Universidade de Évora - Instituto de Investigação e Formação Avançada
Universidade dos Açores Universidade de Lisboa - Instituto Superior de Agronomia

Programa de Doutoramento em Gestão Interdisciplinar da Paisagem

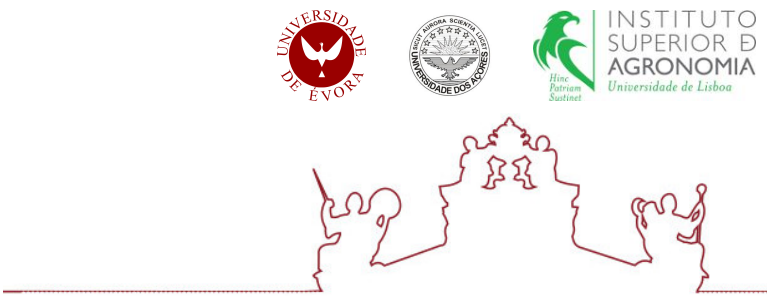
Tese de Doutoramento

Patterns, strategies and challenges for rural residents to access local foods

Paola Andrea Hernández

Orientador(es) | Teresa Pinto-Correia
Catherine Darrot
Mónica Truninger de Albuquerque de Medeiros Sousa

Évora 2024



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A tese de doutoramento foi objeto de apreciação e discussão pública pelo seguinte júri nomeado pelo Diretor do Instituto de Investigação e Formação Avançada:

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Évora 2024

SUMMARY

This Research Thesis discusses food and nutrition security issues emerging from the development of Local Food Systems in rural areas of Portugal. Its goal is to identify what are the patterns, strategies, and challenges driving local food consumption, with a focus on rural areas. It starts by mapping the Local Food Networks (LFN) that bring local foods to the market in Portugal, identifying two types of Local Food Networks (LFN) in Portugal: 'versatile' and 'fixed' networks. With the aim to comprehend whether any socio-economic and political aspects affect local food consumption, it explores food access issues using a framework for comparing territorial specificities. Ethnographic work aimed to comprehend the array of perspectives and practices surrounding consumption of local foods in rural areas in Portugal. We used a proposed analytical framework to reveal consumers' understandings, patterns, and perceptions on local foods. At the end, the thesis examines small farm integration in local food systems through market, reciprocity, and redistribution structures. The findings highlight the complexity of local food systems in this country, emphasising the interplay between geography, socio-cultural aspects, and governance. The research suggests that current rural development approaches might perpetuate urban-rural divides in Portugal and provides valuable insights for policymakers and stakeholders aiming to support local food initiatives and promote vibrant rural communities in alignment with EU strategies.

Keywords: local food systems, rural development, consumer-centred, territorial approach, food and nutrition security

RESUMO

Título da tese de dissertação:
"Padrões, estratégias e desafios para os residentes rurais consumirem alimentos locais"

Esta Tese de Investigação discute questões emergentes de segurança alimentar e nutricional no desenvolvimento de Sistemas Alimentares Locais, em zonas rurais de Portugal. O seu objetivo é identificar quais são os padrões, estratégias e desafios que impulsionam o consumo local de alimentos, com foco nas áreas rurais. Começa por mapear as Redes Alimentares Locais (RAL) que levam os alimentos locais ao mercado em Portugal, identificando dois tipos de RAL no país: redes 'versáteis' e 'fixas'. Com o objetivo de compreender se alguns aspectos sócio-económicos e políticos afetam o consumo alimentar local, explora as questões de acesso aos alimentos utilizando um quadro de comparação das especificidades territoriais. O trabalho etnográfico teve como objetivo compreender a variedade de perspectivas e práticas em torno do consumo de alimentos locais em áreas rurais em Portugal. Utilizámos um quadro analítico proposto para revelar os entendimentos, padrões e perceções das pessoas residentes nas zonas rurais sobre os alimentos locais. No final, a tese examina a integração das pequenas explorações agrícolas nos sistemas alimentares locais através das estruturas de mercado, reciprocidade e redistribuição. Os resultados destacam a complexidade dos sistemas alimentares locais neste país, enfatizando a interação entre a geografia, os aspectos socioculturais e a governança. A investigação sugere que as atuais abordagens de desenvolvimento rural podem perpetuar as divisões urbano-rurais em Portugal e fornece informações valiosas para os decisores políticos e as partes interessadas que pretendem apoiar iniciativas alimentares locais e promover comunidades rurais dinâmicas.

Palavras-chave: sistemas alimentares locais, desenvolvimento rural, centrado no consumidor, abordagem territorial, segurança alimentar e nutricional

ACKNOWLEDGEMENTS

I would like to thank the following people for accompanying me through this doctoral journey and to develop this research project. First outermost, a thank you to my three research supervisors, Mónica Truninger, Catherine Darrot, and Teresa Pinto-Correia, for enriching this work with your critical perspective in the sociology and geography disciplines. Your insights always kept me in check and without them I would have been far more lost. Special thanks to Teresa Pinto-Correia for inviting me to join the SALSA project at the University of Évora and start my career in family farming in Portugal. To colleagues in the discipline Maria Rivera, Carolina Yacamán, Renata Menasche, Sergio Schneider, Doriane Guennoc, Emiliana Silva, José Muñoz-Rojas, José da Veiga, Simron Singh, and the many others who have served as lighthouses during my baby steps in research.

My gratitude goes to the Funding Institute for Science and Technology in Portugal (FCT) for funding this research project under the PhD Scholarship SFRH/BD/146108/2019 and under the Project UIDB/05183/2020.

Thank you to MED – Mediterranean Institute for Agriculture, Environment and Development at the University of Évora for serving as my hosting institution.

To the survey respondents, the people interviewed, those whom I conversed on the streets, and anyone who has sat with me to discuss food issues, while enjoying a good meal and a glass of wine.

To the City Hall of Évora, Mértola and Arouca for providing support to carry out fieldwork in early 2023 in those three municipalities.

Words cannot express my gratitude to Elia Pires-Marques and Giuseppe Cillis for their help with the maps. To André Russo for the impeccable editing work. Language proofreaders André Oliveira, Alexia Gezink, Isaac Spencer, and Maria Coelho. I would like to recognise the support given by the colleagues at the Labscape Research Lab of MED, Mediterranean Institute for Agriculture, Environment and Development. I also thank my friends and community members who supported me emotionally in one way or another, in the distance and nearby, and who made this thesis a community project. Alexia Gezink, Andreia Fernandes, André Vitor, Carlos Omaña, Cristian Trujillo, Edward Celeno, Francesco Valeiro, Helene Gichenje, Joaquin Canay, João Angrola, João Oliveira, Kristina Likhacheva, Leonel Alegre, Matthew Laing-Gibbard, Michael Clark, Taiana Conceição, Tarciano Siqueira, Ximena Maier. However, most importantly this endeavour would not have been possible without the loving support of my parents and siblings, who have always trusted me in all my adventures.

Nevertheless, my deepest gratitude to all food producers who are keeping the human species on the roll. Your are the inspiration of this research.

A mi madre
a quien le debo todo y más,
gracias por saber guiar

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LIST OF ACRONYMS

ACRONYM	ENGLISH	PORTUGUESE
AAFN	Alternative Agri-Food Networks	Redes Alternativas Agroalimentares
AFN	Alternative Food Networks	Redes Alternativas Alimentares
AML	Metropolitan Area of Lisbon	Área Metropolitana De Lisboa
CAP	EU Common Agricultural Policy	Política Agrícola Comum Europeia
CNA	National Confederation of Agriculture	Confederação Nacional Da Agricultura
CSA	Community Supported Agriculture	Agricultura Apoiada Pela Comunidade
DGADR	Directorate-General for Agriculture and Rural Development	Direção Geral De Agricultura e Desenvolvimento Rural
DGDR	Directorate-General for Rural Development	Direção Geral para o Desenvolvimento Rural
EU	European Union	União Europeia
EUROSTAT	European Commission Database Statistics	Estatística Das Comunidades Europeias
FAO	United Nations Food and Agriculture Organization	Organização das Nações Unidas para a Agricultura e a Alimentação
FCT	Portuguese Foundation for Science and Technology	Fundação para a Ciência e a Tecnologia
FF	Family Farming	Agricultura Familiar
GAV	Gross Added Value	Valor Acrescentado Bruto
GDP	Gross Domestic Product	Produto Interno Bruto
GEVPAL	Portuguese Working Group for The Valorisation of Local Agricultural Production	Grupo de Trabalho para a Valorização da Produção Agrícola Local
HH	Household	Agregado Familiar
HORECA	HORECA Industry – Hotels, Restaurants and Catering	Indústria De Serviços Alimentares – Hotéis, Restauração e Catering
INE	Portuguese Statistics Institute	Instituto Nacional de Estatística
LF	Local Food Shop	Loja De Produtos Locais
LFN	Local Food Networks	Redes Alimentares Locais
LFS	Local Food Systems	Sistemas Alimentares Locais
NUTS	Nomenclature of Territorial Units for Statistics	Nomenclatura Comum das Unidades Territoriais Estatísticas
PDO	Protected Denomination of Origin	Denominação de Origem Protegida

PGI	Protected Geographical Indication	Indicação Geográfica Protegida
PR	Predominately Rural	Área Predominantemente Rural
PROVE	Portuguese Box Scheme Model “Promote and Sell”	Modelo De Cabaz Alimentar “Promover E Vender”
PU	Predominately Urban	Área Predominantemente Urbana
RAL	Local Food Networks	Redes Alimentares Locais
RD	Research And Development	Investigação e Desenvolvimento
RDP	Rural Development Programme	Programa de Desenvolvimento Rural
SALSA	Horizon 2020 Project – Small Farms, Small Food Businesses and Sustainable Food and Nutrition Security	Projeto Horizonte 2020 – Pequena Agricultura Familiar, Pequenos Negócios Agroalimentares e a Segurança Alimentar e Nutricional Sustentável
SDG	Sustainable Development Goals	Objetivos de Desenvolvimento Sustentável
SFB	Small Food Businesses	Pequenos Negócios Agroalimentares
SFSC	Short Food Supply Chain	Cadeia de Abastecimento Curta
SU	Sub-Urban Area	Área Mediamente Urbana
TGP	Temporary Geographical Proximity	Proximidade Geográfica Temporária
TIPAU	Typology of Urban Areas	Tipologia De Áreas Urbanas
UAA	Utilised Agricultural Area	Superfície Agrícola Utilizada
UN	United Nations	Nações Unidas
UNESCO	The United Nations Educational, Scientific and Cultural Organization	Organização das Nações Unidas para a Educação, a Ciência e a Cultura
USP	Unique Selling Point	Ponto de Venda Único

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CHAPTER 1

GENERAL INTRODUCTION

CHAPTER 1.1

LANDSCAPE MANAGEMENT

According to the Council of Europe's Landscape Convention,

> landscape management "means an action, formulating a perspective for sustainable development, to ensure the regular maintenance of a landscape, in order to guide and harmonise the changes brought about by social, economic, and environmental processes."
>
> (European Landscape Convention, 2000)

The hereby presented doctoral research can be situated within the Landscape Management debate related to the rural, as it concerns the activities compromising the sustainability of rural communities and of the land use systems they are surrounded by (Woods 2011). We take the territory as the material basis of the landscape, a word that etymologically refers to something 'coming from the land, land that is worked on and lived in, and that inherits a status of authenticity, is land-based, and is embedded to a place (Salvado et al., 2018; own translation). The distinctiveness of places, regions and even countries relies heavily on landscape characteristics, which contribute centrally to people's quality of life but that are being eroded by different and powerful forces (Selman, 2006; Woods 2011). Food systems are part of these forces and relate directly to the landscape as an integrative concept.

Landscape management involves guiding activities that could modify the landscape. In rural areas, this is closely related to land use planning, where conflicts are addressed and decisions are taken, on the spatial distribution and resource use around agricultural practices, forestry, nature

conservation, as well as settlements and rural infrastructure development (Hodge 2016). Proper infrastructure is essential for connecting rural areas to urban centers, markets, and essential services and could contribute to rural development.

Landscape management is tied to socio-economic development. Rural communities have historically relied on agriculture and related industries. Managing the rural territories effectively can create adequate conditions for strong agricultural and forestry sectors, enhance opportunities for other activities to grow, support the creation of jobs and improve the overall socio-economic well-being of the rural population.

Landscape management is also about safeguarding the natural resources and the access to the same. In rural areas, this implies management of water resources, soil health, biodiversity, forests, and arable land.

Considering public aspirations and involving local communities in landscape management processes are vital for rural development. Empowering local communities to participate in decision-making regarding their landscapes, through locally adapted governance mechanisms can support sustainable development practices tailored to their specific needs (Hodge 2016).

By addressing these issues within the context of landscape management, rural development initiatives can be more holistic, creating conditions for ensuring the well-being of both the environment and the communities relying on it.

CHAPTER 1.2

RESEARCH SITUATION

The transformation of food systems and the rise of urbanisation in Europe throughout the last century have significantly reshaped how food is produced and consumed. This shift has led to the globalisation of food systems, concentrating control within the agri-food sector and weakening social ties. To counteract these challenges, supporting small and family farmers has emerged as a solution, emphasizing their integration into short food supply chain (SFSC) initiatives. These initiatives, grounded in principles of proximity and trust, minimize intermediaries between producers and consumers based on geographic distances. They are claimed to enhance local food systems by leveraging local resources and promoting regional processing, while enabling small producers to manage food surpluses.

The debate on local food systems traces back to the 1960s, gaining momentum in the 1990s in Europe as a response to concerns about food safety, environmental degradation, and power imbalances. Despite these discussions, a universally accepted definition of local food remains elusive. Local Food Systems (LFS) have been praised for empowering small-scale farmers, promoting resilient territories, and mitigating environmental impacts. However, a comprehensive analysis of LFS requires examining their impact on social structures, power dynamics, and rural landscapes. Studies in food studies have missed to raise critical questions about the broader implications of local food consumption, particularly in non-urban regions.

In Europe, the discourse on Local Food Systems has primarily centered on their potential contributions to rural development from a food production perspective, leaving gaps in understanding

how non-urban consumers access local foods and how these systems shape rural areas. While existing literature emphasises the benefits of local food production and consumer support, crucial consumption-related issues, such as social justice concerns, have been sidelined. There is a pressing need to adopt a territorial perspective, especially if we consider that local food networks are complex elements with a pivotal role in defining these areas.

Understanding the significance of 'local food' and use by rural residents is vital and should be placed at the centre of the discussions about the revitalisation of rural areas in Europe. Developing a shared understanding can illuminate the diverse interpretations and cultural values associated with locally sourced produce and target strategies according to each territory's needs. Additionally, exploring the patterns and perceptions of local food consumption among rural residents can offer insights into the factors guiding their choices, including people's motivations and affordances for utilising these foods.

Recent governance frameworks for the assessment of food systems emphasise the sustainability of local food systems. A systemic approach can aid to recognise the role of all actors along the food chain. Small food businesses, for example, can play a pivotal role in short food supply chains, fostering direct relationships with local small farms, maintaining local ownership and utilising regional food resources. However, the success of collaborations between small food businesses and small producers hinges on various contextual factors, including market infrastructure and the complexities of scaling up local food initiatives.

Local food systems are not a one-size-all solution to solve all developmental issues throughout the continent. Their stability must not be taken for granted, for several micro-environmental factors, such as logistics and supply chains, impact the competitiveness of small food businesses in partnering with small producers. These challenges are intricately linked to the limited retailing capacity of

small farms and small food businesses and the complexities involved in expanding Local Food Networks.

In other words, scrutinising the social dynamics and concerns linked to local food consumption in rural areas is essential, especially if rural vitalisation is a centre piece in the vision for rural development. Attaining such goal will require considering the social networks, traditions, and community dynamics fostering this trend, while addressing challenges such as economic implications, environmental sustainability, and disparities in access. A consumer-centred and territorial approach can facilitate the promotion of local food systems in rural areas, by defining context-based solutions for small family farms to thrive economically while promoting healthy and environmentally-friendly food systems, especially considering the increasing depopulation of rural areas in Europe today.

CHAPTER 1.3

RESEARCH ROADMAP

This research work aims to complement the scientific knowledge collected during the Horizon 2020 SALSA Project – *Small Farms, Small Food Businesses and Sustainable Food and Nutrition Security* (2016-2020). Through SALSA we learned that small producers develop different strategies to remain resilient in food systems (Guarin et al.2020) and that their contribution to rural development could be measured in terms of their capacity to produce food (Rivera et al. 2020).

We argue that rural development can be discussed in terms of the capacity of a territory to sustain and retain its population. Small and family farms can play a key role in revitalising rural areas and mitigating climate change effects. Moreover, the promotion of small family farms, sustainable food systems, and resilient communities are top political priorities in Europe today (e.g., The EU 10-year Framework of Programmes on Sustainable Consumption and Production Patterns envisions that "All food systems are sustainable, delivering food security and nutrition for present and future generations" (UNEP, 2017 cited in Bilali et al., 2018). This research aims to increase knowledge pertaining reaching two Sustainable Development Goals (SDG) of the UN Agenda 2030: Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture; and Goal 12. Ensure sustainable consumption and production patterns. It specifically furthers knowledge about the role of local food systems in the promotion of these two goals.

The scientific interest for this research project was raised during fieldwork within the SALSA project with small producers in western region of Portugal (Oeste), upon concerns over the food

security of rural communities in regions where industrial farming prevails, even at the small scale. The research leading to this thesis work was funded by the National Funds through FCT - Foundation for Science and Technology in Portugal under the PhD Scholarship SFRH/BD/146108/2019 and under the Project UIDB/05183/2020. It started in November 2018 and ended in October 2023 with the completion of this manuscript.

RESEARCH OBJECTIVES

To confirm whether concerns over people's food and nutrition security were substantiated or not in rural areas, this research project was guided by the main research question,

What are the patterns, strategies and challenges for rural residents to access local foods?

The research hereby presented was based on the understanding that residents in rural areas have a longstanding relationship with food production despite recent developments changing the profile of rural areas, especially in Europe. The following research sub-questions (SQ) directed the research logic throughout this investigative work:

SQ1. What formal initiatives are making local foods available to nearby consumers?

SQ2. What are the enabling conditions promoting local foods in rural areas?

SQ3. What patterns and preferences do rural residents have to consume local foods?

SQ4. How are small farms being integrated into local food systems?

This research project adopted a consumer-centred and territorial approach. We shifted away from an urban-focused perspective on consumption issues to fill in this knowledge gap in rural areas. A territorial approach was adequate because it assumes the territory is much more than a simple geographical area, but a set of complex material and immaterial relations among actors and scales

and between them and local resources (Barbera et al., 2014). Two concepts are core in this research work: local foods and rural areas.

Local food: is a concept that arose as a 'solution' to the negative externalities associated with the globalised and industrialised food system. In Europe, Local Food Systems (LFS) gained traction in the 1990s, addressing concerns about food safety, environmental damage, and power imbalances caused by industrial food. They are agued to offer small producers better returns, preserve local food traditions, foster collaboration, facilitate scaling up production, and rebuilding consumer trust through short food chain exchanges. They complement conventional markets, and in many places, they operate in niches. To date, however, there is no single or clear definition of 'local food'. Formal and informal exchanges of local foods between producers and consumers are commonly referred to as Local Food Networks (LFN), Alternative Agri-food Networks (AAFN), and Short Food Supply Chains (SFSC).

Rural areas: Just like with the term above, defining rural has proven challenging. It is a context-based concept often discussed in opposition to urban areas. According to Torre and Wallet (2020), how the 'rural' is apprehended by the public policies varies from country-to-country and is associated with a particular vision of rural and its place in the national development model. Given the research focus of this doctoral research was Portugal, we borrowed the TIPAU nomenclature proposed by Esteves (2014) to define rural areas. Formally referred to as predominately rural areas (PR), they correspond to geographical areas with no more than 100 inhabitants per square kilometer. Low population density is characteristic of predominately rural areas, and some even fall under the umbrella of remote regions. Depopulation in these regions is perceived as the effect of outmigration, aging, economic stagnation, impoverishment, and reduced access to public services and amenities that can promote growth.

CHAPTER 1.4

THESIS OUTLINE

The present thesis comprises four main chapters (to address each main question stated above). These four main chapters are preceded by a general introduction (Chapter 1) and followed by a section dedicated to conclusions (Chapter 6). The presentation of the chapters does not necessarily follow the research process, nor implies that a hierarchical order exists among the four food security dimensions. This subsection presents a summary of each main chapter and the thesis roadmap (Figure 1) for a visual representation of how the chapters are connected.

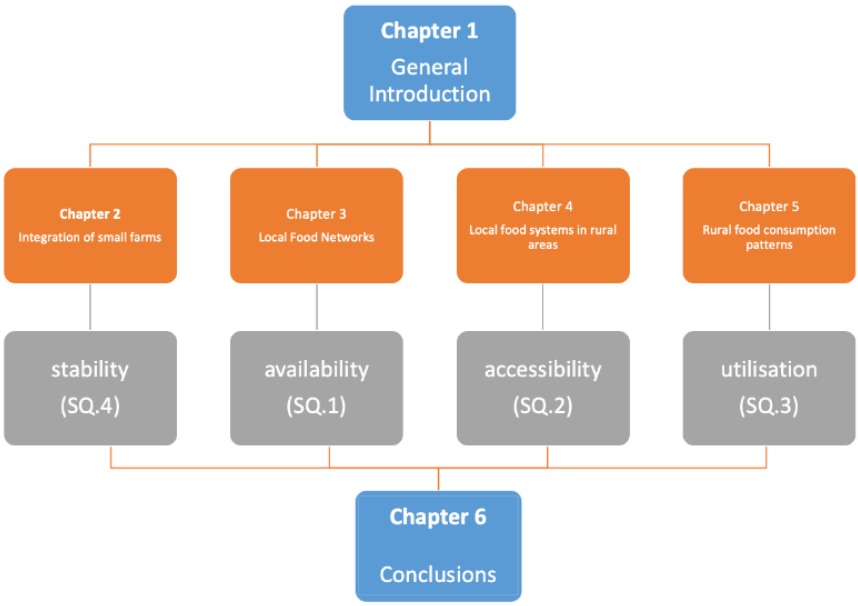

Figure 1. The four dimensions of food and nutrition security considered in the theoretical framework of this research project (Own elaboration)

Chapters 2, 3, 4 and 5 in this dissertation are linked to one of the research sub-questions presented above. Chapter 2 and 4 include two peer-reviewed articles published in scientific journals. The text has slightly been modified for this doctoral dissertation version. The research done in Chapter 3 includes an article that was submitted for publication and awaits acceptance. Each chapter is an opportunity to explore local food consumption through one of the Four Pillars of Food and Nutrition Security proposed by Bilali et al. (2018): availability, access, utilisation, and stability.

Chapter 2 | It lays out the ground for the research, positioning the role of small farms in the European context and the difficulties of small food businesses to integrate small family farms into regional food systems.

Context: For small farms across Europe, connecting to small food businesses offers a significant route to market. However, the interrelations influencing these businesses' behaviour in food systems impacts their capacity to link small food producers into regional and local food systems.

Objectives: to explore the capacity of small food businesses to integrate small farms in food systems. The goals were to show how connectivity depends on context-based interrelationships among food system actors and to explore the effects of these relations on small farm integration.

Methods: Survey data from 85 small food businesses in nine European regions was used to explore the enabling and limiting conditions around this connectivity.

Results and Conclusions: Results show stronger connections when small food businesses are themselves farm-based. Weaker linkages are also apparent in the absence of public and social support. We argue that regional food systems can be enhanced by increasing small food businesses' capacity to source from small farms, with the added benefit of increasing the viability of these small businesses.

Chapter 3 | It defines the research topic of this thesis, namely the development of local food networks in Portugal ('circuitos curtos' in Portuguese) as a potential pathway to promoting sustainable food systems.

Context: Following the economic crisis of 2010 in Europe, efforts to reconnect urban consumers to primary producers, while preserving natural and cultural heritage, have evolved in Portugal in the form of Local Food Networks. However, a clear vision of these networks' capacity to provision local foods to nearby residents is still lagging.

Objectives: to develop a mapping of the Portuguese local food networks to understand their behaviour and assess their capacity to make local foods available to consumers.

Methods: a non-exhaustive, desk-based mapping of Portuguese initiatives from November 2020 – March 2021, with information about key stakeholders, functioning logic, and the relational styles used during the food exchange.

