back into the hands of local producers and consumers (Yacamán Ochoa et al., 2019; FA01; SH01; DP04). Interviewee FA01 argued this way:

> In my view, there is no other choice in the medium run. (. . .) Because food is perishable. Food has to be consumed just-in-time (. . .). And it is simply not the predestined product to travel tens of thousands of kilometres. And that's why we (. . .) have to find our way back to regional structures, for completely pragmatic reasons. (FA01 & FA02; p. 2)

However, as discussed in Chapter 3, changes at the landscape level cannot be influenced by individual actors, as it reflects the long-term trends that exist in a society. Therefore, it is not possible to specifically target the landscape level.

Meanwhile, something that can influence the socio-technical landscape, as explained in Chapter 3, is disruptive shocks. The Covid-19 pandemic has led to a significant change in people's daily lives in the last two years. Life-altering events like these have the potential to disrupt people's deeply ingrained habits which can then lead to behaviour changes (Taibjee & Woodley, 2020) and therefore changes in consumer practices and preferences. With many people working from home, it became clear how important local provision is and what it means when it is missing (BMEL, 2020; DP03). In addition, people cooked more at home, as was revealed by a Germany-wide study in which 41 % of respondents said they cooked more themselves since the onset of the pandemic, with an emphasis on using fresh foods (Deutsches Tiefkühlinstitut, 2021). Furthermore, they pay more attention to the quality of the products they consume, which could explain why the organic sector in Germany saw a significant increase in sales (DP04). Following social principles for the public good (Migliore et al., 2015), people increasingly started to support local sustainable businesses, which was also evident in the results of the survey conducted for this thesis. 29 % of all respondents said that their food shopping habits had changed due to the pandemic. Of these 29 %, a total of 23 % said that they have developed a greater awareness of food. This category includes buying more local, organic, seasonal, zero-waste and higher-quality products.

Furthermore, of the 29 % who noted a change in their grocery shopping behaviour due to the pandemic, 14 % said they now purchase more groceries via delivery/online ordering. Developments such as this can open the door to organic vegetable box providers, who, based on their carbon

footprint, can have a better impact on the environment than individual customers who drive to buy organic vegetables (Coley et al., 2009). In addition, such local organic boxes can raise awareness of problems in the food system and build social relationships, which in turn can lead to a change in consumer practices (Torjusen et al., 2008). However, interviewee DP03 also voiced concerns that developments during the height of the pandemic, with an increase in people pre-ordering their food online or having it delivered directly to their homes, could also lead in the opposite direction, with people continuing to order from large supermarkets without caring about the origin of the products or related social connections.

In addition to the Covid-19 pandemic, another disruptive shock that is happening in Europe at the moment is the war in Ukraine. In these times when some commodities such as sunflower oil are becoming scarce in the globalised food market, local initiatives dealing with locally produced goods have the advantage of still having sufficient supplies (SH01). And with rising energy prices, there is a possibility that the rate of increase in the price of conventional products will be even higher than organic products (DP04), as the production of chemical fertilisers used in this type of agriculture is very energy intensive (SH01; DP04). This might have a positive impact towards a more sustainable consumption behaviour of price-sensitive but solvent consumers. However, there is also a risk that people will return to less sustainable and cheaper products due to the high inflation rates unleashed by the war (FA01; SH01; DP04).

6 Discussion

Having identified the current situation, barriers and potential opportunities and solutions for sustainable food distribution initiatives in the rural district of Augsburg, this chapter will offer additional reflections on the interconnections in the system, potential transition pathways, the need for effective networking and the implications of recent disruptive shocks.

Despite the fact that the levels of the MLP are very clearly distinguished in the definition of the analytical framework, it became clear during the case analysis that the examination of the existing and potential interactions between them is not so straightforward. Sometimes elements of niches break through to regimes without including the rest of the alternative practices (Smith, 2007), e.g. supermarkets in the rural district of Augsburg selling local, organic products without fostering social relationships to reconnect producers and consumers. Regime contexts and niche practices thus have a dynamic relationship in which ideas, (un)welcome events or practices that originate in one are translated into practices or ideas in the other, without necessarily incorporating the all-encompassing thinking behind the original development of those ideas or practices (Smith, 2007).