Results and Conclusions: local food is primarily made available in the box scheme format, which operates in multiple municipalities, mostly in urban areas, with support of an online platform. Rural areas, conversely, showed a reduced availability of local foods and weak infrastructure of local food networks. We argue that the increased proliferation of local food consumption in Portugal is possible if territorially intelligent actors activate the needed resources for greater availability of local foods.

Chapter 4 | It focuses on the development of local food networks in rural areas of Portugal, specifically to understand what food environments might be hindering or promoting the emergence of LFN in these areas.

Context: Food consumption patterns are mostly studied around the rural-urban dynamics, urban food security, and the revitalisation of rural communities, but little is known about the impact of LFS over rural residents and their capacity to access local foods.

Objectives: to explore the development of Local Food Systems in rural areas and identify what conditions might enable the emergence of local food channels in these areas.

Methods: Based on the mapping of Portuguese Local Food Networks presented in Chapter 3, the 74 predominately rural municipalities were considered for further statistical data, considering six socio-economic and political variables for comparative purposes.

Results and Conclusions: The emergence of Local Food Systems in rural Portugal was strongly determined by the levels of mean income and education levels in rural municipalities. Three clusters of rural areas were identified from the sample '*meso-urban'*, (N=5) presenting urban-like characteristics, *'dense'*, characterised by high population density, road infrastructure and small-scale farming; and *'castaway',* with low population density, income, post-secondary education, and expenditure in Rural Development (RD) in agriculture.

Chapter 5 | It corresponds to the empirical contribution of this research project, presenting the fieldwork results in selected case studies in rural Portugal.

Context: Local food consumption in rural areas is a significant aspect of both cultural heritage and sustainable living in these areas. Understanding the nuanced meanings attached to 'local food,' the consumption patterns and perceptions of rural residents, and the social dynamics driving this trend is essential for fostering sustainable agricultural practices, community well-being and rural development.

Objectives: to understand the nuanced meanings attached to 'local food,' the consumption patterns and perceptions of rural residents, and the social dynamics driving local food consumption in rural areas.

Methods: Three predominately rural municipalities in Portugal were selected for empirical research. Qualitative methods including in-depth interviews, informal conversations, and participatory observations were used to understand the social dynamics enabling local food consumption. Surveys and quantitative analyses were conducted to identify consumption patterns and perceptions of local food among rural residents.

Results and Conclusions: Local food consumption in the case studies was explored by grasping rural residents' understanding about 'local food', based on their patterns and preferences for these food items, and by revealing the different pathways used to acquire local foods in these areas. Local food consumption appeared to be inconspicuous and creative. It was shown that it varies and is not limited to notions within the alternative food network literature. Instead, a dynamic interplay of consumers' notions, behaviours, and preferences toward local foods shapes up Local Food Systems in these areas.

CHAPTER 2

SMALL FAMILY FARMING AS A RURAL DEVELOPMENT PROJECT

CHAPTER 2.1

FAMILY FARMING – ISSUES AT STAKE

WHAT IS FAMILY FARMING?

The relevance of Local Food Systems in Europe today must be understood in terms of their role in rural development, especially over the sustainability of small-scale farming. As agreed by the International Steering Committee of the International Year of Family Farming in 2014, family farming: "is a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labour, including both women's and men's. The family and the farm are linked, co-evolve and combine economic, environmental, reproductive, social and cultural functions".

Within the concept of family farming, there exists significant diversity, including variations in land size, productive sectors, asset base, infrastructure access, proximity to markets, commercialisation levels, market engagement, and specialisation within household farming activities. These factors influence the strategies adopted by family farmers and impact their economic, social, and environmental outcomes in their respective regions. Despite comprising two-thirds of all European farms in terms of quantity, small farms, whether measured by physical extent or economic size, only cultivate 6.1% of the utilised agricultural area, according to Eurostat (2018). Globally, there are approximately 500 million family farms, accounting for more than 90% of all farms.

FAMILY FARMING AND FOOD SYSTEMS

Food systems are confronted with urgent challenges like hunger, diseases linked to diets, the necessity to supply a growing global population with adequate and healthy food, reducing food wastage, depleting natural resources, escalating greenhouse gas emissions, environmental degradation, and the impacts of climate change. Family farmers, including peasants, indigenous communities, traditional societies, pastoralists, fishers, and mountain farmers, possess distinctive potential to drive transformative shifts in how food is cultivated, produced, processed, and distributed, which could play a key role in enhancing regional development (FAO and IFAD, 2019).

Empowering and supporting family farms to establish diversified, inventive, and dynamic agricultural systems can enhance the accessibility of nutritious, sustainably sourced, culturally suitable food. Developing local food systems are deemed to encourage healthy eating habits and facilitate the shift toward customised, varied, robust, and sustainable food systems. Sustainable food systems built around family farms can generate fresh economic prospects and appealing employment opportunities. They also bolster rural services, complement agricultural activities, and boost rural-urban connections and collaborations through localised food supply chains. These chains hold the potential to substantially decrease food waste.

Family farmers' multifaceted roles within communities and as stewards of the environment enable the efficient and sustainable utilisation and conservation of natural resources. This encompasses practices like preserving biodiversity, averting soil erosion, preventing water pollution, and averting environmental harm. Moreover, these practices foster social integration and fairness, safeguard and transmit cultural knowledge, deliver ecosystem services, and manage landscapes effectively.

FAMILY FARMING AND RURAL DEVELOPMENT

Family Farming plays an important role in the economy of families and are a significant element in the well-being of rural communities. Besides their contribution to food security, they generate income and employment and have a positive effect in the social vitality of the countryside, the sustenance of rural landscapes and the preservation of biodiversity (Dinis, 2019). Promoting family farming may help address key challenges related to equity, poverty, and employment, as family farms can offer better opportunities for civic and social engagement, stronger connections to local culture and landscapes, and higher levels of trust among community members.

The connection between family farms and local communities and landscapes fosters a heightened interest and care for the natural environment and climate, essential for agricultural production. Family farms are more inclined to adopt sustainable practices such as agroecology, organic agriculture, and permaculture, benefiting from their intricate understanding of family labour and local ecosystems. Therefore, rural development strategies must prioritise the intergenerational transfer of natural resources, traditional knowledge, and culture in rural areas, which are integral aspects deeply embedded in family farming systems.

FAMILY FARMING IN PORTUGAL

In Portugal, the population of Family Farms in 2016 was 575,000 individuals, constituting 5.6% of the national population. However, the number of family farms decreased significantly, dropping from 20% of the resident population in 1989 to 6% in 2019 (INE, 2021). The decline is attributed to factors such as demographic reduction, an aging population's continued connection to the land, and limited economic opportunities in inland regions.

To address this decline, a Statute of Family Farming was introduced in 2018, following international efforts supporting family farming. The statute defines family farming as an organisation of production, environmental management, and social life in rural areas based on a family farm holding. Family labour, accounting for more than 50% of total farm labour, characterises a family farm holding. Two types of family farms are distinguished in Portugal nowadays: those producing for family consumption and proximity networks ("subsistence farming") and those participating in markets. Family farm labour contributes to over 2/3 of agricultural work in Portugal, but there has been an increase in salaried agricultural labour and agricultural services contracting.

Efforts to support family farming in Portugal include legislation prioritising family farms in public procurement contracts and the establishment of the Skills Centre for Family Farming and Agroecology in 2021. This centre, initiated by the Portuguese Agricultural Confederation (CNA), aims to share knowledge, enhance research, promote innovation, and qualify producers to support Family Farming and Agroecology in the country.

CHAPTER 2.2

DO SMALL FOOD BUSINESSES ENABLE SMALL FARMS TO CONNECT TO REGIONAL FOOD SYSTEMS? EVIDENCE FROM 9 EUROPEAN REGIONS[1]

ABSTRACT

For small farms across Europe, connecting to small food businesses offers a significant route to market. We analyse survey data from 85 small food businesses in nine European regions and explore the enabling and limiting conditions around this connectivity. We show how connectivity depends on context-based interrelationships among food system actors and consider the effects of these relations on small farm integration. Results show stronger connections when small food businesses are themselves farm-based. Weaker linkages are also apparent in the absence of public and social support. We argue that regional food systems can be enhanced by increasing small food businesses' capacity to source from small farms, with the added benefit of increasing the viability of these small businesses.

Keywords: small food business, small farms, food system approach, integration, localised food systems

INTRODUCTION

The industrialisation of food systems and the increased urbanisation undergone in Europe during the last century has led to transformations in the way we manage food production and relate to food consumption (Moragues-Faus et al., 2017), causing the de-territorialisation of food systems

[1] An adapted version of this chapter was published in Global Food Security as Hernández, P. A., Galli, F., Prosperi, P., Šūmane, S., Duckett, D., Almaas, H. E. (2021). "Do small food businesses enable small farms to connect to regional food systems? Evidence from 9 European regions", 29 100505. Global Food Security. Elsevier BV. https://doi.org/10.1016/j.gfs.2021.100505 (Appendix 1)

(Vasta et al., 2019) due to the concentration of control in the agrofood sector (IPES-Food, 2016) and the fragmentation of social relationships (Mourato et al., 2018). Support for small farmers has been debated as key to restore food systems and promote rural sustainability (Fanzo, 2018; Galli et al., 2018; Reina-Usuga et al., 2018) through the promotion of sustainable, innovative and competitive farming systems (Khalil et al., 2017; Randelli and Rocchi, 2017; Tribaldos et al., 2018) and small producers increased integration in short food supply chain (SFSC) initiatives, such as localised and alternative food systems (Brinkley, 2018; Lamine et al., 2019).

It has been widely documented that SFSC can help reduce the vulnerabilities of local food systems by activating endogenous resources and promoting regional embeddedness (Yacamán Ochoa et al., 2020), with processing as a crucial link enabling producers to transform food surpluses (Yacamán Ochoa et al., 2019). SFSC are catalysts of initiatives in food systems based on principles of proximity and trust-based relationships, often described as chains with no more than one intermediary (Chiffoleau et al., 2016) and defined according to a context-based geographical distance between producer and consumer (Kebir and Torre, 2020).

Small food businesses (SFB) can be important actors in SFSC, as they can help re-territorialise food by "capitalising on the many advantages small food producers have over the industrial food system, including freshness, variety, [provenance], and transparency on how the food was produced and the opportunity to develop social bonds with their customers" through innovative interactions (e.g. new outlets, new forms of relationships and place-based initiatives, etc.) (Halweil, 2004). SFB, in our study, refer to enterprises carrying out activities related to any stage of production, processing and distribution of food; establishing a buyer-supplier relationship with the regional small farms (Grando et al., 2019); that are locally owned (the capital remains in the region); and, which use key

foodstuffs in the territory. 'Small' relates to their size as regards economic features and labour (on average, no more than five non-family paid employees in all sampled SFB).

However, the capacity SFB might have to embed small farm products in local food systems is still to be scrutinised. The outcomes from SFB-small farm dynamics depend on a number of conditions (e.g., small producers' capabilities, market and political infrastructures, and other factors) that are context-based (Böhme et al., 2008). Several micro-environmental factors also affect SFB's relative competitiveness to work in collaboration with small producers, such as logistics and supply, which are inherently linked to the businesses' small-scale retailing capacity (McKeever et al., 2014) and the issues in the scaling up of SFSC (Connelly and Beckie, 2016; Yacamán Ochoa et al., 2019).

Aiming to explore the capacity of SFB to integrate small farms in food systems, our paper operationalises the proposed theoretical analysis model by Corrêa et al. (Corrêa et al., 2020) situated in entrepreneurial studies (Figure 2). It uses empirically-collected data of 85 selected SFB in nine European regions part of the Horizon 2020 SALSA Project – *Small Farms, Small Food Businesses and Sustainable Food and Nutrition Security* (2016-2020). Our study focuses on the micro-environmental elements ('externalities') characterising SFB's integration into the food system, from a relational perspective, and less on the internal specificities determining each enterprise's behaviour. It aims to expand understanding of structural relations affecting the small businesses environment. Its objective is to identify *what the relevant food system interrelations enhancing or hindering SFB's capacity to integrate small farms in food systems are.*

The next section is structured in five parts. It first sets the conceptual approach to explore our research object and ground the methodology. Then, it describes the methodology used for data collection and analysis. Section 4 includes our empirically-grounded results, followed by the discussion of our findings. Last, we present our conclusions.

CONCEPTUAL SCOPE

We adopt a food systems approach to discover the relational elements determining SFB's behaviour in the regional food system (Ingram, 2011). We understand food systems as "complex multilevel networks of actors (and related activities) embedded in intricate socio-economic, political and ecological relationships that shape their outcomes across different geographies and social groups" (Moragues-Faus et al., 2017). We embrace the definition of territorialised agro-food systems suggested by Rastoin (Rastoin, 2015) to look at the complex dynamics circumscribed in each EU rural region (NUTS3) examined, placing them in what we call regional food systems: the "set of agri-food sectors localised in a regional geographic space and coordinated by territorial governance". We analyse SFB-small farm linkages in the context of food system activities (production, processing, distribution and consumption) and interactions with other actors and elements (Ericksen et al., 2012).

The model proposed by Corrêa et al. (Corrêa et al., 2020) is used to comprehend how the development of SFB can affect the integration ('embeddedness' in Granovetter's terms) of small farms into the regional food system. Local embeddedness is a conceptual approach used in rural entrepreneurship studies to examine the nature, depth and extent of entrepreneurs' social and local ties within their rural contexts (Pato and Teixeira, 2016). We look specifically at SFB collaborations with regional small farms in our food system analysis, understanding that "entrepreneurship is embedded, submerged and absorbed in fluid networks of individual relationships and economic objectives that go conjointly with non-economic ones according to each social context (McKeever et al., 2014). Its adequateness to our research is manifold: first, it presumes entrepreneurs' decisions are the combination of multiple relational and context-based (territorial) factors, going beyond a

merely rational choice approach; second, it captures the integration of entrepreneurs into relational structures or systems from a holistic perspective that blends society, culture and economy; and third, it considers two non-economic processes, redistribution and reciprocity, as social behaviours coexisting alongside market behaviours.

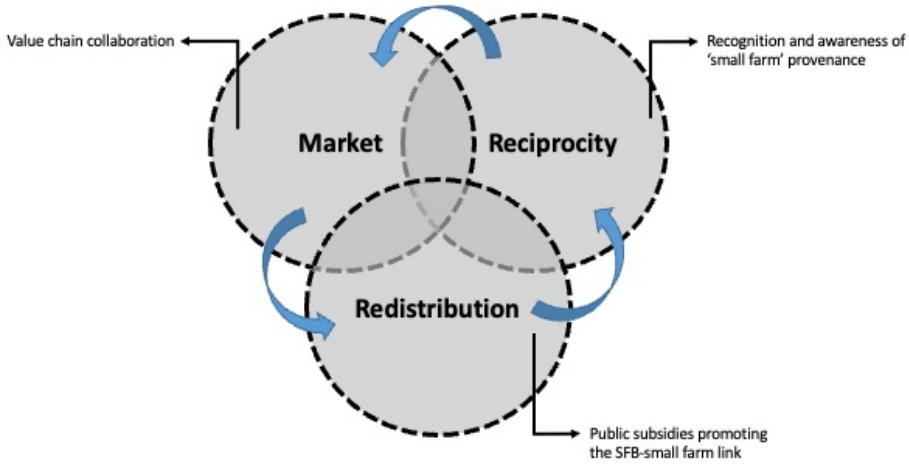

Figure 2. The three structures determining the capacity of small food businesses to integrate small farms in regional food systems. Adapted from the proposed theoretical analysis model of Corrêa et al., 2020. (Own elaboration)

Our analytical model represents entrepreneurs, hereby SFB, as adaptive actors in multi-faceted interrelations that contain various values, norms and institutions across three interrelated structures: market, redistribution and reciprocity, while "creating network structures as a result of self-seeking actions by focal nodes and their connections" (Ahuja et al. (2012) cited in *ibid.*:233). It encompasses systematic context-based specificities affecting SFBs' trajectories in food systems. In our analysis, these 3 structures are non-hierarchical, work in interdependence with each other, and are understood as:

1) *Market structures* include all market-related rationalities impacting SFB-small farms interactions. They depend on the value chain actors operate in, but also on multi-level market pressures defining the rules of supply and demand (e.g., concentration of value chains), as well as businesses' distribution and marketing strategies (Armendariz et al., 2015). Here, we include the multifunctional dimension of small farms activities (Renting et al., 2008), such are diversified value chains, and all factors responding to the market limitations within a specific food system.

2) Reciprocity considers the reciprocal giving of material or immaterial goods to one another, by virtue of values and norms that aim at maintaining social ties (e.g., families, clan, friendship, communities, associations, etc.) (Corrêa et al., 2020:233). We pay particular attention to *reciprocity structures* (both formal and informal) among food system actors that promote collaboration between SFB-small producers. Collective arrangements, such as small farmers' associations and complementary food networks (e.g., purchasing groups), plus cultural norms like food habits and consumer demands, have the capacity to prompt closer links between SFB with regional small farm producers, prioritising collective welfare and social stability (Marshall et al., 2018).

3) Redistribution assumes processes and measures (whether local, national or supranational) prescribing that members of a collectivity make contributions (i.e., in the form of taxes, goods or services) to a central agency with the responsibility to allocate these contributions to a shared interest of the collectivity (Corrêa et al., 2020:233). *Redistribution structures* include centralised norms or values that can play a facilitating and/or discouraging role in the promotion of the SFB-small farm link (IPES-Food, 2016); for instance, through the allocation of public support via national and European funding mechanisms. Financial support through the EU Common Agricultural Policy

(CAP), Rural Development Programmes (RDP) (i.e., on-farm processing), land support, etc. belong in this category.

Three core questions foster our research and guide our discussion: *(i) how feasible is it for SFB to procure raw materials from small farms*?; *ii) what is the relevance of 'small farm' provenance branding vis-à-vis other labels such are 'local' or 'artisanal' in terms of consumer perceptions and SFB marketing strategies?; and iii) what is the support small farms have to get into processing and enter into SFSC as small food businesses*?

METHODOLOGY

DATA COLLECTION

The empirical foundation for our study is data collected in 2016-2018 from 85 purposely selected SFB in nine NUTS3 European regions (Appendix 1): Alentejo Central - PT183, and Oeste - PT16B (Portugal), Lucca - ITI12, and Pisa - ITI17 (Italy), Latgale - LV005, and Pieriga - LV007 (Latvia), Hedmark - NO021 (Norway), East Scotland/Perth and Kinross, and Stirling - UKM27 (ESc), and West Scotland/Lochaber, Skye and Lochalsh, Arran and Cumbrae, Argyll and Bute - UKM63 (WSc) (United Kingdom). Whilst not statistically representative, they aim to show the diverse connections that SFB can establish with small farms in different food systems across the continent. Moreover, European rural regions have a longstanding history of maintaining strong links with food systems (Pinto-Correia et al., 2018). Small food businesses were selected according to the SALSA criteria (Rivera et al., 2019). Each SFB had to: be linked to one of four key food products studied in each region; source at least one of its raw food products from small farms; have on average no more than five non-family paid

employees; and, be locally owned (specifically, the capital remains in the region). Approximately nine SFB were sampled per case study. The selected SFB ranged from food processors, to food retailers and to food service businesses (HoReCa industry - Hotels, Restaurants and Catering).

Our sample includes SFB with diversified activities (e.g., wine-making, cheese production, baking, agro-tourism, selling of foodstuffs, etc.). The main value-adding activity reported was processing (40% of the sample), followed by distribution (34%), although with great variations across the regions (Table 1). SFB carrying out processing activities transformed raw foods, which could be produced on-farm or purchased from other suppliers, into processed products such as olive oil, wine, fermented foods, cured meats, fruit jams, etc. Lucca, Pisa and Hedmark included the larger number of processing SFB; whereas Oeste, ESc and WSc presented a greater number of SFB involved in distribution activities of products like fruits and meals. In this study, we refer to small farms that transform their own products and sell them in processed through various commercialisation channels form as “farm-based SFB”.

Table 1. Characterisation of Small Food Businesses in the sample, according to their main adding-value activity.

SFB main activity	NUTS 3 regions									Total
	Alentejo Central (PT)	Oeste (PT)	Lucca (IT)	Pisa (IT)	Latgale (LV)	Pieriga (LV)	Hedmark (NO)	Esc (UK)	WSc (UK)	
Production	2	2	2	1	3	3	0	2	1	16
Processing	2	4	5	6	3	5	7	0	1	33
Distribution	1	7	1	4	2	1	3	5	4	28
Other	0	0	0	1	3	0	1	2	1	8
Total SFB	5	13	8	12	11	9	11	9	7	85

Various data sources inform our analysis: i) A common, structured questionnaire addressed to SFB on SFB’s demographics, activity, labour and income, market relations, governance issues, and

perceptions and future perspectives (Appendix 2); ii) specific questions about SFB done through interviews to regional small farms in a separate interview survey (Appendix 3); and, iii) subsections of the Food System Regional Report (Appendix 4) reporting the validation of data collected in each region through individual interviews to key informants and participatory methods with actors across the sector (four focus groups and one regional workshop, both per region). A key aim of these mixed-source methods was to capture the different profiles of SFB, as well as to identify their relevant opportunities and challenges at the regional food system's scale. Appendix 5 shows the scope and number of participants in our collection methods.

DATA ANALYSIS

Data analysis started with qualitative/semantic analysis (Corbin and Strauss, 2008) of the data sources, building a list of key issues per region regarding SFB's development. The list of key topics from all regions were compared and synthesised into five variables. From the SFB questionnaire, we selected data sets supporting our assumptions for each variable, which later were validated with the reports. SFB_Q21,22,28 were analysed quantitatively; whereas two variables required a mixed-methods analysis. For Question 6 (SFB_Q6) '*What activities do you carry out?'*, we merged similar activities and coded them in four categories, adapting Ericksen's (Ericksen, 2008) four food system processes (1 – production (baking and cooking); 2 – processing (refining and processing); 3 – distribution (retailing and marketing); and 4 – other (activities not fitting in categories 1,2, or 3). Instead of using consumption as our fourth category, like Ericksen proposes, we kept 'other' as in-vivo code, for consumption does not apply as a business activity and data reveals a wide range of uncategorised activities. Questions 19 and 20 (SFB_Q19) '*What are your raw materials?'* (list and

number of products) and (SBF_Q20) '*Who supplies your raw materials?'* were analysed in two ways (Appendix 6). The first one considered each SFB individually, thus producing 85 data values. Entries mentioning 'local and regional small farms' or 'own produce' under SFB_Q20 for core products only were labelled Y – yes (indicating a direct connection with small farms, or zero intermediaries between SFB-small farms); while the rest were labelled N – no (indexing an indirect connection with small farms, or one or more intermediaries between SFB-small farms). The second method looked at all the suppliers provided in all responses – a total of 143, because SFB often provided more than one supplier per item. All suppliers were later codified into 6 categories (self, farm in region, local processor/coop, retailer/supermarket, farm outside region, wholesaler) using qualitative analysis.

RESULTS

In our data, we found three interrelated aspects impacting SFB's capacity to integrate small farms in food systems: value chain collaboration, lack of branding for small farm foodstuffs, and limited public support. They indicate the particular set of relationships affecting the trajectory of these businesses. All variables inform about the various partners along the value chain and what sort of processes SFB (may or may not) engage in.

VALUE CHAIN COLLABORATION

According to our results, SFB confirmed they procured raw food materials from multiple suppliers and reported that raw material procurement makes part of the business strategy to ensure economic viability and satisfy consumer demand, considering aspects such as purchasing price,

quantity volumes and continuity of supply, etc. However, it is noteworthy to say that the capacity of SFB to integrate small farms in food systems depended on whether the SFB was farm-based or not. Our data confirmed 'self' as the most dominant supplier in sample (28%), representing SFB that were farm-based. Next suppliers in line were "retailer/supermarket" (23%), which could be from inside and outside the region, and "farm in region" (21%), including all farm sizes small, medium, and large. Figure 3 shows the different suppliers SBF reported to use.

If SFB were farm-based, diversification of activities and use of non-conventional market channels (e.g., SFSC) showed across our case studies to enhance participation of small farms in secured markets. Multi-functional farming included agro-tourism activities, common in Lucca, Pisa, and Alentejo Central, which have fostered local and traditional food production and transformation techniques (i.e., micro-processing technologies) to cope with seasonality and expand product availability. Farm-based SFB interested in reaching to proximity consumers also confirmed participation in SFSC. A growing niche identified in the Latvian dairy sector was represented by small dairy farmers, who strengthen their market access and position by on-farm small-scale processing and production of various kinds of artisanal dairy products. On many occasions they market these products through their own or less conventional channels (e.g. on-farm shop, farmers' markets).

Interaction of small farms with SFB was also detected in the horticulture sector through SFSC with contracts relying on proximity and a good customer-producer relationship [Esc, WSc, Hedmark]. One example is a horticultural enterprise on the Isle of Arran [WSc] producing herbs and specialised vegetables which intermittently had contracts with local restaurants within a few kilometres. This farmer/business owner preferred to operate a seasonal catering business at festivals and pop-up restaurants via direct marketing. Small farms and SFB [Pieriga] collaborated through common marketing initiatives, primarily at farmers' markets, but could take other forms such as direct

purchasing groups, online direct selling platforms, or local artisanal cooperatives. Although such business models are small producer-friendly, they can also be volatile. For instance, the Stirling Food Assembly (Esc) ceased trading in 2017 and participants on the Isle of Bute and the Isle of Skye (both in WSc) complained that farmers' market organisation was inconsistent and often relied on volunteers. Our data also confirmed that small-producers' cooperatives can facilitate SFB access to small farm products [Oeste, Alentejo Central]. Such specialised cooperatives collect raw materials from various small farms year-round thanks to their effective storage facilities (e.g., pear, wine, olive oil) and supplies the market continuously. SFB using this channel argued that it simplifies logistics by putting all outputs – mostly fruits and horticulture – collectively into a common pool that can better meet the demands of a competitive market.

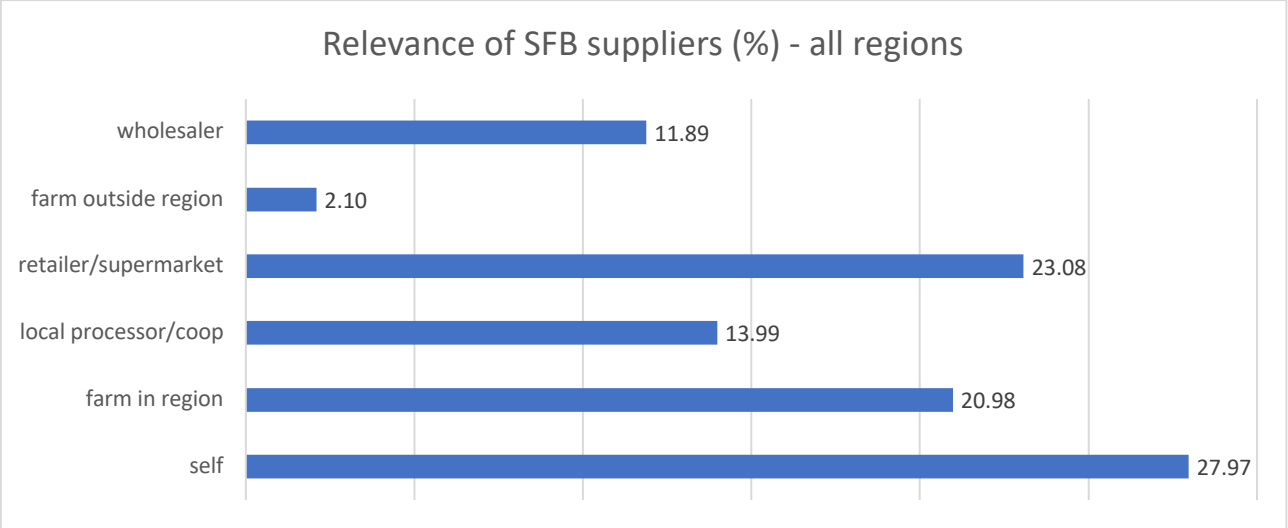

Figure 3. Reported suppliers by all sampled Small Food Businesses. (Own elaboration). Note: farm in region includes small, medium, and large farms.

On the other hand, the connection between small farms and SFB in terms of "suppliers – buyers" was vastly common in our sample. SFB often said they preferred to buy products from wholesalers and larger farms that can ensure regular supplies. Additionally, in cases where small farms marketed their products indirectly, i.e., through other market intermediaries, SFB were usually

not among them. For instance, a dairy farmer [Pieriga] indicated that the disappearance of smaller shops in the region has limited available market outlets for local small farmers.

In general, SFB found it easier to procure raw materials from other suppliers beside small farms, because of lower transaction costs (single order, traceability, less paperwork) or to guarantee steady supplies. Similarly, SFB did not source from small farms because many small producers preferred to market through conventional channels and not sell to smaller buyers. In the Scottish regions and Latgale, connections were generally weaker for off-farm SFB. Farm produce shops in Esc and Hedmark reported they preferred continuity of supply and volumes that are difficult for small producers to fulfil, procuring instead from bigger farms and wholesalers. Figure 4 shows the distribution of suppliers declared by SFB across the studied regions.

However, regulations on food production and distribution were cited by some business owners as risk factors that hamper the planning and development of SFB. Processing businesses (i.e., abattoirs and creameries), it was argued, are more likely to take produce from small farms, however these businesses are generally not “small” [Scottish regions, Hedmark]. Food safety regulations (food handling, traceability of food, food labels, etc.) were also claimed an issue [Alentejo Central, Lucca, Pisa]. In particular, administrative and food safety requirements were deemed “bureaucratic and burdensome procedures” that can hinder the viability of SFB (e.g., traditional production of *talha* wine – an example of retro-innovation of homemade wine made with traditional processing techniques [Alentejo Central]). As a result, SFB stated they must sometimes source from non-small farms to comply with such rules to attain their business goals.

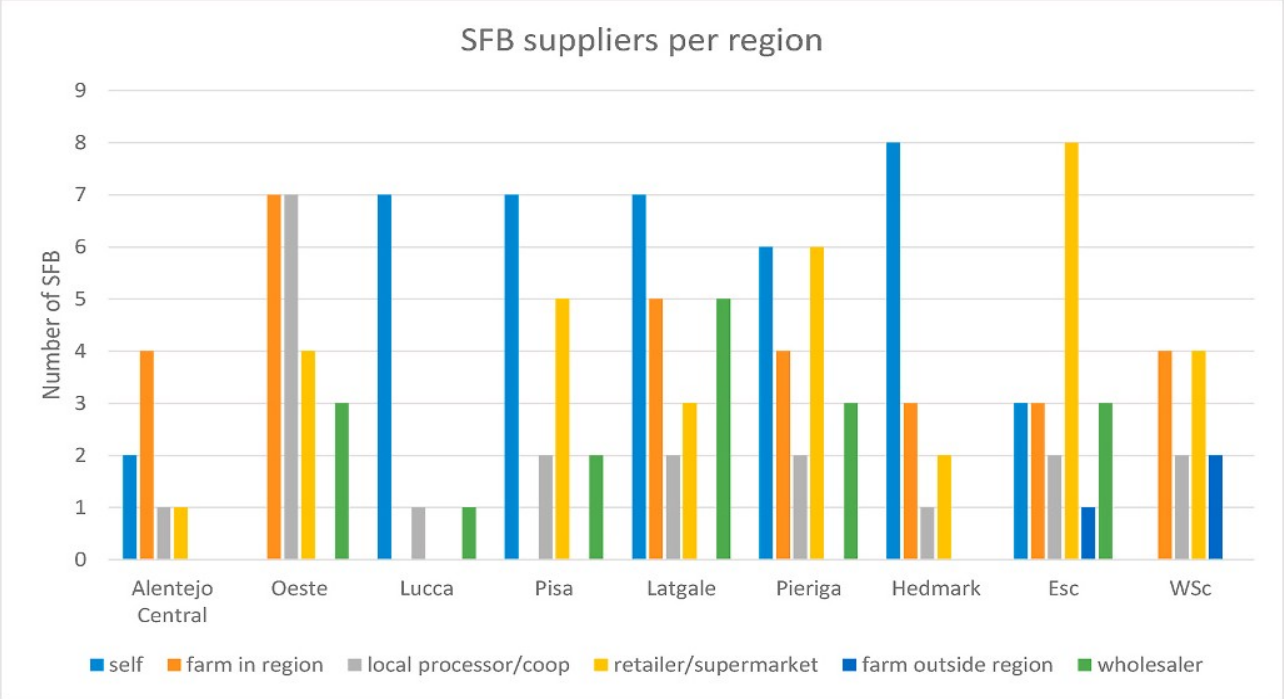

Figure 4. Distribution of suppliers declared by Small Food Businesses across the studied regions. (Own elaboration)

LACK OF BRANDING FOR PRODUCTS FROM SMALL FARMS

From our sample we learned that no brand or label exists that identifies products produced by small farms in the market. Instead, official certification and labelling schemes were argued to be used by SFB to give added-value to products, reconnect consumers with producers (including via SFB), and tell a story behind each product (e.g. where, how and by whom it was grown/raised). SFB reported national and international schemes on specific production methods (e.g. organic, integrated production, GlobalG.A.L.P., Tesco Nurture), food quality (e.g. Local Food Quality Assessment and KsL [Hedmark]), geographic provenance (e.g. PDO and PGI, slow food) and cultural heritage (e.g. artisanal products, Culinary Heritage Movement and European Culinary Centre [Latgale]). Similarly, labels promoting “local”, “fresh” and “traditional” products were informally employed to attract consumers and tourists.

Nearly sixty percent of the total businesses sampled (50 out of 85) declared non-participation in any certification or labelling scheme. Justifications for this behaviour included the lack of incentives and the bureaucratic burden. For example, in Latvia, certifications (i.e., organic, artisanal production) and marketing authorisations were held to be complicated and expensive to comply with and the controlling bodies criticised as too restrictive. In Lucca, none of the sampled SFB participated in any certification or labelling scheme. Figure 5 shows the number of SFB participating in certification or labelling schemes across the regions. Procuring from small farms did not appear to be a strong unique selling point (USP) for farm shops in Scotland to leverage either. Uncompetitive prices when compared to large scale operations were also a reason for some SFB to opt for other (and cheaper) raw material sources and skip any branding strategy. In Portugal, a lack of consumer demand for small farm products was said to undermine the viability of SFB using products from small farms: “Lamb meat is looked down upon by younger consumers, who would rather consume beef or pork produced outside their region”, as mentioned in one focus group. In Alentejo Central, niche products were also said to resonate more with tourists, who were credited with greater purchasing power, will and curiosity to pay for added-value products. A business owner in Latgale argued a certification held in the past provided no added-value to the business either.

PUBLIC SUPPORT

For subsidies, we refer to the financial public support that SFB can take advantage of to invest in their activities. In our case studies, less than half of the SFB received any type of subsidies (45%), with great variation across regions. Our data informed us than less than half of the sampled SFB reported support through public funds (Figure 6). The main identified limitations were the absence

of support for SFB to apply for such subsidies, and/or specific funding for SFB that do not carry on-farm activities.

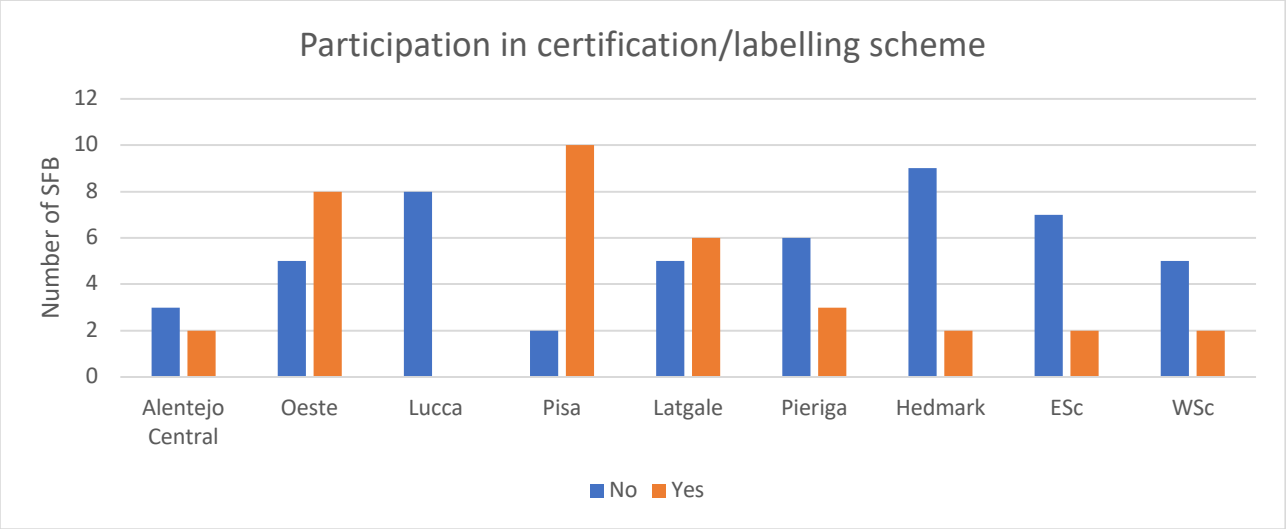

Figure 5. Reported use of certification or labelling schemes by all sampled Small Food Businesses. (Own elaboration)

Data from the two Italian regions hint that subsidies for SFB are mostly agriculture-driven and derive mostly from the EU Common Agricultural Policy, Rural Development Programme (RDP) and Common Market Organisation frameworks. This public financial support included single area payments, subsidies for organic agriculture, tax exemption for fuel, and others. Regional governments can also implement laws at a regional level promoting diverse and multifunctional activities by small farmers [Lucca and Pisa] (e.g., on processing and conditioning of on-farm products, Tuscany Region, 2018). This law aims to make processing and sale of local and on-farm products easier and more flexible (e.g., considering local and seasonal ingredients, farmers are allowed to process food in their kitchen if respecting food safety requirements). The support programme for the development of small-scale food processing was said to foster the emergence of many small businesses in the Latvian and Italian regions, through grants that help SFB acquire equipment or

build processing facilities. Promotion of SFB in Latgale was said to take place through various means (i.e. a culinary heritage movement, rural tourism activities, LEADER projects, cultural events such as town festivals, traditional celebrations, and food and tourism fairs).

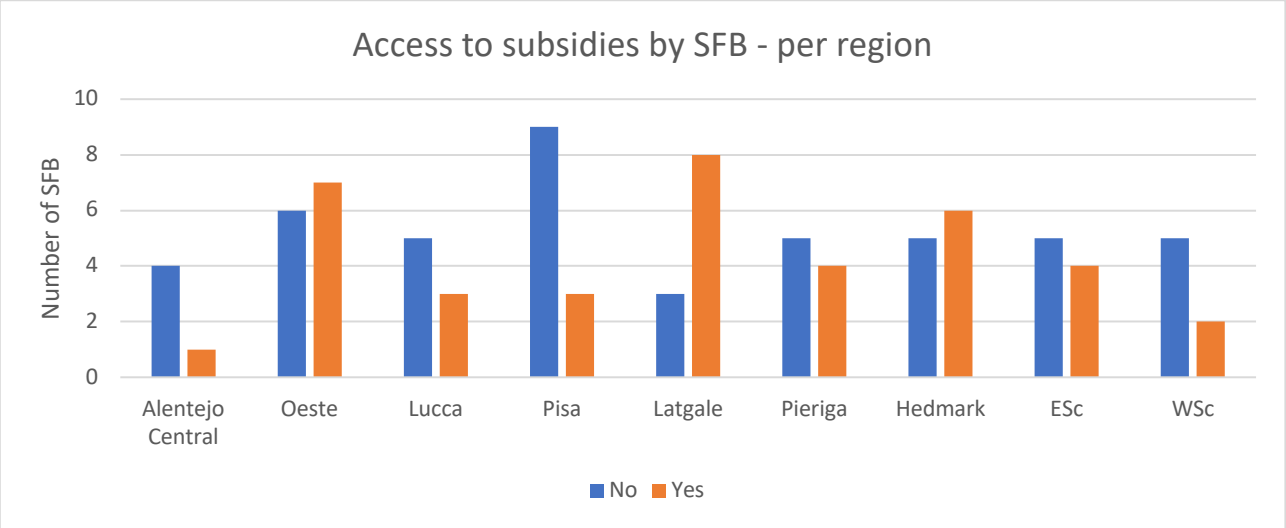

Figure 6. Number of Small Food Businesses receiving public subsidies by region. (Own elaboration)

One SFB producing wine liquor [Oeste] stressed the important support from the RDP to help launch the business idea, upgrade buildings and equipment, and make investments.

In Norway, a national policy designated for the development of SFB has been in effect for the past 20 years, strengthening SFB's position in the value chain (e.g., SFB could apply for innovation/seed funding (e.g., business start-ups). Most businesses sampled in Hedmark expressed satisfaction with governmental regulations and believed them to be fair, as well as important for their businesses' credibility. On the one hand, SFB owners were pleased with the food safety authorities from which they received advice, legal information, and training on how to establish and run a SFB, increasing their entrepreneurial skills. On the other hand, food businesses in Norway can benefit from positive discrimination through the exemption of registration or approval by the

national food safety authorities, as long as they: (i) deliver products directly to consumers, (ii) distribute products in the local market (within 100 km), (iii) deliver up to 600 kg of produce per week, or (iv) do not sell animal products ("Mattilsynet. Lokalmat – registrering og godkjenning," 2018).

In contrast, many small farmers interviewed in Pieriga expressed willingness to develop some kind of on-farm processing, but claimed not having the necessary resources (funding, facilities, knowledge) to implement these plans. In Alentejo Central, non-farm based SFB (e.g. agro-tourism, meal preparation, and agricultural machinery rental) reported difficulties in receiving public subsidies. In Alentejo Central and the Scottish regions, support was said to be tailored mostly for large-scale operations.

DISCUSSION

This section explores transversally the existing interrelations between SFB and regional small farms in our case studies. The SFB-small farm link varied across our data, reflecting the different abilities SFB have to choose their activities and partners, based on the possibilities and resources available, plus their capacity and skills to turn those resources into entrepreneurial opportunities (Steiner and Atterton, 2015). The discussion below is guided by the three sets of behavioural structures (market, reciprocity and redistribution, Table 2) and examines the structures where this link might be challenged and the relationships that can be fostered to enhance the integration of small farms in regional food systems, and, thus, increase SFB development.

INTEGRATION THROUGH MARKET RELATIONS

We assessed the integration of small farms in the regional food system in terms of their behaviour in the value chain, which refers to the context-bound networks of [food system] actors that "exchange goods, financing, and information, as well as collaborate in the medium and long terms" (Monastyrnaya et al., 2017). This form of integration enabled us to understand *how feasible is it for SFB to procure raw materials from small farms*?

The analysis from our results index that the SFB-small farm link depends on whether the SFB is grounded on farming activities or not. If the business is off-farm, results showed that raw materials are mostly purchased by any supplier, except small farms. Two main issues might help explain the limitations for small farm products to remain in the local market, and/or be purchased by SFB: small farms cannot secure the SFB market because they cannot compete against the volume and price offered from less expensive suppliers, such as wholesalers and large farms. On the other hand, small farms are likely transforming the product and bringing it directly to the market via SFSC, increasing the value of these products to which SFB cannot access.

As shown in section 4, SFB who do not produce their own raw material must source them from the most economically viable channel in the market. This phenomenon responds to current trends due to the de-territorialisation of food systems, stimulated by the concentration of power in food systems due to the vertical control of food processes in a handful of actors setting the rules of food production and distribution (IPES Food, 2017). On the one hand, a strategy for small farms to remain viable is by entering SFSC, because these have forged "new value chains" with redesigned set of codes, practices, and rules to help overcome any competitive disadvantages in terms of demand and marketability of small farm products (Roep and Wiskerke, 2013). Against this backdrop, SFB are

unlikely to purchase their raw materials via SFSC, not only due to increased costs but also because this would add one more intermediary between producer-consumer, which is the opposite of what SFSC stands for (Chiffoleau et al., 2016).

Table 2. Challenges and opportunities to enhance small farm embeddedness in regional food systems, according to the three forms of integration.

Form of integration	Challenges	Opportunities
Market	- Raw materials outsourcing - Regulatory barriers ▪ food production (e.g. food safety) ▪ food distribution (e.g. logistics)	- Promote innovative value chains for small farms (e.g. SFSC and small producers' cooperatives to scale-up SFSC)
Reciprocity	- Lack of brands that identify products from small farms - Consumers' perceptions about small food products	- Create labelling schemes identifying small farm produce - Increase consumers' awareness on small farm foods
Redistribution	- Limited public funds	- Improve financial support oriented for SFB that do not carry on-farm activities - Promote positive discrimination for SFB in public governance frameworks

SFB are likely to purchase from actors capable of guaranteeing a steady flow of affordable products, due to their weakened bargaining capacity in food systems (Yacamán Ochoa et al., 2019). Large processors – who are often better geared for interacting with large producers – also represent a viable source for SFB, because the former is often better suited to make investments in basic processing such as washing, grading or packing, and can also devote more resources to customer relationship management. Large processors in the UK, for example, tend to be centralised and have consolidated over recent decades (e.g., slaughterhouses and creameries), creating logistical challenges and adding transportation cost to small farms' operations (Kennard and Young, 2018).

INTEGRATION THROUGH RELATIONS BASED ON RECIPROCITY.

We see the integration of small farms in terms of the functioning reciprocity structures (both formal and informal) discovered across our cases, which hint at the forms of collaboration between SFB-small producers. Based upon our findings, we argue that SFB marketing strategies and consumer perceptions play a key role in understanding *what is the relevance of 'small farm' provenance branding vis-à-vis other labels such are 'local' or 'artisanal'?*

Our results confirmed that foodstuffs produced by small farms are not identified with a brand or label that differentiates them, but which could potentially increase their positioning in the market. Two interrelated reasons might help explain this. First, the large array of brands identifying food products (e.g., geographical denomination, production methods, trade conditions, healthy diets, etc.) might be signalling mixed signals to consumers, while negatively affecting their purchasing choices (Watts et al., 2018). Second, little effort (public or private) has been made to increase consumers awareness about the socio-economic and environmental benefits of supporting local foods produced by small farms. These tendencies might limit the capacity of SFB to expand their activities by actively promoting small-scale farm products.

The role of consumers In creating, designing, and impacting alternative food networks has strengthened in the last decades (Randelli and Rocchi, 2017); although not homogeneously. Labelling and certification schemes nowadays in Europe emphasise on origin, quality, tradition, history and are related to a territory (Delicato et al., 2019; Giampietri et al., 2016); however, all of these brands remain mostly niche-centred. This phenomenon has in fact brought about the reconnection of some consumers to the food source, while disregarding issues on food production scale and food affordability. The main problem is that although products are labelled 'local' or

'artisanal', and apparently index they are locally-sourced, small manufacturers – as shown in our results – increasingly import raw materials from outside the region or purchase from large-scale suppliers offering affordable prices, while relying on local industries and services (Avermaete et al., 2004), but still selling them as 'local'. This aspect is not only misleading but also discouraging for local consumption by residents in the area, who might recognise whether, or not, food is in season or appropriate for the territory and lose trust in such labels. On the other hand, well-off consumers (e.g., tourists), to whom most of these certified products are targeted due to their higher purchasing capacity (Balogh et al., 2016), find themselves misinformed while supporting products derived from conventional farming, which are often produced by medium and large operations.

Additionally, the increased popularity in Europe of multiple certification labels and brands are conflicting with each other in hybrid food systems that foster the dis-embedding of food systems, while leading to consumers' confusion. This is the case of in-house certification schemes created by large retailers (e.g., hyper- and supermarkets) for 'local' or 'regional' food, which have blurred the boundaries between conventional and alternative supply chains (Bui et al., 2019) and put aside the ethical premises of SFSC. This behaviour could be hindering the capacity of SFB to capture the 'local market' by selling higher quality and specialised products from small farms (Meyerding et al., 2019).

The lack of a clear label identifying and promoting products from small farms is proportionate with consumer awareness and familiarity about the role of small farms in promoting sustainable food systems, which often is facilitated by SFSC. As results confirmed, consumer perceptions about the quality of food produced by small farms depend on whether products are marketed through SFSC or not, as short distance chains (e.g., farmers markets) have a closer and more direct link, where producers work closely with consumers and awareness raising campaigns often take place (Giampietri et al., 2016).

INTEGRATION FACILITATED BY RELATIONS PROMOTING REDISTRIBUTION

The decision for small farms and SFB to engage collaboratively requires mobilising new strategic alliances (e.g., establishing new relationships with food system actors) and building a strong support network of societal organisations, interest groups (e.g., consumers) and governmental authorities (Esparcia, 2014). In light of this, we consider the processes and governance forms facilitating the allocation of public contributions towards SFB development, to respond *what is the support small farms have to get into processing and enter into SFSC as small food businesses*?