Against this background, an attempt can be made to situate the developments in the food system of the rural district of Augsburg in the different types of transition pathways defined by Geels et al. (2016) and explained in Chapter 3. As was established earlier in this thesis, transition pathways in the MLP are not mutually exclusive and can shift from one to the other. This phenomenon can also be observed in the case of this thesis. The dynamic of regime actors who were initially faced with increasing pressure from the policy level, as well as with changing preferences of some users, and who then adapted by starting to include local, organic food in their product range can be classified as belonging to the transformation pathway. The disruptions at the landscape level caused by the Covid-19 pandemic and, more recently, by the Russian war in Ukraine, then steered the transition more towards the substitution pathway. However, this only happened in very specific areas or for very specific products, such as sunflower oil, when customers switched from large shops to smaller shops selling locally produced oil due to supply shortages in the globalised food market. All in all, a major transition has not yet taken place, meaning that sustainable local provision still remains largely in its niche. However, even if these change processes are not yet radical, they can lead to more fundamental change in the long term, which then becomes visible on a larger scale (Strambach & Pflitsch, 2016). Such a process is difficult to predict because it is based on complex dynamics that make it almost impossible for a group of actors to steer in a certain direction (Pflitsch & Strambach, 2018; Smith, 2007). It can also take years for a change in policy or the definition of new user preferences to have an impact on the system (Geels, 2004). Socio-technical transitions are thus non-linear and open-ended

evolutionary processes that involve the crucial elements of experimentation and learning (Geels, 2020a). These elements need to be promoted by the niche actors in the rural district of Augsburg. So far, however, an all-encompassing shift of the conventional food system in the direction of short supply chains, localisation and organic food production is prevented by the power concentration in large-scale organisations that lock the globalised industrial food system in place (Hvitsand et al., 2022). Therefore, it can be said with relative certainty that despite recent minor changes that have been taken up by some actors in the existing regime, the food system in the rural district of Augsburg still has a long way to go to successfully implement sustainable practices among all actors in the regime.

In this context, idealism, though helpful at the outset in establishing niche networks, can later be an obstacle to institutional integration (Smith, 2007). Interpretations and beliefs determine actors' interests and shape their preferences and motivations, so that transitions may involve struggles due to discrepancies between the interpretations and beliefs of different actors (Geels, 2020a). This might prevent niche and regime actors from working together on the transition pathway and thus pose an obstacle to the implementation of a large-scale sustainable food system. Therefore, the networking at the level of niche innovations, which was much called for in the interviews in order to gain momentum and increase the pressure on the existing regime, can only be successful if the actors overcome their potential differences and manage to work together in meaningful collaborations. A sympathetic attitude between niche actors and regime actors seems to be of particular importance in pursuing a transition pathway of reconfiguration, meaning that niche innovations and the existing regime work together to alter the architecture of the food system. While there were some undertones in a number of the interviews conducted with niche actors when they talked about problems with regime actors, possibly due to frustrations the niche actors had to deal with, there was nonetheless understanding of the regime actors' points of view. Overall, it became clear in the interviews that the predominant aim was to find common ground in order to work together towards a better future.

As was noted in Chapter 5, especially the recent prevalence of disruptive shocks such as the Covid-19 pandemic or the Russian war in Ukraine, with their global supply chain disruptions, were frequently cited as challenges and opportunities for collective change in the food system. The resilience of food system supply chains is crucial for food security (Béné, 2020), which is why aspects such as food availability and access need to be put on the agenda for designing a more sustainable food system (Ericksen, 2008). This is true not only in the face of pandemics or wars, but also in the face of the climate crisis, as there is a risk that the largely centralised food distribution infrastructure in the Global North will be increasingly damaged by extreme weather events in the future (Soubry, 2021). For the time being, the question remains whether the development towards more sustainable consumption practices as observed in the food system of the rural district of Augsburg, due to the shock of the

pandemic, will still hold true as daily life returns to normal. For now, the rise in the organic sector is continuing and increasing (DP04). The impact of the relatively recent shock from the Ukraine war has not yet been explored but could potentially lead to people buying cheaper and less sustainable food again due to increased inflation. These effects could also be studied over the long run through the MLP, as it is particularly useful for analysing long-term dynamics (Geels, 2004).