Our results inform that the main identified limitations for SFB to scale up their activities were the lack of support for SFB to apply for such subsidies, and the fact no specific funding for non-farm SFB. A lack of supporting mechanisms for these businesses proofed to hinder their development, as shown in section 4.3, since having access to financial support was deemed essential for SFB to overcome the economic constraints of small entrepreneurs, especially to establish a logistical infrastructure to market their products adequately (e.g., processing equipment, storage conditions, distribution points, etc.) (Rucabado-Palomar and Cuéllar-Padilla, 2018). As confirmed in our results, application to public subsidies can be a complicated endeavour, often with technical language requiring a literacy level to meet the application requirements adequately. Having technical support and advice in subsidy application (e.g., what kind of programme measures their activities can be funded through) was shown to pay off in Hedmark, where a national framework is enhancing the economic sustainability of SFB with the promotion of SFSC.

On the other hand, the fact that most public subsidies are targeted for farm-based SFB (interested in) carrying out activities like on-farm processing and agro-tourism shows the limited scope of the frameworks, and hints at the need to redefine the wide spectrum of SFB. For instance,

businesses in catering, retailing and distribution activities can play a very essential role in the integration of small farms in food systems, yet they do not fall under this umbrella. These off-farm SFB can be a pathway for small farm products, and thus enhance local food systems.

Our data confirmed that SFB can help small farms recover their bargaining capacity in a fragmented food system by participating in SFSC and/or by collaborating with small producers' cooperatives, as these two forms of interrelationships encourage actors to cooperate in 'alternative', local, and direct food initiatives that are crucial for the local economy, communities, and also sustainable food systems (Brunori et al., 2016). SFSC can offer unconventional market spaces and relationships where SFB can be better positioned in the food system (Roep and Wiskerke, 2013), granting small farms with the flexibility of selling conveniently from the farm shop or road stand, plus giving them control over price and the possibility of selling ad hoc (Mundler and Laughrea, 2016).

Cooperative SFSC (including producers' associations/cooperatives and 'food hubs') are another way to increase integration of small farms in regional food systems, as revealed in our results. Producers' cooperatives promote technological collaboration and support collective processes (e.g., production planning, storage, logistics, distribution, and marketing, etc.) that can enhance the efficiency, viability, and competitiveness of small-scale producers (Yacamán Ochoa et al., 2019). These initiatives help with the scaling up of SFSC in places where there is increased demand for local foods, thus the need to satisfy in large volumes. To avoid opting for conventional food production that de-territorialise local food systems, the role of the public administration is essential in supporting small farms and SFSC. For instance, by promoting public procurement contracts via SFSC in school canteens, hospitals, etc. (*ibid.*).

CONCLUSIONS

Our study adopted a food system approach to further knowledge in entrepreneurial studies, by exploring the interrelations influencing SFB's behaviour in food systems, in terms of recognizing their capacity to be embedded in regional food systems. Three key aspects were found in our case studies to determine the capacity of SFB to link small farms to food systems (value chain collaboration, product branding, and public support). These areas hinted at key nodes of interrelations between SFB and other food system actors that shape the specific set of values, norms and institutions promoting or hindering small farms integration in the food system through SFB. The degree of integration that SFB enable for small farms in regional food systems was discussed in terms of three behavioural structures: market, reciprocity, and redistribution.

We recognise our evidence stems from a selected fraction of businesses and sectors, serving mainly to hint at behavioural trends. We discovered in general SFB are more closely connected to small farms when they are farm-based, for small farms act also as in-house product suppliers and due to agriculture-driven supporting frameworks for SFB. A lesser connection was evident when SFB positioning in the food value chain is weak, whether because of their inability to enter secure markets that can help add value to their activities and products, the absence of a brand identifying 'small farm' products, or due to a lack of financial or social support. Ways to circumvent SFB limitations were found to be the promotion of SFSC, deployment of clear added-value labelling schemes, and support through public governance frameworks like the EU Farm-to-Fork programme.

Further studies on SFB marketing strategies could deepen knowledge about the entrepreneurial decisions behind SFB, enlightening about the motivations and drivers of participation in certification schemes and SFSC. Assessment tools could be benefited from more

empirical case studies to examine the various structures affecting integration of small farms in regional food systems via and SFB, and, thus, inform policy makers about the steps needed to re-territorialise food systems.

CHAPTER 3

THE ROLE OF LOCAL FOOD NETWORKS IN PROMOTING SMALL FAMILY FARMING

CHAPTER 3.1

SITUATING THE RESEARCH OBJECT: PORTUGAL

Portugal is a country located in southern Europe on the Iberian Peninsula. The territory comprises 92 225,64 km^2 and borders to the east and north with Spain and the Atlantic Ocean to the west and south. Despite not having direct access to the Mediterranean Sea, Portugal is often referred to as a Mediterranean country due to its mild winter temperatures, dry summers, and precipitation concentrated in Autumn and Spring. Portugal is also known for its privileged location at Europe's entry point, with two insular regions off the Atlantic Ocean, the archipelagos of Azores and Madeira, and a century-long trading relationship with former maritime colonies in Africa, Asia, and the Americas. Mainland Portugal, which is the territory connected by land to Europe, is characterised by medium and low mountain ranges in the northern part of the country, gentle hills and plains in the south, a large proportion of land covered with forest in the central and northern parts, large scale silvo-pastoral and poor permanent pasture landscapes in the south, and long sandy beaches along the coast.

In terms of its economic profile, agriculture, animal raising, fishing, and trading have been key economic activities practiced in Portugal since the first settlements in the Iberian Peninsula. More recently, manufacturing, tourism, and the service sector have gained significant relevance in contributing to the economy. The evolution of food production in the country has reflected the biophysical resources, population density, settlement processes, property structure, and administration of each territory. For example, small agricultural holdings have been a common feature in the north and centre of the country, whereas larger land holdings have been a characteristic of the south and

inland zones. The coastal areas have held fishing and trading traditions and are home today to the most densely populated regions in the country.

Despite its relatively small size, Portugal is highly diverse in morphology, climate, fauna, and flora, and, as mentioned above, different land use systems, giving shape to different types of landscapes, not only geographical but also cultural, where various food heritages are included and coexist (Salvado et al., 2018). The main food production crops in Portugal until the middle of the twentieth century included cereals, grapes, olives, fruit and nut trees, vegetables, and legumes. Other food items sourced through livestock breeding, beekeeping, hunting and foraging have complemented the Portuguese diet, defining a large diversity of regional gastronomies.

Portugal shares with Greece, Italy, and Spain the Mediterranean culture around food (Forte, 2022) that involves the conviviality of people around activities like farming, food preparation and preservation[2], and food consumption. Food quality is also stressed in this food culture, especially on aspects like food's freshness, flavour, and seasonality, which are the bases of the 'Mediterranean Diet'. The Mediterranean Diet is a flagship agricultural model and an UNESCO intangible cultural heritage based on low-impact agriculture, seasonality, exchange of food skills, and food conviviality, which are argued to comprise a feasible strategy to promote sustainable food systems and healthy diets (UNESCO, 2023).

Portugal is home to over 10 million inhabitants (INE 2021), with an average population density of 112,5 inhabitants per km^2. One quarter of the Portuguese population (23,4%) is older than 65

[2] A good example of a collective activity for food processing is the pig slaughtering ritual ('matança do porco' in Portuguese), which used to be widely common across Portugal. During this social gathering, a pig raised at the farmhouse was killed and treated once a year with the support of community members to then be shared among everyone (e.g., pork by-products like meat, sausage, lard, etc.). Nowadays this tradition is disappearing due to socio-cultural changes, but also because of concerns regarding food safety.

years old (Pordata, 2023) and the average school-age population (3 to 22 years old) has been decreasing in all regions between 2011 and 2018, except for the Lisbon Metropolitan Area (INE, 2019). More than 80 per cent of Portugal's population lives along the coast, following decade-long public policies concentrating resources and activities in a unipolar model around the metropolitan areas of Lisbon and, more recently, Oporto (Ferrão et al., 2023; Madureira, 2017). Against this background, the issues associated with the territorial distribution of the population, namely through the process of coastalisation and the subsequent depopulation in inland areas and an ageing population, have posed challenges to the planning and efficient use of collective resources.

The nuances around the evolution of the Portuguese population and its economic activities must be understood along these territorial changes. To discuss the evolution of the Portuguese food systems, the next section explores these issues in greater detail, paying particular attention to the broader economic and political framework in which Portugal is situated, the European Union.

THE PORTUGUESE AGRICULTURAL SECTOR – AN EUROPEAN PROJECT

The agricultural and rural development sectors in Portugal have witnessed great changes after Portugal's entrance to the European Union (EU) in 1986, marking the adoption of the European Common Agriculture Policy (CAP) and Portugal's entry into the European Economic Market. According to F.O. Baptista (1994), Portugal's agricultural sector witnessed a dramatic reduction in terms of its relevance in the country's economic system following its accession to the EU. On the one hand, Portugal gained access to a set of Communitarian Funds aimed at helping bring up to speed its lagging infrastructure and competitiveness (Madureira, 2017). This was relevant because, by the

end of the dictatorship regime in 1974, Portugal had the lowest per capita income and literacy rate in western Europe, and still had a pre-modern farming sector with many small-scale poor subsistence family farms and a large-scale extensive farming based on non-professionalised and cheap labour force. On the other hand, it is thanks to the financial influx of funds from the EU that the country enters a rapid modernisation path, paradoxically pushing the (formerly agriculture) labour force into the urban centres, where more profitable sectors were thriving, amidst rural developmental changes in Europe.

Despite the attempts of policymakers to reconcile these two developments, Figueiredo (2013) and F.O. Baptista (1994) argue that the entrance of Portugal into the European market did not benefit the Portuguese agricultural sector for a few reasons. For a start, Europe was undergoing significant paradigm changes regarding its food producing sector in the 1970s and 1980s, following the overproduction of foodstuffs and reduction of food prices, while also facing civic pressure from food industry scandals and environmental concerns from industrial farming. In response to this, the CAP underwent a reform in the early years of Portugal's entry to the EU. In 1992 at the Rio Earth Summit, the CAP reform was presented with a new focus. Instead of granting support for farmers to more food, support was directed toward incrementally adopting sustainable farming practices. Third, in preparation for the upcoming expansion of the EU towards eastern Europe in 2004, the Agenda 2020 was set to decouple the CAP's funding from exclusively the primary sector. This move sought to encourage the multi-functionality of the activity to protect and preserve Europe's countryside, but especially to tackle social inequalities across the continent, promote greater cohesion and stimulate entrepreneurship.

At this point, a new rural development paradigm had emerged in Europe, based on the assumption that rural areas were self-determinant regions capable of defining new income-

producing activities beside farming. However, rural development has historically been associated with the primary sector in Portugal, and amidst a fragile political and economic landscape, it was unrealistic for the Portuguese rural communities to build upon the support for farming, as expected by the CAP policies. Instead, the small portion of EU funds allocated for rural development in Portugal during the following years continued being directed toward developing other sectors, such as in infrastructure, education, and the service sectors, even if this entailed a rural exodus, outmigration, and the rapid urbanisation of the urban nodes.

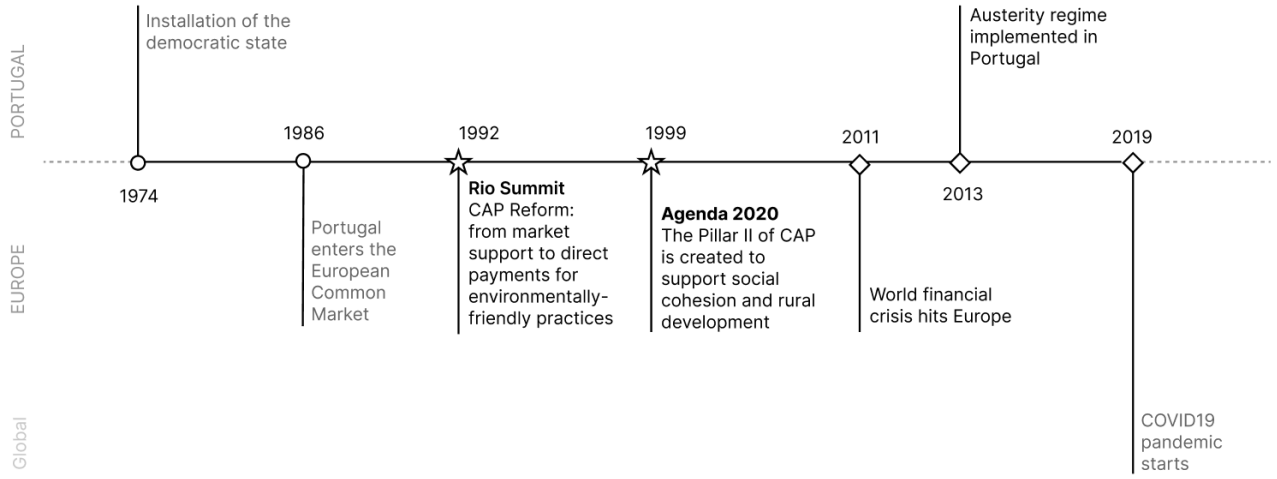

Figure 7. The entry of Portugal into the European Common Market. Timeline of key events. (Own elaboration)

Unsurprisingly, the implementation of these reforms led to the reduction of land used for agriculture and forest activities in Portugal from 2010-2015, resulting in a transformation of significant rates of these lands into permanent and poor pastures, artificialised areas (namely, areas intended for the use of human activities, including those used for residence and artificial lakes and dams) and

shrublands (INE, 2019). The increased urbanisation, plus an aging population (Eurostat, 2021)[3], has placed Portugal's inland territories in state of remoteness and abandonment, revealing a meagre or non-adequate infrastructure to fulfil growth in these areas. Against this backdrop, other sectors have benefitted from the modernisation of agriculture, including the wine sector, the large-scale and intensive production of olives, almonds, other permanent crops (e.g., avocado), and vegetables and berries, which are associated with new irrigation parameters. Nowadays, the primary sector holds a weak positioning in terms of its economic contribution to the Portuguese economy. The agriculture, forestry and fishing sectors employ less than 5% of the active population (Pordata, 2020) and agriculture contributes to 1,6% of the national gross domestic product (Pordata 2021).

Investments framed in the context of rural development and territorial cohesion in Portugal, in other words, have not been able to deliver the competitiveness necessary for non-urban communities to thrive, especially those in remote and isolated areas, by means of sustainable or multifunctional farming. Instead, the country has leaned on other income-producing activities such as tourism and on what Almeida (2020) described as 'neo-extractivism', or practices based on intensive agriculture (mainly for super intensive olive oil and berry plantations, mostly intended for export markets), that have benefited from EU investments for building dam infrastructures during the last decades. However, these practices depend to a large extent on international investment funds and remain decoupled from the territory, thus missing the chance to contribute to securing vibrant rural communities.

[3] When comparing it to other European member states, Portugal stands out as the country with the oldest farming population, with more than half of farm managers over 65 years old (Eurostat, 2021).

In response to the frail state of the rural areas, the ongoing territorial disparities, and the side-effects of the global financial crisis felt in Europe in the early 2010s, a Portuguese Working Group for the Valorisation of Local Agricultural Production (GEVPAL) was created in 2012 to protect local food crops (Dias de Oliveira, 2018). Its aim was to propose a strategy to restructure the food chain based on the organisation of short food supply channels, as well as by simplifying the administrative procedures and processes for small-scale and family farmers to attain financial support to develop their activities. The working group was comprised of 9 entities from 3 ministries and worked with the General Directorate of Agriculture and Rural Development (DGADR). Although efforts like this working group do not necessarily tackle the 'land question' in Portugal, they played a significant role in envisioning the reactivation of the territories that have undergone drastic transitions in the last decades. Namely, one could argue that the urban-rural binary has become even fuzzier (Torre and Wallet, 2020), including in Portugal, giving rise to heterogenous, 'in-between' zones, called often as peri-urban spaces, where this renegotiation between the abandoned countryside and more dynamic areas, such as urban centres, might take place. These developments gained attention again during the COVID-19 pandemic, which shed light on the limitation of global food systems relying on long distance transportation for food. In response, new and creative relationships around food production and consumption are navigating the tensions between the agrarian question, the CAP policies implementation, and economic development in Portugal.

CHAPTER 3.2

MAPPING THE LOCAL FOOD NETWORKS IN PORTUGAL - IMPLICATIONS FOR RURAL DEVELOPMENT AND LOCAL FOOD AVAILABILITY[4]

ABSTRACT

Portugal has undergone systematic changes in the way its population relates to food. The last 30 years saw an abandonment of Portugal's rural areas, the extinction of small producers, and the concentration of food processes in a handful of actors. Following the economic crisis of 2010 in Europe, efforts to reconnect urban consumers to primary producers, while preserving natural and cultural heritage, have evolved in Portugal in the form of Local Food Networks ('circuitos curtos' in Portuguese). However, a clear vision of these networks' capacity to provision local foods to nearby residents is still lagging. This paper aims to fill this gap by adopting a consumer and territorial approach. We developed a non-exhaustive, desk-based mapping of Portuguese initiatives from November 2020 – March 2021, with information about key stakeholders, functioning logic, and the relational styles used during the food exchange. Results showed that local food is primarily made available in the box scheme format, which operates in multiple municipalities, mostly in urban areas, with support of an online platform. Rural areas, conversely, showed a reduced availability of local foods and weak infrastructure of local food networks. We argue that the increased proliferation of local food consumption in Portugal is possible if territorially intelligent actors activate the needed resources for greater availability of local foods. For this, the adoption of territorially specific, but especially sustainable, strategies to counteract decade-long policies promoting the countryside as a consumption site is needed, especially highlighting the role of small-scale food production in attaining food security.

Keywords: Local Food Networks (LFN); Portugal; local food availability, proximity; rural development.

[4] An adapted version of this chapter has been submitted to Local Environment (under review) as Hernández, P. A., Darrot, C., Trun-inger, M., Pinto-Correia, T. (submitted). "Mapping the Local Food Networks in Portugal – Implications for rural development and local food availability".

INTRODUCTION

The local food's debate dates to the 1960's when the 'back-to-the-land-movement' arose in the United States (Kamp, 2007), paving the way to decade-long discussions around 'what is local?', 'what is food (re)localisation?', 'who does truly benefit from eating locally?', and whether 'it is realistic to go local?', etc. (Martinez et al., 2010). In Europe, Local Food Systems (LFS) have been discussed as an alternative to the conventional food regime since the early 1990s, when the 'quality turn' emerged as a necessity to tackling raising concerns on food safety, environmental degradation, and uneven power and territorial dynamics caused by the industrial food system (Renting et al., 2003). To date, however, no single or clear definition of what local food is can be applied to the diversity of existing production, processing, retailing, and distribution systems (Rucabado-Palomar and Cuéllar-Padilla, 2018).

The relevance of Local Food Systems in Europe must be understood in terms of their role in rural development, especially over the sustainability of small-scale farming (Arthur et al., 2022; Delaney et al., 2018; Forssell and Lankoski, 2015; Lamine et al., 2019; Loconto et al., 2018; Moragues-Faus et al., 2017). Local Food Networks (LFN), often referred to as Alternative Agri-food Networks (AAFN) (Darrot et al., 2015; Jarosz, 2000), Alternative Food Networks (AFN) (Chiffoleau and Prévost, 2012; Maye, Damian; Kirwan, 2010; Michel-Villarreal et al., 2019) and Short Food Supply Chains (SFSC) (Jarzebowski et al., 2020; Renting et al., 2003), represent innovative assemblages aimed at valorising local agricultural resources and rural communities. They are perceived as complementary networks to those in the conventional markets that seek to capture higher returns for small producers (Goodman, 2004), to protect local food cultures (Sanz-Cañada and Muchnik, 2016), to promote collaborative associations and scale up local food production (Duncan and Pascucci, 2017),

as well as to regain consumers' trust (Brinkley, 2018; Matacena, 2016) through direct food exchanges in local food chains (Martindale et al., 2018).

Until now, most LFN literature has systematically focused on the benefits from increased local food production and product valorisation through consumers' support, neglecting consumption-related issues on social justice (Goodman, 2004) and the adoption of a territorial perspective to understand LFN as a combination of elements defining the territory (Reina-Usuga et al., 2018). This is problematic because the evolution of agricultural systems and rural development has not taken place evenly across the continent. (Goodman, 2004) reported that in Spain, Portugal, and Greece, the extensification of agriculture stimulated by the 'new rurality' paradigm (Eriksen, 2013) clashed against these countries' concerns about 'catching up' with their northern counterparts through the intensification of commodity production. In the case of Portugal, while the Portuguese political discourse has framed LFN as an important step in the valorisation and professionalisation of small and family farming activities, today these activities are still associated by many with subsistence-farming (Dinis, 2019).

The global economic crisis in 2010 prompted the proliferation of LFN in Portugal to mitigate the accentuated decrease from 20% to 6% of small family farms in the last 30 years (Moreno and Magalhães, 2021) and to enhance territorial cohesion (Calvário and Castro, 2022). Literature on LFN in this country – 'circuitos curtos' in Portuguese – is scant (Ribeiro et al., 2021), focusing mainly on the economic benefits that these short food circuits offer to small family farms (Baptista, A. et al., 2013; Cristóvão and Tibério, 2008; Tibério, 2013), their environmental benefits, the promotion of healthy food styles, and their potential to promote urban-rural linkages and rural tourism (Forte et al., 2022; Silva et al., 2021). Although some studies have explored the contribution of LFN to food security (Cerrada-Serra et al., 2018), its implications from a physical and social access perspective

have rarely been studied (Truninger et al., 2018), especially in Portugal. The need to situate food security and Local Food Systems in the centre of the Portuguese national food strategy has also been highlighted by (Delgado, 2023), who has suggested developing a mapping of the national LFN to assess their trajectory and take policy steps to promote sustainable local food systems from a holistic and social right perspective.

Guided by the question of where and how Local Food Networks (LFN) are manifesting in Portugal, this study takes up (Delgado, 2023) invitation to carry out such mapping. Adopting a critical view to LFN development, this paper inquires what is the capacity of Local Food Networks to make local foods available to nearby residents, moving away from a producer-centred approach. We adopt a territorial perspective to study LFS development in Portugal, assuming the territory is much more than a simple geographical area, but a set of complex material and immaterial relations among actors and scales and between them and local resources (Barbera et al., 2014). The two dimensions of proximity (geographical proximity and relational proximity), explained in the next section, frame the discussion about the implications on local food availability and territorial development from the LFN characterisation and spatial distribution found in our case study.

This paper is organised as follows: First, we introduce our theoretical framework, followed by our data collection and analytical methods. Third, we describe our results. Next the discussion section examines the possible social equity issues emerging from the trends unveiled in this study. Last, we provide our take-home messages and hint at further research in the subject.

THEORY OF PROXIMITY

We explore LFN capacity to make local foods available by adopting the framework of proximity, as it has extensively been used by (Chiffoleau and Dourian, 2020; Dubois, 2018; Eriksen, 2013; Muchnik et al., 2008; Praly et al., 2014; Torre, 2009). Proximity has been argued to help small-scale producers overcome their logistical barriers to sell in the market, through the creation of synergies and cooperation with other stakeholders, as well as to build a sound relationship with consumers (Rucabado-Palomar and Cuéllar-Padilla, 2018). In this study, we assume that proximity is a context-based concept based on how far food travels and through how many links in the supply chain (Arcuri et al., n.d.), which can impact the availability of local foods. It refers to the potentialities given to individuals, groups, and human actions in general, in their technical and institutional capacities, that can be activated through the deeds and representations of the actors, according to the relevant socio-economic criteria in the territory where they exist (Kebir and Torre, 2012).

By availability, we assume the physical availability of food, or the overall food supply determined by production, distribution, and trade (Paul et al., 2019), as well as the adequacy of the supply of these foods – for example, the presence of certain types of stores and restaurants, or the number of places where residents can buy local foods (Andress and Fitch, 2016). This notion does not ignore the large number of 'quiet' spaces and practices through which food is being exchanged that do not enter the market but play an important role in increasing food security and building resilient food systems (Chiffoleau and Dourian, 2020; Jehlička et al., 2019; Pinto-Correia et al., 2021). Instead, it measures local food availability through the capacity of market-oriented initiatives to promote local food consumption, because availability and price continue shaping food access and consumer choices nowadays (Herman et al., 2018).