7 Concluding remarks

To conclude, the aim of this thesis was both to contribute to strengthening the position of a sustainable food system in the rural district of Augsburg, as well as to generate knowledge about the currently existing challenges and barriers, and how they can potentially be addressed. This was done by conducting expert interviews with stakeholders and surveying the population representing potential consumers, all supported by carrying out a literature review. The single-case study design helped to develop a deep understanding of the dynamics prevalent in the specific case of the rural district of Augsburg. The framework of the Multi-Level Perspective proved to be a helpful analytical tool to identify the different actors and phenomena present in the food system of the rural district of Augsburg, as well as existing and potential interactions between them.

The findings showed that there are several types of alternative food networks that have been initiated in the context of working toward a more sustainable food system. However, it was also shown that these niche innovations are not yet sufficient to be accessible for the whole rural district of Augsburg. The barriers that prevent the niche initiatives from scaling up and breaking through to the mainstream were identified to be mostly located at the level of the socio-technical regime. These main barriers solidified in terms of logistics/infrastructure, regulations and customer preferences. Finally, it was explained how the obstacles can be addressed at the niche level (creation of networks, support from local authorities), at the regime level (change of customer practices through awareness raising or financial support, implementation of elements from niches by regime actors, more mindfulness in the political system) and at the landscape level (decentralisation, disruptive shocks). These findings could be used as an entry point for actors from the rural district of Augsburg wanting to drive the development of the food system towards a more sustainable direction. Especially, the creation of networks amongst the niche innovation actors seems to be a feasible and wished for measure to be taken in order to gain momentum and put pressure on regime actors.

Future research could focus on whether the changes in the food system that occurred due to the ongoing Covid-19 pandemic and the more recent disruptive shock of the Ukraine war will lead to a long-term shift in the socio-technical regime towards a more sustainable food system in the rural district of Augsburg. While this thesis focused on the implementation of alternative food networks that distribute locally and organically produced foods, I recognise that there are several other issues that feed into the unsustainability of the current food system that were not part of this research, such as high meat production with all its implications. I have no doubt that we still have a lot to learn about the successful implementation of transition pathways towards more sustainable food systems including local and organic products in our increasingly globalised world faced with an ecological crisis.

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Appendices

Appendix A. Interview guide

This interview guide is an example of one interview that was conducted. The order of the questions and the number of questions asked per interview varied. Furthermore, the questions were adapted to the context of the interviewees. Additional questions that came up during the conversation were also addressed. Interview-specific questions can be reconstructed by reading the transcripts of the interviews.

Table A1. Interview questions

No	Question
Individual questions about their work	
1	What is the main objective of the initiative you work for?
2	How did you personally get involved, what made you want to do it?
More general questions about the situation in the rural district of Augsburg	
3	How would you describe the current situation of supply with local, sustainable food in the rural district of Augsburg?
4	What is happening in terms of local, sustainable initiatives?
5	How are these initiatives being supported? Maybe also from the existing structures?
6	In the city of Augsburg there is the Local Agenda 2021, which is mainly active within the city area with its agenda forums. Do you have contact with them in your work?
7	In your work, do you notice differences between the more urban population and the population of the more rural areas in terms of interest in and appreciation of sustainable, locally produced products?
8	What is your ideal vision for sustainable local provision in the rural district of Augsburg?
9	What do you think needs to happen for us to be moving in the direction of this ideal?

Appendix B. Map of the rural district of Augsburg

Figure B1. The rural district of Augsburg (Landkreis Augsburg, n.d.). The map shows all 46 municipalities of the rural district of Augsburg (marked orange), as well as the city of Augsburg (marked white).