The concept of proximity is considered here in two dimensions: geographical proximity and relational proximity. Geographical Proximity refers to the physical distance between stakeholders and institutions – e.g., between producers, (distributors), and consumers – and considers issues on the mobility of people and goods (Kebir and Torre, 2012). It is important to highlight that this dimension recognises that 'space' is affected by the relationships among social and economic actors within it (Torre, 2009). Scrutinising the physical proximity to food source is useful because physical proximity can shape consumer's shopping strategies, and thus food accessibility, according to aspects such as travelling time and food choice (Niedzielski, 2021). Second, Relational Proximity refers to the social construct bringing local actors to collaborative action through reciprocal relationships, which can shorten the cognitive distance between them, based on a common basis of values, norms, and organisational culture (Dubois, 2018). According to (Le Velly, 2019), AFN are a complex object to grasp because they cannot be understood as projects with a set of established rules for members to follow, but instead as a fuzzy social adventure with a horizon that can be vague.

The scope in this study to Local Food Networks (LFN) shall not be taken as a defensive localism (Schrager, 2021). Instead, we recognise that LFN emergence and food availability are context-based that depend on the efforts of the actors and agendas empowered by the specific social relations within each territory (Eriksen, 2013). They are nested in wider regional, national, and international networks (Bowen, 2011) and operate in hybrid channels (Brunori et al., 2016). Nevertheless, we understand that geography is an important factor in food security (Paul et al., 2019) and the territory is a space of governance and local actors' relations (Felici and Mazzocchi, 2022).

MATERIALS AND METHODS

DATA COLLECTION

Due to the lack of official statistics on LFN in Portugal, online desk research was used to collect the name, mission, name of promoting and sponsoring entities, and location of the initiatives reported to actively make local foods available to nearby residents via short food chains across Portugal. Selection was done through a targeted grey online literature review, followed by snowball effect until resources were exhausted. Key words used were 'short food supply chains in Portugal' and 'alternative food networks in Portugal' in English, and 'circuitos curtos em Portugal' in Portuguese. Data sources included: scientific articles, journals, webinar materials, workshops, reports, project presentations, websites, and private conversations with experts. We recognise our search possibly missed out the many 'undercover' initiatives disseminated through other means, such are social media groups (e.g. Facebook and Whatsapp), by word of mouth, road stands, and local news. Therefore, our data sample does not attempt to generalise all initiatives in Portugal, but to present the current, formalised, and recorded trends in the sector.

From the diverse forms of LFN found through data collection, we purposely isolated those efforts that were market-based because markets are critical to the sustainability of the food system, from a production and consumption viewpoint (Arthur et al., 2022). Additionally, initiatives must have involved at least two stakeholders (producers and consumers) but no more than one intermediary to guarantee a short circuit (Chiffoleau and Prévost, 2012). Last, they had to focus on making locally-produced foods available to nearby residents, following Kaiser and Kelly (2012)

argument that “people usually purchase food within two miles [about 3.2 kilometers] from where they live” (pg.193; own conversion in brackets).

We left out sporadic initiatives from our data set borne during the COVID19-pandemic context from which we did not have any trajectory yet, except for 2 that fit into our selection criteria. Community gardens without access to the market and casual efforts aiming at temporary visitors to the territory (e.g., sporadic shops) were also discarded. Businesses selling local foods only marginally or inconsistently (e.g., organic and general food retail shops), and online outlets without specification of producers and consumers’ origin were also not considered, even if they were linked to a territory through a denomination of origin, as these specialties can have more in common with mainstream intensive, food supply chains (Feldmann and Hamm, 2015; Tregear et al., 2007).

Our methodology moves away from assuming that LFN are solely producer-run ventures and places the attention in the role of initiatives in making local foods available to consumers. It also recognises that small-scale local food producers often deploy hybrid channels to place these foods in the market to remain economically competitive (e.g., through large retailers and export markets) (Hernández et al., 2021; Holloway et al., 2007). However, to grasp the evolution of local food systems in Portugal, initiatives considered in this paper were assumed to involve artisan food producers and small farms using environmentally friendly farming methods to provision food consumers in ways that promote trust and proximity (Paula et al., 2022; Romero-López and Ramos, 2017). From our initial selection, data reduced from 163 to 149 initiatives, which we labelled ‘Local Food Networks’ (hereinafter LFN).

DATA ANALYSIS

Data analysis was done in three phases. First, five analytical categories were created to organise our data set (Table 3) and to help describe the functioning of Local Food Networks (LFN) in the sample: geographical zone (geozone), format (LFN format), frequency (freq), relational logic (relat_logic), and organisational logic (org_logic). The quantitative statistical analysis of these categories was done to reveal the patterns in behaviour among LFN.

Second, the spatial distribution of Local Food Networks (LFN) was explored following the statistical analysis of data in four approaches, according to the geozone of each network:

(1) "single-ventured": considered where LFN are taking place, namely their physical location or registered address, based on the principle that where quality food initiatives are installed matters in socio-demographic terms (Hossfeld et al., 2017). A map was built to illustrate the location of LFN in Portugal based on this approach (Figure 8). Whenever initiatives presented multiple sites, only the headquarters were placed in the map to facilitate visualisation. Entries without a physical location were not included in the map. Each LFN was marked on a map according to its assigned LFN format, using Google Earth Pro free software. These points were next juxtaposed in a shapefile over the official administrative map of Portugal at NUTS2[5] and municipality level (CAOP, 2019) using ArcMap software version 10.8.1. Last, we coloured each municipality in a gradient of grey to signal its geographical location (geozone), based on the

[5] NUTS: The Nomenclature of territorial units for statistics, abbreviated NUTS, is a geographical nomenclature subdividing the economic territory of the European Union (EU) into regions at three different levels (NUTS 1, 2 and 3 respectively, moving from larger to smaller territorial units) (Eurostat, 2023b).

population density per municipality statistical data (Pordata, 2019) and the TIPAU nomenclature for administrative purposes (Esteves, 2014).

(2) "gateway": counted the number of access points (N_{ap}) provided by each LFN as a way to operationalise measuring local food availability (Shearer et al., 2015). This method overcomes the limitations of the single-ventured approach by contemplating the various locations and formats of operability that each LFN offers. LFN holding multiple locations ('crossed') were contemplated singularly as working under the same organisational logic. However, to grasp the richness of the sample under this subcategory, LFN 'access points' were seen independently to explore their different formats and heterogenous relational arrangements (frequency of interaction and relationship style) during each unique food exchange site.

The following two approaches considered the administrative units of LFN, so we could describe the diverse 'agricultures of proximity' (Dubois, 2018) being fostered in our case study.

(3) "place-based": looked at the number of LFN access points across all geozones according to their administrative location, except those online; and,

(4) "anchoring": all access points were disaggregated, including those labelled 'crossed', to later be recategorized under one of the three physical TIPAU geozones (PR, SU, and PU). LFN occurring online were not considered in this method as they are accessed virtually. A LFN density index was calculated for each geozone by dividing the number of access points per number of municipalities in each geozone. The aim of this method was to discover which territories are spearheading the promotion of territorial and social equity through local food systems (Lamine et al., 2019).

Table 3. The five analytical categories to understand Local Food Networks.

Category		Sub-categories		References
geographical zone (geozone)	geographical unit code assigned to each municipality, according to its geographical location	predominately rural (PR)	population density is equal or below 100 inh/km2.	Pordata (2019) and Esteves (2014)
		sub-urban (SU)	population density is above 100 inh/Km2 and equal or below 500 inh/km2.	
		predominately urban (PU)	population density is above 500 inh/Km2.	
		crossed (C)	referring to initiatives that take place in more than one, but also different, geographical unit (e.g., it is the case of the national-wide box scheme PROVE and others).	
		online (O)	initiatives with no physical location, but whose access by consumers can be done solely online.	
format (LFN format)	arena of exchange or format where local food is made available, or 'meeting point' between producer-consumer	box scheme	own grown and seasonal food products made available for consumers through a food box. Home delivery and pick up points (e.g., at a producers' market stand) are common in this type, and purchase can be '*ad hoc*' or via a formal and pre-arranged agreement between producer and consumer (e.g., Community supported agriculture, CSA, also known as AMAP).	Michel-Villarreal et al. (2019)
		local food shop	shops selling locally-produced raw and transformed foodstuffs to residents and visitors, by purchasing directly from the nearby producers or by operating as a sales point of a producers' cooperative.	
		producers' market	public venues where small producers gather to market their products directly to consumers. Logistics are often organised by the local councils. Operating hours vary from place to place.	
		catering	ventures actively focused on placing locally-produced food items on people's plates via private or public enterprises, such as restaurants and public procurement contracts (e.g., Public school canteens).	
		fair/festival	events organised by the local councils or non-profit organisations around the promotion of a seasonal and regional food item, which is often linked to the territory's identity and culinary tradition. These events are often composed of multiple activities, such as awareness-raising campaigns, cooking shows, concerts, and a food court.	
		multiple	single endeavours that manifested in more than one format, offering more than one venue for consumers to access local food products through them.	

frequency (freq)	frequency of LFN's occurrence or how often consumers can access local foods through the initiative.	ongoing	initiative takes place daily.	Holloway et al. (2007)
		weekly	initiative takes place weekly or biweekly.	
		monthly	initiative occurs once a month.	
		yearly	initiative occurs once a year.	
		mixed	initiatives with more than one type form, thus with various frequencies of occurrence.	
relational logic (relat_logic)	The form of interaction between producers and consumers to carry out the food exchange.	direct	the food exchange is done directly. Producers and consumers meet.	Kebir and Torre (2012)
		indirect	the food exchange is done through an intermediary (e.g., a food shop, pick-up point, or online platform), who serves as the guarantor of 'local' and food quality.	
		distance	producers and consumers interact at distance through online communication technologies. No co-localisation of producers and consumers.	
		tailored	initiatives with more than one interaction style.	
organisational logic (org_logic)	The way LFN are run, basically who is (are) the key actor(s) in the emergence and maintenance of the initiative. Each specific structure affects the development and guarantees continuation of LFN.	producer-led	ventures run by one or more producers.	Ribeiro et al. (2021)
		consumer-led	horizontally-organised purchasing groups.	
		Community Supported Agriculture (CSA)	producers and consumers hold equal stake in the decision making of the LFN, by setting up a purchasing agreement that established equal risks and commitment in the production and exchange of food.	
		public-led	LFN supported by the local and regional administration (e.g., local councils, intermunicipal organisations, etc.) with efforts funded through the public budget.	
		multi-sectoral partnership	LFN involving social actors from more than one sector in joined efforts and hybrid funds to support the initiative (for example, projects assembling a producers' cooperative, the local administration, and a research institute, etc.).	
		business platform	online food marketplaces	

RESULTS

THE CHARACTERISTICS OF LOCAL FOOD NETWORKS (LFN)

LFN develop unique strategies to bring local foods to the market, depending on aspects such are supply and demand, funding resources and business idea, among others. Initiatives in our sample ranged from farmers' markets, seasonal food fairs, traditional and cultural festivals, farm stands, food boxes, collective sale points, restaurants, school canteens, shops, and public-private ventures, etc. Each initiative presented a particular setup to carry out the exchange of local foods formally. Six organisational logics helped describe the unique ways in which local actors organised themselves for initiatives to emerge and thrive (Table 3).

The form of the exchange of local foods informed about the relation between producers and consumers. Although the sampled LFN were required to not deploy more than one intermediary, different methods were identified to hand over local foods to end users. Most initiatives made local foods available continuously to some extent, but less frequent interactions were also identified. Direct interactions were common in all LFN formats, allowing producers to showcase their products and meet consumers face-to-face to respond to their inquiries and learn about their needs. Distance relationships, on the other hand, allowed producers and consumers to interact without sharing the same locality, often through social media platforms. Knowledge exchange was often done with pictures on their profile site and through online chat rooms. Indirect interactions made use of an intermediary, be human or digital, through which the local food exchange was made. Intermediaries varied from a local shop, a restaurant, a school canteen, an association, or an online site, that served as the 'guarantors' of food production methods and origin. This type of relationship was common in

initiatives composed of several producers, so they could coordinate orders, delivery time or pick-up location.

The sample of 149 LFN was classified in six formats, according to the profile of each single endeavour. We present the characteristics of the formats below in descending order of relevance in the sample.

(1) **fair/festival** (N=89): initiatives focusing on the promotion of one territorially emblematic food product, where food retailers get to showcase their products and interact directly with consumers. These events occur usually once per year during one or a few days and alongside other socio-cultural activities. They are mainly organised by the public administration and local partnerships. This format appeared significant in predominately rural zone (PR), but it also happened in the rest of geozones, often offering one access point per initiative except for a few events that had more than one location.

(2) **producers' market** (N=27): initiatives organised mainly through collaborative partnerships and by the local councils for nearby producers to sell their fresh produce in a designated public space. Producers appeared to lead this form of initiative when marketing certified food produce. Producers' markets were characteristic of a face-to-face interaction between producers and consumers, taking place weekly or monthly solely. These direct and regular encounters served to build friendships and to win consumers' loyalty. This type had access points across all geozones except online, but especially in crossed, and to a much lesser extent in predominately urban (PU).

(3) **box scheme** (N=13): LFN selling seasonal produce from individual or collective producers in the format of a food basket prepared following a mutual agreement between producers and consumers. Despite coming third in the list, this type offered a rich diversity of access points in the sample, with the biggest presence in geozone crossed and timidly in the other geozones. Local food was mainly available weekly through this format. The interaction between producers and consumers varied depending on how the box scheme was organised. A direct interaction was particular to initiatives functioning under the CSA logic. Indirect interactions were common in collective box schemes functioning as a producers' hub. In this case, an online platform was used to facilitate with the registration, preparation, and delivery of food, based on producers and consumers' location. Medium size farm-based box schemes, however, appeared to prefer distance relationships to communicate online (e.g., through social media sites) with their audience on aspects like food offers, special events, and to organise the exchange. The box scheme format presented all logics of organisation except for public-led, and the largest concentration of access points was under the multi-sectoral partnership logic.

(4) **local food shop, LF shop** (N=8) included farm stands, food stores, producers' cooperative sales points, etc. These initiatives were characterised by making local foods available on an ongoing basis and through one intermediary, except in the case of a farm stand where the exchange was done directly. This type was organised mainly by producers and through collaborative partnerships, but also presented one business platform. LF shop was visible in all geozones, except in PU, although the largest presence was in crossed zones.

(5) **multiple** (N=8) corresponds to initiatives that operate in more than one format, in any combination ranging from 2 to 4 (for example, a LF shop and a stand at the producers' market,

or a food box, a restaurant and a LF shop, etc.). This heterogeneity signals LFN strategy to enter various market channels by appealing to different consumer segments in multiple locations. They occurred mainly in crossed regions but were also visible in sub-urban (SU) and predominately rural (PR) geozones. LFN in this format were mostly producer-led and organised in multi-sectoral partnerships. Flexible interactions between producers and consumers in this format were required for LFN to navigate complex organisational logistics. Without surprise, LFN in this type exclusively allowed producers and consumers to connect in tailored relations and mixed frequencies.

(6) **catering** (N=4) corresponded to restaurants and public procurement endeavours sourcing from local producers. Unlike the other formats, the number of access points granted by this subgroup could not be estimated because it often involved a varying number of school canteens or restaurants affiliated to an initiative. What can be said is that catering types were characterised for enabling the ongoing access to local foods through one intermediary (e.g., a restaurant, café, or school canteen), and were exclusive to one physical geozone, either PR, SU or PU. From the total LFN in this group, 2 were public-led, 1 was consumer-led, and 1 was organised in a multi-sectoral partnership.

SPATIAL DISTRIBUTION OF LOCAL FOOD NETWORKS IN PORTUGAL

Our sample comprised of 149 initiatives facilitating the access to local foods in Portugal. LFN were found to be dynamic, and some ventures functioned in multiple locations, depending on the specific nature of each initiative. The geographical proliferation of LFN in Portugal can be understood in four different, albeit complementary, ways in terms of spatial distribution (Table 4). This multi-

lens method enabled to uncover the complexity of LFN spatial distribution, in terms of dispersion and density, of the sample in the national territory.

Table 4. The four approaches to understanding the spatial distribution of Local Food Networks (LFN).

	Single-ventured		Gateway		Place-based		Anchoring				
geozone	No. of LFN	Percentage of LFN in sample (%)	Sum of access points	Percentage of acc pts in sample (%)	No. of municipalities	Percentage of municipalities in sample (%)	Sum of access points per municipality	Percentage of acc pts/mun in sample (%)	Sum of municipalities	Percentage of LFN in sample (%)	LFN density index
PR	79	53.0	82	25.4	61	40.7	110	34.9	74	56.1	1.49
SU	37	24.8	41	12.7	29	19.3	86	27.3	42	31.8	2.05
PU	11	7.4	11	3.4	7	4.7	119	37.8	16	12.1	7.44
crossed	15	10.1	182	56.3	53	35.3	0	0.0	0	0.0	n/a
online	7	4.7	7	2.2	0	0.0	0	0.0	0	0.0	n/a
Total	149	100.0	323	100.0	150	100.0	315	100.0	132	100.0	

The sampled LFN (N=149) were distributed in five geographical zones (geozone), according to the municipality where each initiative was associated to. The single-ventured approach revealed that 79 initiatives were predominately rural (PR), 37 were sub-urban (SU), 11 were predominately urban (PU), 15 were crossed (C), and 7 operated online (O). Our findings showed different variations across NUTS2 regions in the country, with nearly 70% of the LFN located from the middle of the country to the North (Figure 8). Initiatives classified as PR occurred mostly in NUTS2 regions Centro, Norte and Alentejo. Initiatives in SU were popular in regions Centro and Norte, whereas those in PU were found in the Metropolitan Area of Lisbon (AML) and Norte regions. LFN 'crossed' operated in more than one municipality, ranging from 2 to 12 municipalities. Ventures labelled 'online' (N=7) meant they had no direct link to a unique physical location.

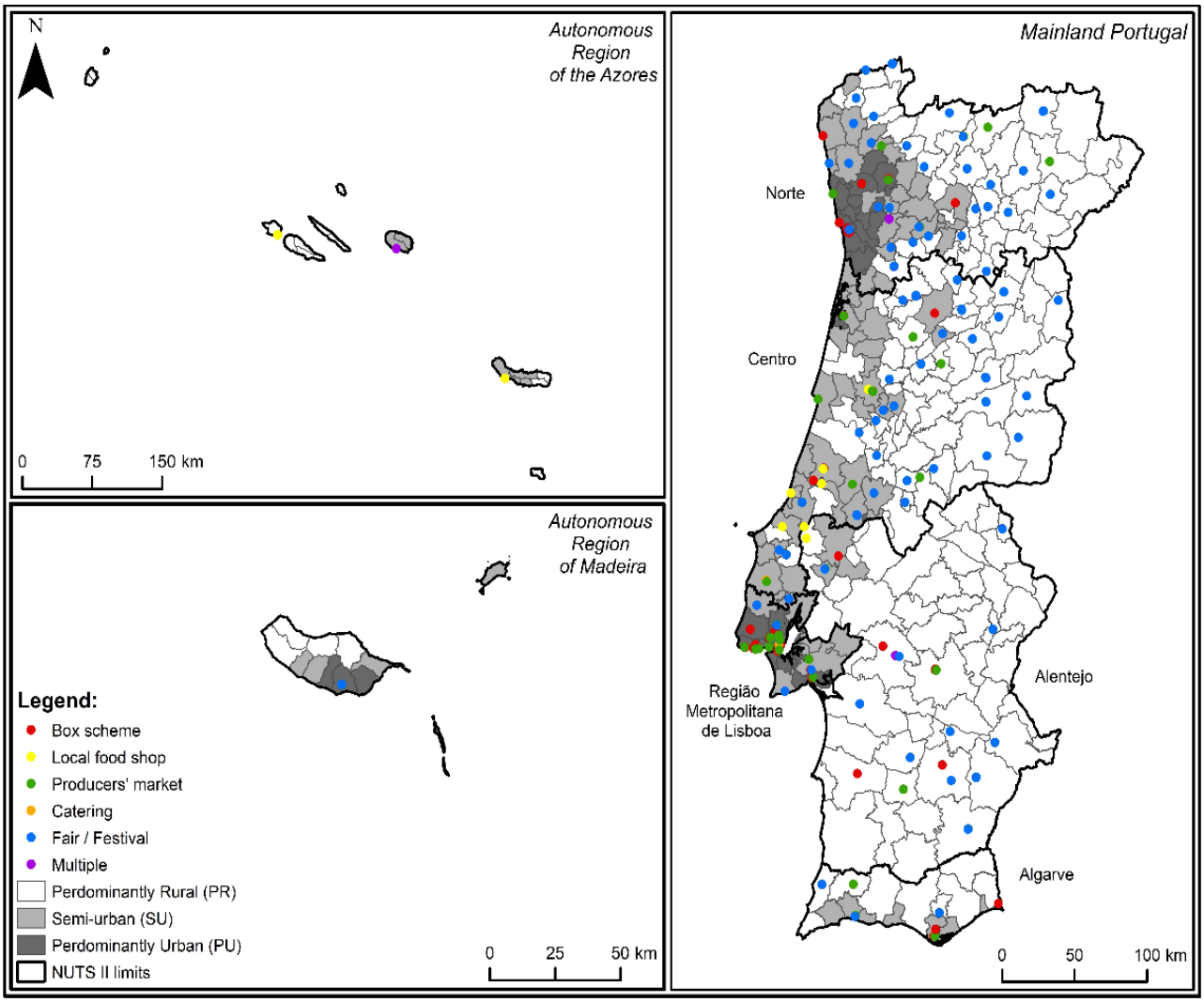

Figure 8. Sampled Local Food Networks juxtaposed over the geographical map of Portugal at NUTS2 and municipality level. (Own elaboration)

Local Food Networks (LFN) dispersion

Through the gateway approach, we discovered that Local Food Networks in our sample have a much larger spatial distribution than thought in the first method (Table 4). LFN offered a total of 323 unique access points (N_{ap}) for consumers to acquire local foods, which were dispersed conspicuously across the country. LFN occurring in only one geozone (PR, SU, or PU) had mostly one access point per initiative, presenting 82, 41, and 11 access points, respectively. Initiatives located

in geozone crossed (C), on the contrary, operated in more than one municipality and ranged in number of access points per initiative from 2 to 107. In total, 182 access points were reported under subcategory C. Paradoxically, these initiatives corresponded only to 10% of the sampled LFN, when considering the first method, yet amounted for 56,3% of the total access points. Online ventures offered 7 access points, the same number of initiatives in this group, because each online market site was considered an access point.

Density of Local Food Networks (LFN)

We discovered through the place-based approach that access points for consumers to reach local foods occurred in repeated municipalities (Table 4). In total, 150 different municipalities were reported in the 323 access points found in the sample. In sum, 61 municipalities were localised in the predominately rural geozone (PR), 29 in the sub-urban (SU), 7 in the predominately urban (PU), and 53 municipalities were in crossed. Due to the lack of a physical space, online initiatives counted zero municipalities.

A more detailed visualisation of LFN spatial distribution was possible using the anchoring approach (Table 4). In total, 132 municipalities were reported to be home to the 315 access points across the three physical geozones (PR, SU and PU). We discovered the distribution of these access points occurred largely in municipalities categorised predominately rural (PR), corresponding to more than 50% of the sample, which represented twice as many municipalities than in the SU zone and four times more than in the PU. Nevertheless, there was a larger density of N_{ap} in municipalities categorised as predominately urban (PU). When considering the LFN density index, we discovered

that there were 7.44 access points per municipality in the PU geozone, followed by the SU group with 2.05 per municipality, and last, the PR subgroup with 1.49 access point per each municipality.

The concentration of LFN access points was significant in predominately urban (PU) municipalities, although a few municipalities in the PR and SU geozones also showed a relevant density of access points. Figure 9 shows the top 10 municipalities with the largest number of access points in our sample.