Appendix C. Original quotes for the direct in-text quotes

Table C1. Original quotes used for direct in-text quotations

Original quote in German	Translated quote in English
"Also die EU hat die Tendenz, dass man Verbraucherschutz sehr hoch setzt, was ja grundsätzlich erstmal nichts verkehrtes ist. Das hatte aber 2009 zum Beispiel zur Folge, als man die Vorschriften für selber schlachten und selber metzgern so hoch gesetzt hat, dass dann auch als kleine Metzgerei brauche ich eine Desinfektionsstraße, wo ich durch muss. Ich muss meine Wände überall wandhoch kacheln und für viele Metzgereien waren das immens hohe Kosten. Und da wird von den Anforderungen von der EU nicht unterschieden zwischen einem Großunternehmen und einem Kleinstunternehmen. Und für die Kleinstunternehmen macht das anteilig am Umsatz aber wesentlich mehr aus sowas umzusetzen, als für ein großes Unternehmen. Dementsprechend haben viele Metzgereien seitdem bei uns aufgehört oder es gab dann keine Nachfolge mehr, weil die einfach gesagt haben, das ist vom Kosten-Nutzen-Faktor für uns nicht mehr interessant." (DP02; p. 13)	„The EU has a tendency to set consumer protection at a very high level, which is in principle not a bad thing. But in 2009, for example, when the regulations for slaughtering and butchering were set so high, that even as a small butcher's shop I need a disinfection line I have to go through, I have to tile my walls wall-high everywhere. And for many butchers that was an extremely high cost. And the EU requirements do not differentiate between a large enterprise and a micro-enterprise. And for micro-enterprises, it makes much more of a difference in terms of turnover than for a large company. As a result, many butchers have stopped working here since then, or there was no succession, because they simply said that from a cost-benefit point of view, this is no longer interesting for us." (DP02; p. 13)
„Regionale Weiterverarbeitungsmöglichkeiten also das ist ein riesen riesen Thema. Also wir haben jetzt einen Dinkel geerntet, letztes Jahr schon. Und alleine nur dieses wo entspelze ich den, wo mahle ich den? Ich fahr so im Zickzack spazieren, es kostet ein Schweinegeld, dass wir schon eigentlich gesagt haben, es rentiert sich nicht. Weil was ich brauche, um das Ding überhaupt in die Tüte zu bringen, da liegt es beim Lidl fertig im Regal." (FA03; p. 10)	"Regional processing options are a huge topic. So we have harvested spelt now, last year already. And just these things alone, where do I husk it, where do I mill it? I'm driving around in zigzags, it costs a lot of money, so we've already said that it's not worth it. Because for what I need to get the thing into the bag in the first place, it is already ready lying on the shelf at Lidl." (FA03; p. 10)
„Nahversorgung, Ernährungssicherheit, sollte jedes Land auf seine politische Agenda schreiben. Das gab es in den letzten Jahrzehnten gar nicht." (DP04; p. 7)	"local provision, food security, should be on every country's political agenda. This was not the case at all in the last decades." (DP04; p. 7)
„Leute, die selber das nicht gelernt haben. Politiker sind ja auch nur Menschen, ja, und die hocken quasi in ihren Entscheidungspositionen mit dem, was sie auch an Wissen aufgesaugt haben und an Erfahrungen mitgenommen haben in ihrem Leben." (SH01; p. 4)	"People who have not learned this themselves. Politicians are only human, too, and they sit in their decision-making positions with the knowledge they have absorbed and the experience they have gained in their lives." (SH01; p. 4)

„Zusammenhänge in dieser ganzen globalen vernetzten Lebensmittel- oder Produktschiene ist vielen überhaupt nicht bewusst. Dass da am meisten halt immer noch auch Personalkosten reinzählen und auch der Herstellungsprozess selber ist nicht immer so geregelt und so hoch angesetzt wie bei uns, wenn das ein Bioland-Betrieb ist. (. . .) Also Bio aus Peru ist eine ganz andere Geschichte von der Herstellung. Genau und da fehlt es einfach an Hintergrundwissen." (SH01; p. 2)	"Many people are not at all aware of the linkages in this whole globally connected food or product sector. That labour costs still count for the most part, and that the production process itself is not always as regulated and as high as it is here, if it is a Bioland farm. (. . .) Organic from Peru is a completely different story in terms of production. This is precisely where there is simply a lack of background knowledge." (SH01; p. 2)
„Ich fühle mich nach wie vor schon bisschen wie ein Alleinkämpfer. (. . .) Ich weiß überhaupt nicht, wer um mich rum ist. Also klar, ein paar, aber wenn sie dann ein bisschen weiter weg sind, eigentlich weiß ich das so (. . .) gar nicht. Also da würde ich mir schon gerne mehr Austausch wünschen." (FA03; p. 6)	"I still feel a bit like a solo fighter. (. . .) I don't know at all who is around me. Well, sure, a few, but if they are a bit further away, I don't actually know (. . .) at all. So here I would like to see more interaction." (FA03; p. 6)
„Aus meiner Sicht bleibt da auf mittelfristige Sicht keine andere Wahl. Weil Lebensmittel sind verderblich. Lebensmittel müssen just-in-time (. . .) konsumiert werden (. . .). Und es ist einfach nicht das prädestinierte Produkt, um zehntausende Kilometer zurückzulegen. Und deswegen müssen wir (. . .) zu regionalen Strukturen zurückfinden, aus ganz pragmatischen Gründen." (FA01 & FA02; p. 2)	"In my view, there is no other choice in the medium run. Because food is perishable. Food has to be consumed just-in-time (. . .). And it is simply not the predestined product to travel tens of thousands of kilometres. And that's why we (. . .) have to find our way back to regional structures, for completely pragmatic reasons." (FA01 & FA02; p. 2)
„Wissen und Bildung. Angefangen von den ganz Kleinen, aber auch die Erwachsenen. Damit meine ich dann wirklich Kampagnen, die mehr machen als nur, ich hab in der Zeitung irgendeinen Aufdruck, wo gar keiner liest." (SH01; p. 10)	"Knowledge and education. Starting with the very young, but also adults. By that I really mean campaigns that do more than just have something printed in the newspaper that no one reads." (SH01; p. 10)