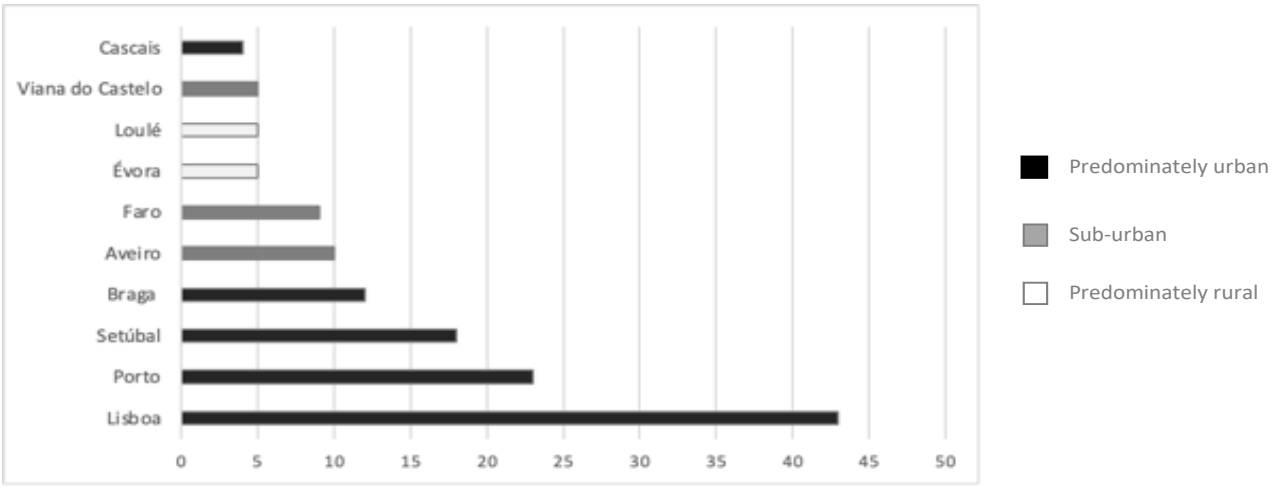

Figure 9. The top 10 municipalities with the largest number of LFN access points in our sample, when considering the anchoring approach. (Own elaboration)

A LOCAL FOOD NETWORKS (LFN) TYPOLOGY

Two set of distinct patterns among LFN were found in our data set, depending on whether initiatives operated in a singular geozone (fixed) or if they operated in multiple or non-specific locations (versatile). Table 5 shows the characteristics of the two LFN types.

Table 5. A proposed typology for Local Food Networks (LFN).

	LFN Types	
Categories	**fixed (N_{ap}=134)**	**versatile (N_{ap}=189)**
geozone	Linked to a singular municipality (PR, SU, or PU)	Linked to multiple municipalities ornone (crossed and online)
format	Fair/festival, farmers' market, catering	Box scheme
frequency	Steady, infrequent	Regular
relational logic	Direct, personal	Indirect, convenient
organisational logic	Mainly public-led but somemulti-sectoral partnership	All organisational logics but multi-sectoral partnership primarily (e.g., third-sector)

LFN operating in only one geozone (PR, SU, or PU) belong to the type 'fixed'. Initiatives under this umbrella presented a total of 134 access points and corresponded to 41% of the sample. This group is characterised by ventures under a steady functioning structure, including a settled time and a well-defined location for the exchange. Face-to-face interactions are privileged under this type, yet LFN tend to offer local foods with less frequency (for instance, 63% of initiatives occurred yearly). The functioning of the initiatives in this group requires a physical place to occur, such is the case of fair/festival, farmers' market, and catering ventures. The promotion and success of initiatives in this type were found to rely to a large extend on the support of actors and resources in the public administration.

On the other hand, initiatives located in geozones crossed (C) and online (O) belong to the type 'versatile' because they operated in multiple or unspecified municipalities. A total of 189 access points were found in this type, corresponding to 59% of the sample. Key characteristics of the type

'versatile' were flexibility and convenience to carry out the food exchange, in terms of operating hours and location. The re-connection of producers with consumers in this type was facilitated mostly indirectly through an online platform that acts as the intermediary. Over 71% of the LFN in this group operated in the box scheme format, which is a convenient way for consumers to make local food orders and for producers to enter the market and organise production (Table 6). Versatile initiatives relied largely on actors and efforts from multi-sectoral partnerships, especially in the third sector.

Table 6. The PROVE project in Portugal – 'Promote and Sell'

The PROVE initiative is the largest box scheme model existing in Portugal since the mid-2000s, which promotes and sells local food produce through the direct selling of vegetable and fruit baskets (Baptista, A. et al., 2012); (Sanz-Cañada and Muchnik, 2016); (PROVE, 2023). As a nonfarm-based scheme, the PROVE initiative operates as a locally-based food hub that collects and distributes produce from nearby small farmers to urban dwellers. PROVE counts nowadays with 107 access points across the country, corresponding to over 75 percent from the total access points found in our sample under the box scheme format. Each food distribution hub is responsible for preparing and delivering the food baskets, although coordination is done through a nationwide, online platform.

DISCUSSION

This section examines critically the ability of LFN to provide local foods to nearby residents, based on the findings presented in the previous section. The discussion explores the effects from the characterisation and territorial development of LFN unveiled in the case study, including the possible issues regarding residents' capacity to consume local foods through these networks.

From the results, we learned that: i) local foods are largely becoming available in Portugal through initiatives typified as 'versatile', especially in the form of the box scheme; and ii) residents in rural areas find a much lesser availability of local foods through LFN. What role might proximity have to influence this territorial development of LFN in Portugal and what issues are at stake regarding local food availability are the topics discussed in this section.

THE CONTRIBUTION OF LOCAL FOOD NETWORKS TO MAKING LOCAL FOODS AVAILABLE

Box schemes contribute largely to increasing local food availability

The LFN format with the largest spatial coverage in Portugal was the box scheme (Table 5). Its popularity came as no surprise given its versatility in terms of format and relational style. In our sample, we found farm-based and nonfarm-based box schemes that were organised either under the CSA model, as profit ventures, or in food hubs (Kummer and Milestad, 2020). We argue that the successful dissemination of this LFN format across the country and its popularity among consumers derives from the system of proximity sale (Yacamán Ochoa et al., 2019) that it promotes.

On the one hand, box schemes, like PROVE, work in multi-partner collaborations involving Local Action Groups, local producers and consumers, local councils, producers' groups, and other local actors. The development of such networks activates the mobilisation of context-specific actors that share the common goal of promoting local food systems, thus bringing local producers and consumers closer to one another through innovative interactions (Kebir and Torre, 2012). Such cooperation schemes serve multiple functions like collective resources and knowledge sharing, motivation, infrastructure and logistics, coordination, improved efficiency, marketing opportunities and territorial governance (Duncan and Pascucci, 2017; Rucabado-Palomar and Cuéllar-Padilla,

2018). This strategy is interesting to producers because the scheme enables them to secure market access, scale-up, and get better returns (Kummer and Milestad, 2020).

Box schemes organised as food distribution hubs (e.g., the PROVE initiative) enable small farms to scale up. They aggregate produce from various producers, broadening the range of items on offer and helping mitigate the seasonality of production. This can be attractive for consumers seeking to satisfy their food needs, especially if the pick-up location is nearby. Having many access points means that producers and consumers must dislocate less for the food exchange, allowing the ongoing development of linkages based on proximity, interpersonal ties, transparency, and trust (Romero-López and Ramos, 2017).

Consumers might be more drawn to choosing the box scheme over other types based on three proximity advantages: its convenience, predictability, and quality. According to (Mastronardi et al., 2019), spending is likely greater if food access is regular and convenient. Box schemes usually operate weekly, offer delivery service (including pick-up sites), and provide a wide range of fresh products that require little refrigeration time thanks to the basket's local source. The low number of access points facilitated by box schemes under the CSA model in our results might index the limited appeal for consumers to engage in initiatives requiring a greater commitment. However, it can also hint at consumers' willingness to participate in box schemes operating under a more business-oriented logic in which orders and payment can be done ad hoc.

Box schemes also activate proximity between producers and consumers using an online intermediary that coordinates the logistics of the food exchange (e.g., the PROVE management online platform). The platform efficiently helps receive the orders per unit hub, set up the weekly basket offer, communicate with producers, and ease the transaction for consumers. (Bos and Owen, 2016) sustain that although online relationships cannot substitute personal connections via face-to-

face interactions, the integration of online spaces in box schemes enables the coordination of complex processes and serves to communicate to consumers on the seasonality and availability of produce, and about social events. The use of an intermediary in 'versatile' initiatives could also give space for alternative food retailers (Forssell and Lankoski, 2017) to strengthen their position in the local food system, creating jobs and having a positive effect in the local economy.

The downside of box schemes' reliance on a virtual channel to fulfil the food exchange could be the exclusion of residents (whether producers or consumers) with reduced digital connectivity. This points at the criticism over LFN to reproduce pre-existing social inequalities (Matacena, 2016) and the view of local foods as exclusive products meant for exclusive customers (Eriksen, 2013). The proliferation of box schemes in predominately urban (PU) municipalities proofed this and came as no surprise, since urban centres are known for having better digital connectivity as well as a younger population, and thus, a smaller digital age gap (Eurostat, 2023a). As shown in the results, the absence of versatile LFN, such is the box scheme, in inland and remote rural areas of Portugal could be partially influenced by the meagre infrastructure of services of general interest and the socio-demographic imbalances in these areas like demographic decline and a slow digitalisation development (Sá Marques et al., 2020).

Two paradoxes about local food availability in rural areas

Our results demonstrate that Local Food Networks in predominately rural areas (PR) of Portugal have a much lesser capacity to make local foods available for nearby residents. Two interesting paradoxes emerged regarding the spatial distribution of LFN throughout the Portuguese territory. First, municipalities in the PR geozone presented the lowest number of LFN access points

per municipality, when compared to the other geozones, despite registering the largest number of initiatives (LFN) per municipality (Table 4). Second, the LFN format providing the greatest number of access points in PR geozones was fair/festival, which is the initiative type with the lowest frequency rate from all, occurring once per year and designed for temporary visitors. These phenomena reflect the kinds of proximity being activated between small producers and consumers through LFN in these areas, thus affecting the availability of local foods.

Predominately rural areas (PR) in Portugal presented a homogenous presence of LFN formats, according to our results. Although all were visible in these zones, their numbers differed greatly. Fair/festival corresponded to more than 73% of the total access points offered by the initiatives in PR, followed by far by producers' market (12%). This concentration implies that the actors spearheading the initiatives in PR – which encompassed, exclusively, the public sector and multi-sectoral partnerships – might be adopting a similar strategy to promoting local foods in these areas. To understand the reasons behind this development, we revisit the evolution of territorial development in Portugal.

The tradition of using fairs and festivals for linking country and town around food, local knowledge, and the territory is characteristic of the Mediterranean culture, such is in Portugal (Fonte, 2022). Similarly, 'neo-traditional markets' in southern European countries have been spaces where local producers and vendors come at once to sell their products since the 1980s, including food and other items (Chiffoleau and Dourian, 2020). The specific trajectory of LFN in rural areas found in our sample unsurprisingly reflect the 'new rurality' paradigm adopted in Europe in the mid-1990s (Eriksen, 2013). This policy shift in rural development has since hyper focused on the multifunctionality of the countryside, nominating it a territory with unique terroir, culture, and

practices while transferring its role from a site of production to a place of consumption (Baptista, F.O., 1994; Calvário and Castro, 2022; Cordovil, 2021; Figueiredo, 2008).

Consequently, the decreasing value of non-industrialised agricultural activities plus the rapid depopulation of the predominately rural (PR) zones in Portugal have led to a different evolution of LFN in these areas, when compared to their urban and sub-urban counterparts. Our results confirm this, showing that 'versatile' LFN – such are box scheme, LF shop, catering – were meagre in PR municipalities and, whenever existing, they took place mostly in rural towns and cities (Figure 9). Two typical characteristics of organisational rationale in predominately rural areas (Vaceková and Škarabelová, 2013) could explain our results. One the one hand, the scant 'versatile' initiatives might hint at the influx of newcomers with urban experience. On the other hand, rural development and innovative food systems are often shaped by the role of 'fixed' networks, whose support expectably comes from local governments and third sector organisations in response to the limitations of for-profit firms in these zones.

Most initiatives in rural areas were characterised by nurturing Temporary Geographical Proximity (TGP) (Kebir and Torre, 2012) and distance relations, confirming that the consumption of local foods by local residents in these areas is a pragmatic, rather than a romantic, response to the situation in which many residents find themselves to satisfy their food needs (Marshall et al., 2018). TGP corresponds to the possibility of satisfying needs for face-to-face contact between actors, by travelling to different locations (e.g., fair/festival and producers' market), with the wish to reduce the costs of transactions (Kebir and Torre, 2012). This travelling, and the social activities associated with it, is appealing to temporary visitors in these places. It generates opportunities for moments of Geographical Proximity, which vary in duration, but that are always limited in time (Rucabado-Palomar and Cuéllar-Padilla, 2018).

Distance relations can activate proximity between producers and consumers after temporary interactions, like in fair/festival events, allowing actors to exchange information, express emotions and be present with a distant partner (Dubois, 2018), often through online tools. At these events, several local producers showcase the emblematic food products from the region along with their linkages to the cultural traditions and knowledge. In the case of LFN, long-term relationships based on familiarity and trust between producers and consumers can only be built upon the extension of this temporary interaction in space. For 'fixed' initiatives occur seldom but regularly in rural areas, LFN have played an important role in establishing territorially-based, distance relations through online technologies and e-commerce, by promoting rural provenance foods in distant places (e.g. urban sites or abroad) (Forte et al., 2022; Sanz-Cañada and Muchnik, 2016).

The high density of LFN 'fixed' in predominately rural (PR) areas in our case study has two socio-economic implications for rural residents. First, the lack of an adequate local food system infrastructure in PR municipalities means that rural residents are more likely to have limited access to local food resources (Andress and Fitch, 2016) and rely in other food sources. The scant availability of local foods through LFN – e.g., the case of fair/festival taking place once per year – can be one major purchase barrier, which might consequently have a negative impact on local food consumption (Feldmann and Hamm, 2015). Second, this setup compromises the economic sustainability of food networks in PR regions, especially regarding the incomes and livelihoods of small producers and others involved in the network, employment, and local economic development (Forssell and Lankoski, 2015). According to de Almeida (2017), the economic benefits of seasonal festivals, touristic attractions and farmers' markets in Portugal are also questionable, as they do not bring much income to the local economy other than sales taxes paid by merchants.

In sum, the popularity of 'fixed' ventures in rural areas and their appeal to consumers from elsewhere, along with the proliferation of LFN 'versatile' in urban and semi-urban zones, go in line with the current rural development paradigm. According to (Barbera et al., 2014), food culture in southern European countries is based more on highly regionalised production involving many small family farms, and on an enduring focus on quality that is defined more in cultural than formal terms, and on direct sales both on the farm and in urban or local markets. In this light, LFN 'fixed' take advantage of the attractiveness of rural spaces to visitors and tourists, offering the possibility to consume the social values behind the modes of food production and transformation of an idyllic countryside (e.g., natural, traditional, heritage, etc.) through foodstuffs that can materially reconnect them to these places (Balogh et al., 2016; de Almeida, 2017; Figueiredo et al., 2022). Local food consumption via LFN 'versatile' by urban residents, conversely, are focused on a middle class interested in quality food and multifunctional farming activities (Si et al., 2015).

CONCLUSIONS

We carried out an online sample of 149 Local Food Initiatives (LFN) in Portugal to identify where and how LFN are placing local foods in the market across the country. Data was collected from November 2020 to March 2021 and statistically analysed using five analytical categories to help characterise the initiatives. The two dimensions of Proximity (geographical proximity and relational proximity) served as our theoretical framework to scrutinise what is the real capacity of LFN to make local foods available to nearby residents, moving away from a producer-centred approach.

The mapping of LFN in Portugal showed that initiatives are diverse, have a unique functioning logic to mobilise local actors, and are unevenly distributed throughout the territory. Initiatives were found to operate in six formats (box scheme, local food shop, producers' market, catering, fair/festival, and multiple) with common characteristics and spatial distribution. From the characterisation and geographical dispersion of LFN, we identified two types of Local Food Networks in Portugal that describe the behavioural trends of the sector in this country: 'fixed' occurring in single municipalities via face-to-face interactions between producers and consumers, and 'versatile' that are operating in multiple municipalities or have no link to a specific location and connect producers and consumers through an intermediary.

Our findings confirmed that the current unfolding of LFN in Portugal aligns with the European rural development paradigm, which has shifted the value of the countryside from a production site to a consumption site and has prompted outmigration. This setup has territorial implications that compromise the availability of local foods through nearby LFN and, thus, signal some social justice issues. On the one hand, residents in predominately urban areas might have a higher capacity to acquire local foods thanks to the presence of flexible, regular, and convenient LFN 'versatile', especially in the form of the box scheme, if equipped with the access to digital tools. On the other hand, residents in predominately rural areas face a much lesser availability of local foods through LFN due to the concentration of 'fixed' initiatives, such is fair/festival, which are characterised as infrequent, lacking diversity, and tailored for temporary visitors.

We recognise that our sample is limited due to our sampling methods. It misses out initiatives that might play an important part in provisioning local foods formally and informally and contributing to food security to many marginalised communities. Our results, thus, are a proposed theorisation of the trends on Local Food Initiatives (LFN) development in Portugal and not a

comprehensive description of the heterogenous challenges for residents to acquire local foods via nearby LFN. From our study, a few questions emerged: i) would a food strategy in Portugal focused on the professionalisation and valorisation of small-food producers be sufficient to dynamise 'fixed' LFN, revitalise the rural economies, and incentive the repopulation in these areas?; ii) how could 'versatile' LFN challenge the social preconditions that reproduce inequality and promote local food availability to all?; and, iii) is it realistic to envision a rural development policy in Portugal that finds a balance between the promotion of multifunctional and sustainable farming and increased local food availability?

Upcoming research work would benefit from developing fieldwork studies to contest our findings and discover what the drivers are behind LFN establishment and consumers' willingness and capacity to acquire local foods via LFN in Portugal. In addition, identifying the territorially specific actors and mechanisms required to activate local resources could guide policymakers in the definition of adequate instruments to promote sustainable local food systems and rural development.

CHAPTER 4

LOCAL FOOD NETWORKS IN RURAL AREAS OF PORTUGAL

CHAPTER 4.1

RURAL PORTUGAL – AN OVERVIEW

By the turn of the twentieth century, Ferrão (2002) argued about the challenges of defining 'rural Portugal' as a static and definite entity, proposing to understand it in combination with the multiple flows of people and activities over time that have shaped the Portuguese geography, both physical and human, as it is known today. For a start, what 'rural' means depends on who is asked to frame it and the moment in history when the question is posed. According to Torre and Wallet (2020), how the 'rural' is apprehended by the public policies varies from country-to-country and is associated with a particular vision of rural and its place in the national development model. The different connotations about rural areas in Portugal, although often used in uniformity and homogenously (Figueiredo, 2013), have coalesced into a fuzzy concept making it difficult for both citizens and policymakers to deal with these abstract territories. On the one hand, in the national political discourse rural areas have mainly been described as 'backward', 'underdeveloped', and 'deficient' places in need of modernisation and capacity building (Dinis, 2019). Conversely, the 'rural' has also been described as an idyllic place where one can be close to nature, enjoy a better quality of life, rest from the hectic lifestyle in cities, and reconnect with past cultural traditions (Figueiredo, 2012). These two, apparently conflicting yet intertwined, notions serve to understand the emerging issues in rural areas in Portugal today, especially regarding their connections with agricultural and food policies and long-term sustainability of these areas.

RURAL AREAS ARE NO LONGER FOOD PRODUCTION SITES

As pointed out by F.O. Baptista (1994) and discussed earlier in Chapter 3.1., soon after Portugal joined the European Union (EU), a paradigm shift in rural development in Europe brought about changes in the way Portugal approached its rural areas. We briefly revisit the historical developments in Portugal marking this transition in three phases, focusing on their relevance in redefining rural areas: i) the Land Reform period following the new democratic regime in 1974 until Portugal's accession to the EU common market; ii) a modernisation period following Portugal's entry to the EU market; iii) the shift in rural development through CAP reform promoting the multifunctionality of farms; and iv) the post-productivism period (Figure 10).

The first phase was characterised by the restructuring of the rural areas under a new social order. It was marked by land reform[6] aimed at maintaining the productivity of Portuguese agriculture, which had been characterised by a long-standing tradition of providing livelihoods to villagers employed in the primary sector. In this period, 'rural' continued to be associated with a territory to create income from food-producing activities that acted as the web of all socio-cultural activities.
The second period followed Portugal's entrance into the EU and saw a large influx of EU funds and the liberalisation of the market. The modernisation of agriculture continued to be at the centre of a productivist agricultural policy, although the State's capacity to compete against the highly efficient agricultural sector of its European counterparts fell short. In fact, the 'collective subsistence economy' characteristic of solidarity-based relationships in the rural areas was essential in supporting

[6] It does not compete this work to focus on how this tumultuous process unfolded. A good description of the sociological developments that took place in Alentejo Region during this period was done by Vester (1986).

the rural population during this period (Vester, 1986). For rural areas became increasingly less economically attractive to landless rural residents and farm workers, (seasonal) employment was sought out in more dynamic zones along the coast and abroad.

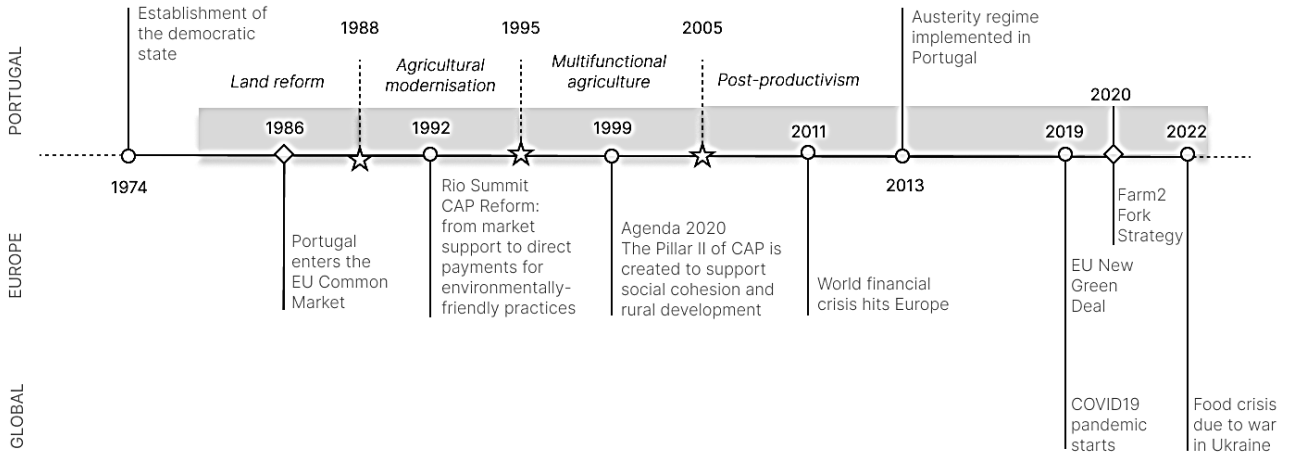

Figure 10. The evolution of the rural development approach in Portugal. Timeline of key events. (Own elaboration)

During the third period, rural areas were promoted as multifunctional places encouraged to provide other services besides food production. At this time, farming was no longer profitable thus intensive agriculture in large holdings was preferred to increase profits. The goal of this new approach was to reduce the environmental harm caused by intensive farming and to preserve the unique characteristics (natural, cultural, historic, etc.) of these areas. Those who remained employed in these areas worked in the service sector and tourism mainly.

Last comes the current period in which rural areas became fully decoupled from their 'productivist' attributes, following a place-based approach to promoting rural territories. Self-determination of local communities became a centre piece in this last period to promote rural development in the continent (e.g., the Farm2Fork Strategy as a pathway to encourage sustainable

rural communities). However, amidst the increased land abandonment and lack of economic opportunities in rural areas in Portugal, this new approach translated into preserving a romanticised agricultural past by turning rural areas into consumption sites (Figueiredo, 2013). It is during this phase that promoting rural areas as attractive and sustainable destinations became a national priority for rural development (for example through the Nature Park 2000, UNESCO programmes, heritage foods, among many others).

In conclusion, the last four decades have witnessed the transformation of rural areas in Portugal, especially in terms of sustaining human activities. Rural development efforts today continue promoting, at least in theory, the revitalisation of rural areas through other activities than farming. Therefore, Oliveira (1994) argued that the 'rural' must be understood within this complexity, as it encompasses a large set of non-agrarian ruralities.