Appendix D. Rules in regimes

Table D1. Examples of rules in different regimes (adapted from Geels, 2004, p. 906).

	Regulative rules	Normative rules	Cognitive rules
Technological regime	Technical standards	Testing procedures	Problem solving strategies
Science regime	Rules for government subsidies	Norms for citation	Methods of knowledge production
Policy regime	Subsidy & procurement programmes	Institutional commitment to existing systems	Ideas about the effectiveness of instruments
Socio-cultural regime (societal groups, media)	Rules which structure the spread of information production of cultural symbols	Ways in which users interact with firms	Ideas about impacts
User and market regime	Construction of markets through laws and rules (market subsidies, tax credits to users, safety requirements)	Mutual perceptions and expectations between users and firms	User practices and preferences

Appendix E. Survey design

The survey questions were divided into seven different sections as indicated below. The original questions were formulated in German, the list below shows the English translation.

Table E1. List of survey questions

Number	Question	Type of questions
Section 1		
01	How old are you?	Single choice
02	Which gender do you identify with?	Single choice
03	What is your occupation?	Single choice
04	Where do you live?	Single choice
05	If you work outside of your home: Where is your workplace located?	Single choice
Section 2		
06	How do you provide for your food needs?	Single choice
07	In which types of shops do you regularly buy food?	Multiple choice
08	Do you regularly buy food online?	Single choice
09	Do you have any form of food subscription (e.g. fruit/vegetable box, community supported agriculture, etc.)?	Single choice
10	How many different places (shops, markets, online shops, etc.) do you regularly buy food from?	Single choice
Section 3		
11	Where are most of your main shopping places located?	Single choice
12	What is the approximate distance between your home and your preferred shops?	Multiple choice
13	Which means of transport do you use for your shopping?	Multiple choice
14	How much money do you spend per person per week on food in your household?	Single choice
Section 4		
15	Has your food shopping behaviour changed as a result of the COVID-19 pandemic in the last two years?	Single choice
16	If yes: In what way has your shopping behaviour changed?	Open question

Section 5		
17	What product characteristics are important to you when shopping for food?	Multiple choice
18	Which product characteristic has the highest priority for you?	Single choice
Section 6		
19	Please tick to what extent the following statements apply to you:	Likert scale
	- I mainly buy food from discounters/supermarkets. - I buy food mainly in small, independent shops. - My purchase decisions are shaped by habit. - I use trends for orientation when buying food. - I value personal contact and possibly consultation when shopping. - I prefer organic/local products to products from large corporations. - I behave/live in an environmentally conscious way. - There are sufficient opportunities to supply myself in my immediate vicinity. - There are sufficient opportunities to buy local food in my immediate vicinity. - There are sufficient opportunities to buy organic food in my immediate vicinity. - There are sufficient opportunities to buy local, organic food in my immediate vicinity.	
Section 7		
20	Is there anything else you would like to tell me?	Open question