CHAPTER 4.2

ENABLING CONDITIONS FOR LOCAL FOOD SYSTEMS TO EMERGE IN PREDOMINATELY RURAL REGIONS OF PORTUGAL – A FOOD ACCESS APPROACH[7]

ABSTRACT

Local food studies have stressed the importance of local food systems (LFS) in shortening the linkages between producers and consumers and in promoting resilient territories. Food consumption patterns are mostly studied around the rural-urban dynamics, urban food security, and the revitalisation of rural communities, but little is known about the impact of LFS over rural residents and their capacity to access local foods. This paper explores the development of LFS in rural areas, from a food access approach, by characterising the rural landscapes promoting local food consumption. From a mapping of 74 predominately rural municipalities, statistical data of six socio-economic and political variables was collected to portrait each municipality analysis and Pearson's correlation test informed about the factors enabling these networks to emerge. Three clusters were identified: '*meso-urban'*, (N=5) presenting urban-like characteristics (higher income and education levels, and reduced road infrastructure and small-scale farming); *'dense'*, (N=26) characterised by high population density, road infrastructure and small-scale farming; and *'castaway'* (N=43) with low population density, income, post-secondary education, and expenditure in RD in agriculture. LFS emergence in rural Portugal was strongly determined by the levels of mean income and education levels in rural municipalities, which brought into question concerns on rural residents' capacity to consume local foods. Low physical access, purchasing capacity, and awareness of food issues appeared to compromise the utilisation of these foods by the most socio-economically disfavoured groups. However, other territorial externalities and empirical work not included in this study could further complement our findings and provide a richer picture for the localisation of food systems in rural areas.

Keywords: local foods; territorial approach; rural landscapes; cluster analysis; food access

[7] An adapted version of this chapter has been published in Land as Hernández, P. A. (2023). "Enabling Conditions for Local Food Systems to Emerge in Predominately Rural Regions of Portugal—A Food Access Approach", 12(2) 461. Land. MDPI AG. https://doi.org/10.3390/land12020461. (Appendix 8).

INTRODUCTION

Our food systems have been transformed rapidly and differently across the globe during the last century, reflecting unsustainable ways to produce and consume food, an increased disconnection between food source and final users, and broadened social inequalities (Vorley and Lançon, 2016). The heightened urbanisation in developed societies and the concerns on these issues have prompted the re-definition of the linkages between the 'rural' and the 'urban' in renewed set of relationships known as alternative food networks (Morris and Buller, 2003; Tregear, 2011). The emergence of such networks reflects the interest of individuals in supporting farmers and rural communities, to protect endangered (local) species and varieties, while considering the well-being of consumers in urban places (Pascucci et al., 2016).

In the mid-90s, the concept of local food systems (LFS) surged to examine the transformation of rural areas, the new dynamics of the agri-food sector and the changes in food consumption (Lozano and Aguilar, 2014). Namely, LFS have been praised for counteracting the concentration of power in transnational food supply actors (Martindale et al., 2018) and empowering the primary producers as multifunctional service providers for urban and rural groups (Matacena, 2016). Local foods is a concept that arose as a 'solution' to the negative externalities associated with the globalised and industrialised food system (Eriksen, 2013), based on the principle that shortening the linkages between food production and consumption can have positive impacts in the promotion of more resilient territories (Romero-López and Ramos, 2017; El Bilali et al., 2017; Michel-Villarreal et al., 2019). Shifting food production out of the industrial model and sourcing local produce through new chains has also been deemed to contribute to community health and nutrition, small producers' livelihoods, and rural development, while tackling the environmental side-effects from input-

dependent globalised food systems (Edwards (2016) cited in Poças Ribeiro et al., 2020; Renting et al., 2003; Forssell and Lankoski, 2015; Pascucci et al., 2016).

Some authors have, despite these arguments, cautioned against the generalisation of the concept and have called for more holistic and critical approaches to examining the benefits of local food systems across different scales (Forssell and Lankoski, 2015; Matacena, 2016; Schrager, 2021). In Europe, specifically, a careful analysis of LFS must consider the implications in the shifts in social structures and power dynamics amidst the new rural development paradigm ('new rurality'), which responds to changing geopolitical food and agricultural relations (Rytkönen and Hård (2016) cited by Mastronardi et al., 2019; Goodman, 2004).

To date, LFS have largely been discussed in Europe in terms of their potential to contribute to small rural businesses and processes of rural development (Andress and Fitch, 2016), with rural producers dominating the discourse (Poças Ribeiro et al., 2020) and the latter assumed as the multifunctional providers of goods and services for urban consumers (Mastronardi et al., 2019; Matacena, 2016). This is problematic for two main reasons: i) it situates LFS as part of the "re-negotiation of the rural-urban agri-food relations, where rural areas, among other things, are required to 'work' for cities and their suburbs" (Mastronardi et al., 2019, pg.2103), leaving gaps about the impact of LFS in rural areas; and ii) the continuous adoption of a producer and urban-centred approach to discussing local foods limits insight into the capacity of consumers in non-urban territories to access these foods, and on how local food systems shape rural landscapes (Andress and Fitch, 2016).

Knowledge about the transformative capacity of LFS in non-urban geographical spaces is also not uniform across the continent, and this subject is under-researched in Portugal (Moreira and Morell, 2020; Pato, 2020; Poças Ribeiro et al., 2020). For a start, each territory holds unique rural

development traits that depend on the existing structures and financial capacities (Rytkönen, 2014). Social and political efforts for local foods in Portugal accentuated after the economic crisis of 2010-2014, within the processes toward a national strategy in favour of family farming and food security. However, these efforts have concentrated on the protection of small family farm holdings as individual agents with social and territorial functions but not necessarily highlighting their food production capacity (Calvário and Castro, 2022). Some academic debates around local foods consumption in Portugal have mainly focused on urban centres and food policy constraints (Silva et al., 2021; Moreira and Morell, 2020; Delgado, 2020).

The lack of a systemic approach to promoting local foods in Portugal hinders the capacity to recognise the real impact of these processes in rural landscapes. A starting point to fill this void is by identifying what enables the emergence of local food channels in these areas. For instance, are there territorially specific socio-economic conditions that promote or slow down local food production? Once we can point out the driving forces of this trend, it is sensible to discuss any rising concerns regarding the utilisation of local foods. This paper, thus, aims to determine the key characteristics prompting LFS in predominately rural areas in Portugal. It stands as a systemic screening of what the local food landscapes in rural areas look like, based on the assumption that LFS development presents similar trends in rural and urban areas. In other words, this article adapts the elements discussed around urban food security and transposes them into our studied rural areas, serving as a toolkit to discuss food access issues evolving from this setup.

The paper is structured as follows: First, we present the food access approach as a useful framework to analyse local foods utilisation, or said differently, from a consumer perspective. Second, we explain data sources and analytical methods used. Then we present the results and discuss our findings. And last, we provide our final remarks and suggestions for further research.

CONCEPTUAL FRAMEWORK

We start from the fact that food activities (production, processing, distribution, retail, and consumption) occur in agri-food systems composed of a set of actors and relationships with specific outcomes (Ingram, 2011). Food systems approaches emerged in response to the issues produced by the promotion of concentrated and unsustainable food production regimes, which led to the persistence of food insecurity despite increases in food yields, plus a series of social, economic, and environmental effects impacting modern societies (Delaney et al., 2018).

As any other food system, local food systems (LFS) exist in unique contexts in conjunction with other food schemes at different scales and levels. We assume the concept of local food as foodstuffs that are produced and processed in a defined geographical area, relatively close to where they are marketed and consumed (Kneafsey et al., 2013). The concept of "food geographies" (Kneafsey et al., 2021) can help unpack the mosaic of materialities, people, places, spaces, and scales within food systems. It aligns with the notion that agri-food systems are territorialised entities with complex dynamics circumscribed in a particular geographic space and coordinated by territorial governance (Rastoin, 2015). We consider that LFS are, ultimately, expressions of territorial governance comprised of new spatially bound relationships between producers and consumers through which territories can be assessed (Sanz-Cañada et al., 2018).

Andress and Fitch (Andress and Fitch, 2016) sustain the food access concept can help disentangle the interactions between the social, cultural, and physical environments in food systems to assess their impact on food provision and consumption. Food access is hereby examined by qualifying the six dimensions of access proposed by Saurman (Saurman, 2016, pg.37): accessibility,

availability, affordability, acceptability, accommodation, and awareness. These dimensions were adapted to understand the specific issues on local food consumption in rural areas.

Accessibility concerns the elements facilitating, or not, that local foods are within a reasonable proximity to the consumer, in terms of time and distance. Its relevance stems from the assumption that a weak infrastructure for food distribution in rural areas might pose challenges to maintaining high-quality produce, such as local foods, available at rural food outlets (Bardenhagen et al., 2017). *Availability* considers aspects on local food supply and demand. Specifically, it contemplates the capacity of a territory to meet the food needs of the consumers and communities served and recognises that the main contribution of local food systems is the revitalisation of local food production by (re-)connecting small producers and consumers of that locality (Cerrada-Serra et al., 2018). *Affordability* refers to the capacity that consumers hold to cover the financial costs for local foods. *Acceptability* considers the receptivity of LFS in a particular area, from both a community and a consumer food environment perspective (Caspi et al., 2012) *Accommodation* hints at the suitability and adaptability of LFS to thrive in a specific context, by looking at how well local food outlets accept and adapt to local residents' needs (i.e., store hours or types of market places), as well as the existing infrastructure for LFS to flourish. *Awareness*, last, indexes the kind and amount of knowledge that residents have about the relevance and means to purchase local foods.

METHODS

DATA COLLECTION

We used secondary data from the national mapping of local food initiatives in Portugal made by Hernández (Hernández, *submitted*). This mapping was a targeted online search carried out from November 2020-March 2021, from which we extracted the list of municipalities identified to host

local food initiatives in predominately rural areas (N=74). Predominately rural areas (PR) in Portugal correspond to the administrative and geographical units with less than 100 inhabitants per square kilometer (Esteves, 2014) For these 74 municipalities, we collected further statistical data linked to six selected socio-economic and political indicators (Appendix 9). The aim was to first find a comparative language to, then, group the municipalities in clusters based on similar characteristics.

Data source for indicators *pop_dens, income, high_edu,* and *RD_agri* were extracted from the national statistics, at the municipal and NUTS3 level, to have a socio-economic picture of each PR. NUTS3 corresponds to the European nomenclature of territorial units for statistics for small regions for specific diagnoses (NUTS, 2022). The other two indicators (*road* and *agri_profile*) were engineered. Each indicator was selected in correspondence to one of the six food access dimensions discussed above. Table 7 summarises the six indicators guiding data collection.

Accessibility | We used Sanchez-Zamora et al. (Sánchez-Zamora et al., 2014) proposed index to understand each municipality's road infrastructure (*road*), taking the total length of motorways (main and secondary) in the municipality and dividing it by the total municipality area. This index deemed relevant since residents in a rural community often have limited access to food resources because of the infrastructure available in that region (Andress and Fitch, 2016). A reduced road connecting system might impact those residents who rely on public transportation options, private vehicle usage to carry out food purchases or home food delivery, such are the economic disadvantaged, elder groups, and those living far from medium size rural cities where local food sales tend to take place (Cerrada-Serra et al., 2018).

Table 7. The socio-economic indicators considered to analyse local food access in this study (municipal level).

	Indicator	Description	References	Food access Dimension
1 **road**	road infrastructure density index	Road length (km) / Municipality area (km2) – value	Own based on Sanchez-Zamora et al. (2014) and ERM (2021)	accessibility
2 **agri_profile**	farming orientation index	Relevance of small-scale farming (UAA used by farms <5ha / UAA in municipality) – value	Own based on Rivera et al. (2020) and INE (2019)	availability
3 **income**	income per household	Gross mean income declared by fiscal household (HH) – thousand euros	INE (2018)	affordability
4 **pop_dens**	population density	Number of residents in each municipality per square meter – inh/km2	Pordata (2019)	acceptability
5 **RD_agri**	expenditure in Research and Development in agriculture	Total expenditure in Research and Development (RD) in agriculture, by NUTS3 – thousand euros	IPCTN (2020)	accommodation
6 **high_edu**	high education level	Percentage of the resident population aged 15 and over with post-secondary education - %	Pordata (2022)	awareness

Availability | We created the farming orientation index (*agri_profile*) to grasp the capacity of each region to produce local foods, based on Rivera et al. (Rivera et al., 2020) argument that increased number of small farms (assumed here as holdings < 5ha) is linked to regional food systems development. We divided the number of small farms in each municipality by the utilised agricultural area (UAA) occupied by these small farms to infer this index.

Affordability | The indicator gross mean income per household *(income)* served to determine what the purchasing capacity of residents in each municipality might be, for it is argued that wealthier consumers tend to have much greater access to a wider array of healthy and better foods, such are local foods (Weis, 2020).

Acceptability | We measured the population density (*pop_dens*) in each municipality to assess the impact range of local foods, considering the number of residents living per square meter. This

indicator was chosen to examine the argument that LFS often operate in contexts pressured by the intensification of agricultural practices and urbanisation (Beckie et al., 2012).

Accommodation | We looked at the total expenditure in Research and Development in agriculture to infer the reported investment per NUTS3 region in the agri-food sector, due to the lack of data at the municipality level. Although a more interesting indicator for this paper could be the expenditure in innovation, this data was not retrievable statistically for this sector specifically. Therefore, we take the indicator expenditure in research and development in agriculture (*RD_agri*) to gauge the development of local food production systems, considering that the sector should prioritise a transition towards sustainable food systems in Europe (Galli et al., 2018).

Awareness | We look at the percentage of the resident population aged 15 and over with post-secondary education (*high_edu*) to determine the mean literacy level of the population in each municipality. This variable is relevant as raised interest and sensibility about local food issues, available through awareness campaigns, food events and media platforms, can contribute to the internalised food-specific values needed for consumers to purchase local foods (Cembalo et al., 2015). For instance, Hashem et al. (Hashem et al., 2018) discovered that consumers' awareness of the safety risks linked with pesticide use in agriculture and the industrial food system was related with consumers' interest in buying local foods. This is likely perhaps increased knowledge and information goes together with a degree of competency and willingness to read food labels and ask food-related questions.

DATA ANALYSIS

We used the IBM SPSS Statistics Software (v.28) to run a one-tailed Pearson correlation test to measure the linear relationship between our selected continuous variables (Table 9). The objective was to detect whether these socio-economic aspects were related to one another, or not, to explain the emergence of initiatives prompting local foods consumption. Correlation coefficients *(R)* were deemed significant at the 0.05 and 0.01 level for each relationship. For positive correlations we assumed the two variables increased or decreased together in the same direction; whereas negative correlations implied that the relationship between variables went in opposite direction (namely, when one increased, the other decreased, and vice-versa).

For clustering the sample, we used an Excel free template for cluster analysis intended for research and data mining (Cluster Analysis 4 Marketing, 2022), which helped us organise our data in three segments. Cluster structure and set of correlations were further analysed and discussed through the lens of the six dimensions of access proposed by Saurman (Saurman, 2016, pg.37): accessibility, availability, affordability, acceptability, accommodation, and awareness, based on Andress and Fitch (Andress and Fitch, 2016) food access approach.

RESULTS

From the diversity across the country, three clusters of rural regions prompting local food consumption were identified. Table 8 contains the summary of the mean values of these three clusters. Cluster A (‘*meso-urban’*, N=5, 7% in sample) corresponded to the smallest group and included municipalities with urban-like characteristics (e.g. largest income per HH, highest education level, an average population density, the weakest road infrastructure, and hardly any

small-scale farming). Cluster B *('dense'*, N=26, 35% in sample) included the municipalities with the highest population density, road infrastructure, proportion of small-scale farming, and the largest expenditure in research and development of agriculture, a lower-than-average income per household, and a somewhat medium percentage of the sample attaining high education.

Cluster C was the largest cluster (*'castaway'*, N=43, 58% in sample), and was characterised by low densely populated municipalities, the lowest mean incomes, bottommost education levels and expenditure in RD in the agri-food sector, and a shallow road infrastructure and number of small-scale farms.

Table 8. Mean values of the six indicators collected for all PR municipalities by cluster.

Cluster	Nº. of municipalities	Percentage in sample	pop_dens	income	high_edu	RD_agri	road	agri_profile
Cluster A 'meso-urban'	5	6.8	40.1	19079	19.95	2832	0.32	0.04
Cluster B 'dense'	26	35.1	69.2	14335	12.01	3509	0.66	0.37
Cluster C 'castaway'	43	58.1	23.2	13978	10.78	2674	0.38	0.27
TOTAL	74	100%						
AVERAGE			40.5	14448	11.83	2978	0.47	0.29

We observed a particular geographic distribution of the 74 municipalities in the sample across the country, according to the three clusters (see Figure 11). For a start, most PR municipalities were in mainland Portugal (N=73) except for one in the Autonomous Region of the Azores, in Faial Island. Municipalities in Cluster A characterised by either hosting a small city or by being nearby an urban centre, which could explain the high income and education levels and the limited presence of small farms in this group. A good example of this phenomenon is the municipality of Santiago do Cacém in NUTS2 Alentejo that neighbors Portugal's second largest port, Sines. Differently, most

municipalities in Cluster B were in the northern part of Portugal (in NUTS2 Centro and Norte), apart from two: São Brás de Alportel in the South (NUTS2 Algarve) and Horta in one of the insular regions (NUTS2 Autonomous Region of the Azores). The characteristics and clear geographical location of the members in this cluster were not surprising, as small farms and a higher population density are predominant in northern Portugal.

Cluster C was the largest group and occurred transversally across the country, but especially in remote and inland areas close to Spain along Portugal's northern and eastern borders. Municipalities in this subgroup belonged to NUTS2 Alentejo (N=10), Algarve (N=3), Centro (N=17), and Norte (N=13), in areas lagging economically and demographically. Remoteness might help explain the low population density, literacy level, and income levels, as well as the meagre presence of small farms and expenditure in the development of the agricultural sector in the municipalities of this cluster.

Six correlations (four positive and two negative) emerged in our analysis. Their correlation coefficients informed the intensity of these associations. Most correlations were weak (closer to 0), one was somewhat moderate, and another was strong (closer to 1). We present them below in decreasing order, based on the degree of relationship between the two variables.

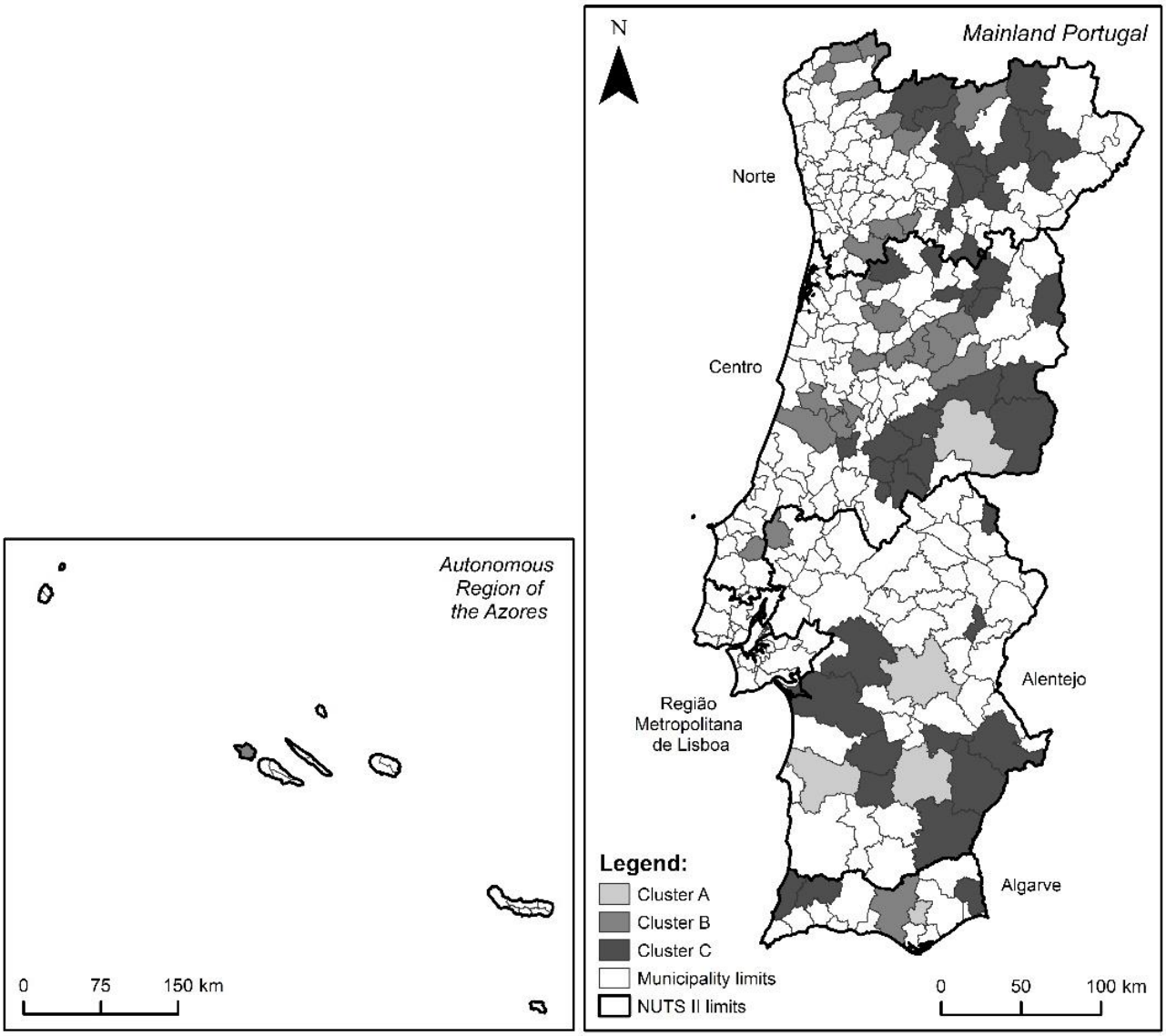

Figure 11. Geographical distribution of rural municipalities in the sample according to the three clusters. (Own elaboration)
(Note: The Autonomous Region of Madeira is purposely not included in this graph, as it contained no PR municipalities in our sample).

(1) *income – high_edu* (*R*=0.806): This strong correlation informs that if mean income values increase, so do high education levels (and vice-versa). In our sample this translates to municipalities hosting LFS initiatives with similar income and education levels. Cluster A presented the highest mean values for these two variables, indicating that municipalities labelled as 'meso-urban' were characteristic of having higher incomes in tandem with higher

levels of education. In opposite, these two variables had directly proportional low values in Cluster C, where municipalities had low income and low education levels in cluster 'castaway'.

(2) *road – pop_dens* (*R*=0.422): A somewhat moderate relationship emerged between variables road infrastructure and population density in our sample, meaning that the two variables behaved similarly sometimes. Cluster B showed the highest mean values for both indicators, from which we can infer that more densely populated municipalities often consisted of a better road infrastructure. However, this connection was not akin in clusters 'meso-urban' and 'castaway'.

(3) *road – agri_profile* (*R*=0.299): a weaker positive correlation between these two variables appeared in our sample, with both indicators increasing and decreasing in tandem. Unlike the item above, Cluster B held the highest values for the two variables, whereas Cluster A had the lowest. This implies that municipalities labelled 'dense' were well connected through the road system and had a high presence of small farms in their territory, when compared to the other two clusters. Municipalities named 'meso-urban' were, in opposition, poorly connected and held a meagre percentage of land used for small farming.

(4) *income – road* (*R*= -0.217): This negative correlation was not straightforward but hints at a weak probability that if the mean income of a municipality increases, its road infrastructure is likely to be poor (and vice-versa). This is true for Cluster A, where municipalities had higher incomes but low road infrastructure indexes. Clusters B and C showed the opposite trend. Municipalities with medium level incomes had well developed road infrastructure systems (Cluster B), whereas municipalities in Cluster C with the lowest mean income values had a less-than-average road infrastructure index.

(5) *RD_agri – agri_profile* (*R*= -0.215): The linearity of the relationship between these two variables was weak, but hints at the opposite behaviour of one variable in comparison to the other. Clusters A and C informed that the weight of the expenditure in RD in agriculture and the presence of small farms were not uniform, but somewhat opposite. On the other hand, municipalities in Cluster B ('dense') were characterised by having both the highest values of expenditure in the sector and of small farms. This signalled the likelihood that if the investment of a region in Research and Development in agriculture is high, the number of small food farms would also increase.

(6) *pop_dens – high_edu* (*R*=0.200): The positive relationship found between population density and education levels was weak yet informed us that they could behave similarly. Cluster 'castaway' showed a clear linearity, with municipalities having populations densely low and a meagre post-secondary education attendance. Differently, Clusters A and B related the other way around, where the fraction of the population attaining post-secondary education increased in medium size municipalities (Cluster A) but was lower in locations more densely populated (Cluster B). Although this correlation is not a straightforward trend, one thing was clear: low densely populated regions tended to hold a lower number of residents with post-secondary education.

Last, we measured the weight of each variable across all correlations, based on the correlation coefficient of each pairing. In sum, we discovered that variables reveal different degrees of relevance, as follows (in decreasing order): *income* (1.023), *high_edu* (1.006), *road* (0.938), *pop_dens* (0.622), *agri_profile* (0.514) and *RD_agri* (0.215). Table 9 presents these results, considering all correlation values in positive to compare the recurrence of each aspect.

Variables *income, high_edu* and *road* stood out in association with other variables across all correlations. This means that these aspects, or more so than the other socio-economic indicators, were significant in the sampled municipalities. From this we infer that *income, high_edu* and *road* played a relevant role in enabling municipalities to host local food initiatives. This comes as no surprise, for the strongest correlation was identified between gross mean income and post-secondary education levels (*income – high_edu*) and a weak correlation was visible between income and the road infrastructure index of each municipality (*income – road*). The role of the existing transportation infrastructure deemed relevant too, especially in relation to the demographic pressures in the sample (*pop_dens – road*) and the relevance of small farm production in the municipality (*road – agri_profile*).

Table 9. Relevance of the analytical variables according to the correlation coefficients.
(Note: Values with (*) correspond to the negative correlations that were turn into positive values to facilitate comparison).

	pop_dens	income	high_edu	RD_agri	road	agri_profile	SUM
pop_dens			0.200		0.422		0.622
income			0.806		0.217*		1.023
high_edu	0.200	0.806					1.006
RD_agri						0.215*	0.215
road	0.422	0.217*				0.299	0.938
agri_profile				0.215*	0.299		0.514

Next in significance came population density (*pop_dens*) and relevance of small farm food production in the municipality (*agri_profile*). To finalise emerged the expenditure in Research and Development in agriculture (*RD_agri*), which, despite including values at the NUTS3 region instead

of at the municipality level, signalled its weak association with the relevance of small farms in the region (*RD_agri – agri_profile).*

DISCUSSION

The three set of clusters identified in our study served to organise the municipalities and shed light to three distinct profiles of territories promoting local food systems in rural municipalities of Portugal. This setup presented interesting geographical trends and six significant correlations among the socio-economic and political variables that were considered. This section discusses the impact of such combination of factors on local food access in these regions, from a consumer perspective, guided by the six food access dimensions proposed in our conceptual framework (Table 7). It focuses on the relevance of the variables identified in our results (Table 9), which we assume could help us discuss what conditions might be enabling and/or hindering the emergence of LFS in our sample.

Following the trends among the urban counterparts, our findings informed three aspects were key characteristics of the rural municipalities promoting local foods in Portugal: consumers' purchasing capacity (*income*), consumers' knowledge and sensibility on food issues (*high_edu*), and consumers' easiness to commute (*road*). It is important to stress that none of these aspects can be taken in isolation, but instead are part of a bigger setup composing the intrinsic dynamics of each studied territory. Indicators such were the potential market niche for local foods (*pop_dens*), relevance of food production by small farms in the area (*agri_profile*), and expenditure in research and development in agriculture (*RD_agri*) had less of an impact in determining the three clusters.

However, all are discussed together in this section, as they can impact food access. Figure 12 shows visually the relevance of the 6 variables, based on the correlations identified in Table 9.

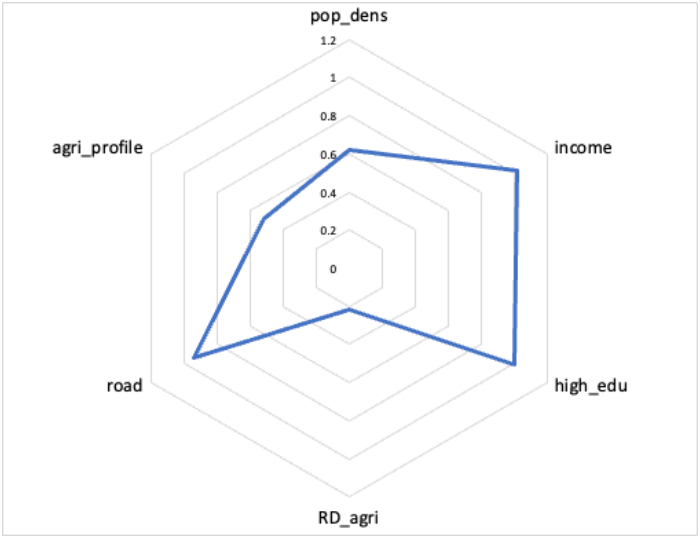

Figure 12. Relevance of the socio-economic variables considered to analyse rural municipalities in sample, based on the sum of the correlation coefficients. (Own elaboration)

CONSUMERS' PURCHASING CAPACITY

Reasonable prices of local food products have been argued to be important for consumers (Mastronardi et al., 2019) as well as a key factor determining the viability of local food systems (Matacena, 2016). Municipalities in cluster 'meso-urban' presented the highest mean income values, or, said differently, had an economic advantage to afford more expensive items, such are often local foods. This condition can be favourable for small food businesses and small producers selling to nearby residents and be an enhancer to the formation of local food networks. The fact that clusters 'dense' and 'castaway' consisted of residents with lower purchasing capacity could be informing two things. First, the economic sustainability of small producers selling locally could be compromised, because producers might resolve to selling in niche markets elsewhere for better

returns (e.g., urban centres). Second, only residents with the financial means might be able to afford buying local foods, even if this implies sourcing from somewhere else.

On the one hand, the allocation of funding to supporting alternative forms of producing and consuming food in territories with a low-income population requires creativity. For instance, finding ways to help producers supply local markets could help reduce food production costs for prices to remain affordable for all consumers. This entails shifting the specific resources to help new channels to emerge and be sustained, which could be a challenge harder to overcome in municipalities of Cluster C ('castaway') characterised by having both the lowest income and expenditure in RD in agriculture. Besides this, efforts must take a systemic approach that contemplates the easiness to reach local foods and societal improvement, as affordability does not only refer to food prices but also to people's perceptions of worth relative to food cost (Andress and Fitch, 2016). Here, one more aspect must be considered: educating consumers about food issues, which sheds light to the strongest correlation in our analysis (*income – high_edu).* From our results we discovered that municipalities in cluster 'castaway' might be resourcing to additional means to promote LFS other than residents' literacy and purchasing capacity, as these values came up to be the lowest. By this we do not imply that access to knowledge about local foods takes place solely in post-secondary institutions, but that citizens with a greater portfolio of information are more likely to be more sensible to asking questions and seeking answers.

On the other hand, our findings confirmed that gross mean income is a key indicator for measuring local food consumption in rural areas of Portugal. Cluster 'meso-urban' consisted of municipalities with high-income residents, informing us that local food initiatives in this cluster benefited of this niche market and/or that small food producers can have greater returns in these municipalities. Despite the farming orientation (*agri_profile*) of Cluster A did not show to particularly

favour small food producers, the presence of wealthy residents in these municipalities allowed us to speculate two things: First, the local food production output in these municipalities is either very high in response to demographic pressures (Yacamán Ochoa et al., 2020); or two, a secondary sector might be relevant for adding value to locally produced foodstuffs.

Results sustained that clustering was primarily formed by means of economic wealth, supporting Brinkley's argument that farms involved in direct marketing are more prone to be in areas with high median home values (Brinkley, 2017, pg.315). Similarly, the restriction to purchase high valued foods has a direct effect on the opportunity of lower income consumers – largely situated in Cluster 'castaway' – to consume these high-quality products. Due to the low purchasing capacity in this cluster, municipalities might also lack the chance to develop LFS that accompany production, processing, distribution and retailing processes, proving what Forssell and Lankoski (Forssell and Lankoski, 2015) argue to be a shortcoming of local foods.

CONSUMERS' KNOWLEDGE AND SENSIBILITY ON FOOD ISSUES

From the correlation test we run, we discovered there was a strong connection between gross mean income and post-secondary education levels in our sample. Local foods consumption in municipalities with higher incomes also had better educated populations, in what we assigned as 'meso-urban' sites. According to Anderson (Anderson, 2016), higher educational levels tend to favour awareness and support of initiatives that challenge the mainstream food system.

The reduced number of residents with higher education in clusters 'dense' and 'castaway' could reflect the limited role of consumers in these territories to demand alternative food choices. "Awareness is more than knowing that a service exists, it is understanding and using that knowledge" (Saurman, 2016, pg.138). The lower percentage of residents attaining post-secondary

education in clusters B and C suggests that residents in these municipalities might be missing the chance to consume local foods because of their limited awareness about local foods and where they can be purchased or attained. In other words, awareness is the outcome of food literacy (the set of information to which residents are exposed to) that is 'content and context specific' and the result of effective communication. Social media has become an efficient information tool for local food business promotion in urban cities in Portugal (Figueiredo et al., 2022), enabling the democratisation of information access. However, social media's role in informing consumers about food quality and production methods is mostly a private endeavour (meaning that is largely done by businesses to communicate with customers) and access to such channels might be limited in rural areas due to restrictions on internet access and digital literacy.

Efforts to counteract the reduced levels of food literacy often stem from the role of local actors in stimulating the procurement of local foods, but aspects such is population pressure might play a significant role. In practice, densely populated territories often equate to being heterogenous and more democratic, because diverse narratives regarding access to resources, participation, identity, etc. can congregate and give room to finding solutions and developing alternatives (Fladvad, 2019). Our analysis showed a weak positive correlation between population density and percentage of residents attaining post-secondary education (*pop_dens – high_edu).* From our study we infer that the denser the population is, the more likely it is better informed about food issues, and vice-versa. Cluster C confirmed this trend, hosting the least populated municipalities and the lowest percentage of the population with high education. This condition could jeopardise the development of a more diverse food system that contemplates local foods venues and a viable dietary option.

HOW EASY CAN CONSUMERS REACH LOCAL FOODS VIA MARKET CHANNELS?

We understand accessibility in terms of the geographic location of the food supply and the physical ease of consumers for getting to that location (Andress and Fitch, 2016). From our results we deduced that the most densely populated municipalities had also a well-developed road infrastructure (Cluster B, 'dense'), with a less clear trend in clusters A and C. Notions of physical and temporal proximity in municipalities of Cluster B might help explain this linkage. One the one hand, local foods are mostly exchanged through direct markets that benefit from the spatial density and proximity concept typical in localised food systems (Sanz-Cañada and Muchnik 2016, pg.3), for instance, if a market is within walking distance. On the other hand, proximity can be measured in terms of travelling time for consumers to reach local food venues. Andress and Fitch (Andress and Fitch, 2016) argue that individuals with their own transportation often have a significantly easier time shopping, especially for high quality foods. A well-developed road system implies that roads connect adequately the territory, but also that transportation facilities (could) exist to grant access to certain services for residents without their own vehicle.

Hinrichs (2000) had already cautioned that rural populations are especially burdened by a greater variation in spatial access to grocery stores, leading them to focus on facilitating access to "exclusive products and exclusive customers" (cited in Eriksen, 2013, pg.301). This trend could weigh against the opportunity of low income, rural populations to affordably access the means to eat locally produced foods (Andress and Fitch, 2016). Food access in rural communities must, however, be considered carefully, as it can be understood in relation to 'relative rurality' (McEachern and Warnaby (2006, p.198), cited in Marshall et al., 2018).

Wenzing and Gruchmann (2018) argued that demographic characteristics might influence consumer perceptions and preferences for local food (cited in Mastronardi et al., 2019). In other

words, if residents perceive that local foods are at an acceptable 'distance', either physical or temporal, the higher chance for them to select them as food options. Additionally, the short distance between consumers and their food source helps preserve local foods' inherent attributes, such as flavour, authenticity, and cultural or territorial identity, attributes that tend to be lost in long food supply chains (Romero-López and Ramos, 2017; Sanz-Cañada and Muchnik, 2016).

Making local foods available through territorially adequate channels can reduce social and territorial disparities, decrease transport costs in remote areas, increase territorial cohesion, and bring consumers closer to their food source (Kompil et al., 2019). However, aspects such as local food demand and institutional support in each specific territory must be considered to make these services viable for all citizens.

Discussing local foods availability requires considering the overall supply of local foods determined by production, distribution, and retail processes, as well as the interlinked relationships among these activities (Paul et al., 2019). Our results indicated that municipalities in cluster 'dense' have a better road infrastructure and hold a larger number of small-scale farmers, compared to the other two clusters. We assume, therefore, that such municipalities have a larger capacity to supply local foods, since small farms account for a higher share of [local food] production in regions with higher population density (Rivera et al., 2020). This larger capacity to produce local foods could be explained by the converging pressure that densely populated territories have on landholding, which can prompt the development of local food production (Yacamán Ochoa et al., 2020).

The positive relationship recognised in 'dense' municipalities between physical proximity (enabled through a well-developed road infrastructure) and food availability (a greater number of small food producers) could hint at a greater offer of local foods. The weaker link of these two variables in clusters 'meso-urban' and 'castaway' could be informing of an opposite trend. This is

because a limited infrastructure for food distribution (e.g., roads, storage, frequency of delivery) in rural areas might pose limitations to maintaining local food produce available at rural food outlets (Bardenhagen et al., 2017). The lowest percentage of small farms and road infrastructure system in 'meso-urban' municipalities could be explained through the diversification and strong market-oriented service sector that these regions have been able to forge over time. Referred to as „consumption countryside", the evolution in these territories could allow them nowadays to participate in advanced industrial networks and advanced economic markets (Copus et al., 2011) thus relying less in primary sector activities.

By the same token, disbursement for Research and Development for the promotion of local foods can play a key role in expanding local food production and enhance business and employment opportunities in the agri-food system (Lever et al., 2019) with trickle-down effect in the community at large. Our results showed a weak negative relationship between expenditure in RD in agriculture and the weight of small farms in the municipalities of our sample. This might index a contradictory signal regarding public support and local food production, especially in Clusters A ('meso-urban') and C ('castaway'), because the lack of a suitable framework that promotes local food production can hinder the capacity of the territory to accommodate its needs (e.g., increased rural food security) and goals (e.g., a more competitive small food production sector).

Cluster 'dense' presented the highest expenditure in the sector along with the highest presence of small farms, which could hypothetically be explained by a higher demand of local foods (*pop_density*), as well as the easiness to connect small food production to end users (*road*) that are characteristic in denser municipalities of northern Portugal. The higher public investment in research and development in agriculture in Cluster 'dense' can be an indication of these municipalities being better suited to develop and adapt the infrastructures that can promote local

foods consumption. Similarly, fund allocation to increase food literacy (e.g. via policy tools, research efforts, capacity building, and awareness campaigns, etc.) can empower consumers (provide the 'knowhow') and promote initiatives ('social devices') to increase consumer awareness for purchasing locally grown food products (Pascucci et al., 2016; Matacena, 2016).

CONCLUSIONS

To date, most academic debates on local food issues have focused on the evolution of alternative food systems as tools to reconnect small producers and urban consumers, to revitalise the countryside, as well as to promote urban food security. Knowledge about the transformative capacity of these systems in non-urban geographical spaces and the consumption of local foods by rural residents is under-researched in Europe and Portugal (Moreira and Morell, 2020; Pato, 2020; Poças Ribeiro et al., 2020). To fill this void, this paper sought to identify what aspects enable the emergence of local food channels in 74 predominately rural areas of Portugal, considering key territorially specific socio-economic and political conditions that can affect the promotion of local food production. Through a statistical analysis of these aspects at the municipal level, we discovered sectoral trends and driving forces. Findings facilitated the discussion of rising concerns regarding the utilisation of local foods by residents in rural areas, through the adoption of the food access approach by Andress and Fitch (Andress and Fitch, 2016) with the guidance of the six dimensions of food access suggested by Saurman (Saurman, 2016).

This study was pertinent to examine what might prompt the emergence of local food systems in rural areas in Portugal and served as a proposed theoretical 'toolkit', or framework, to discuss

what might be enabling or hindering consumption of local foods in such areas. The idea was to pinpoint the national trends in the agri-food sector, but it did not attempt to be generalised. Our findings showed that specific territorial conditions help define three distinct clusters of predominately rural municipalities promoting local foods consumption in Portugal: 'meso-urban', 'dense', and 'castaway'. Aspects gross mean income and percentage of residents attaining post-secondary education showed to be directly linked in determining cluster formation, although the relationship between the population density and the road infrastructure index of municipalities proofed to be determinant in enabling the accessibility to and availability of local foods.

The diversity of rural landscapes enabling LFS emergence could partially be explained through the three sets of characteristics identified in this study; however, they described what might be on the ground and, thus, must be confirmed empirically. For instance, the hypotheses risen from our findings on the capacity (or difficulty) to produce local foods and/or for residents to demand these items need to be assessed and quantified. Interviewing residents in one or more of the municipalities analysed in this study would provide knowledge from a consumer perspective and help identify other aspects affecting consumer decision making processes and perspectives on local foods.

Similarly, we argue that other variables could help further knowledge on the drivers for local food initiatives emergence in these areas and could be explored in future research, such are non-national funding sources and internal factors (e.g., entrepreneurship capacity, foreign investment, cross-border relationships, etc.). For this latter, we encourage exploring specific case studies to attain in-depth knowledge.

CHAPTER 5

LOCAL FOOD SYSTEMS FROM A CONSUMER PERSPECTIVE – THREE PORTUGUESE CASE STUDIES

CHAPTER 5.1

PRESENTATION OF THE CASE STUDIES

Three case studies were selected to exemplify what local food consumption looks like and means for residents in the Portuguese rurality. These municipalities (Évora, Mértola and Arouca) are predominately rural areas (PR) with low population density (see Chapter 4 for more details) that represent three distinct geographical and cultural rural landscapes within the national territory. Table 10 presents a socio-economic portrait of the three municipalities, showing selected indicators regarding population and agricultural land use changes, as well as the economic profile of each municipality. These statistics will be informative for understanding the issues observed during fieldwork, especially when it comes down to the role of small-scale and family farming and their relevance in contributing to the food needs of local residents.

Some of the critical and rapid changes that Portugal underwent through after joining the EU, already described in Chapter 3.1., are perceived in the statistics above. Take for instance the striking changes regarding the use of agricultural areas (UAA). While there is a noticeable decrease in arable land and family vegetable garden areas across all case studies, except in Arouca which presents a positive balance of family vegetable gardens, a substantial increase of area is allocated for permanent crops, again except in Arouca, and permanent pastures. These changes reflect the effective implementation of CAP policies to make the agricultural sector more competitive through the intensification of food production (e.g., via the use of agricultural areas for permanent crops like fruit and nut trees and livestock production that benefits from increased pastured areas).

Table 10. Portrait of the three case studies according to selected indicators.

(Note: UAA=utilised agricultural area. GAV=Gross Added Value. HORECA=Hotel, restaurant, and catering services. *Data from 2019. **Data from 2020).

Indicator	Year	Unit	Évora	Mértola	Arouca
Area of municipality	2022	km²	1307.1	1292.9	329.1
Resident population	2022	No.	53625.0	6175.0	20903.0
Old-age dependency ratio	2022	No.	38.20	66.50	39.60
Population change; annual	2022	%	-0.0048	-0.0120	-0.0066
Average farm size	2019	ha	101.70	129.90	5.10
Percentage of farm holdings 0-5ha	2019	%	40.7	11.2	89.0
Changes in UAA for arable land	1989-2019	%	-71.9	-46.4	-62.8
Changes in UAA for family vegetable garden	1989-2019	%	-74.0	-80.0	62.2
Changes in UAA for permanent crops	1989-2019	%	150.7	878.9	-46.2
Changes in UAA for permanent pastures	1989-2019	%	321.0	73.5	382.3
UAA changes in holdings 0-5ha	1989-2019	%	-36.4	-70.6	-62.3
Proportion of agricultural holdings with organic production (%)	2019	%	3.9	1.8	0.5
Relative contribution of agriculture to total GAV (%)	2021	%	4.2	9.6	6.5*
Relative contribution of HORECA to total GAV (%)	2021	%	5.8	17.7	3.9
Main sector with largest relative contribution to total Gross Added Value (%)	2021	%	Manufacturing industries	Wholesale and retail	Manufacturing industries
			30.06**	27.05	38.25
Proportion of Natura 2000 Network area	2021	%	17.1	60.5	46.9
Guests in tourist accommodation establishments	2022	No.	359542	29520	20587

Despite tourism being one of the engines of the Portuguese economy, representing 8.2% of the Gross Domestic Product (Rolha and Figueira, 2020), the tourism sector (HORECA) in these three municipalities showed meagre significance in contributing to their economy. This fact comes as no surprise given that rural municipalities do not belong to the stereotypical touristic destinations that

rural tourism in Portugal is characterised for (Eusebio et al. 2017), namely the attractiveness from traditional sun and beach or urban destinations. This trend was confirmed during fieldwork, as the Local Food Networks referred to by consumers with some linkage to tourism were found in Mértola, which presents the highest contribution of the HORECA sector of all three case studies (Table 10).

ÉVORA

Évora is the predominately rural (PR) municipality representing Cluster A, the set of municipalities categorised 'meso-urban' in Chapter 4 (see Table 8). Évora is situated in the southern territory of the country in the middle of the NUT2 region Alentejo, about 1.5 hours from the country's capital, Lisbon. Évora is comprised of 12 parishes distributed across 1307.08 km^2 (Figure 13), a territory characterised by its rolling hills and silvo-pastoral forests, hot summers, and wet and mild winters, and extensive areas used mostly for permanent crop production and shepherding. From the clustering done for PR municipalities, we learned that Évora has an average population density, a very low percentage of small farms, a relatively weak road infrastructure, a below average expenditure in Research and Development in agriculture, and a population with relatively high purchasing capacity and high literacy levels.

The municipality of Évora is hub for services to the Alentejo region, providing many public services to the nearby communities, including two hospitals, 5 institutions of high education, 3 museums, and other regional administration services. Since 1986, the municipality is home to the UNESCO's World Heritage City Évora, which attracts visitors from all the world to see the historic Neolithic, Roman, Medieval and Renaissance sites, as well as to appreciate its immaterial cultural heritage.

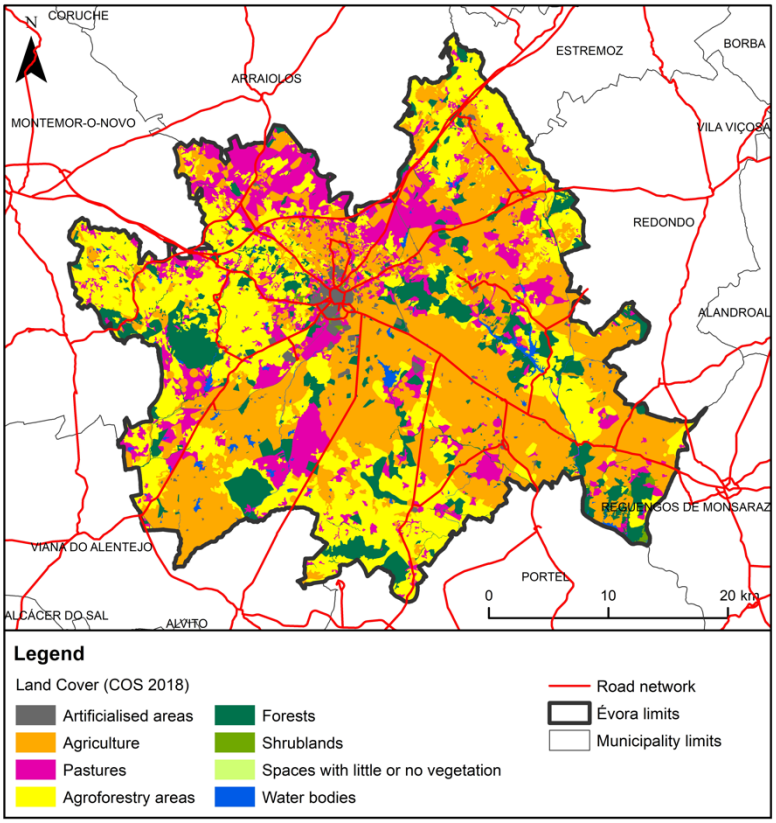

Figure 13. Land cover map of Évora, using COS (2018) and ERM (2021). (Own elaboration)

Gastronomy plays an important role still today in the Alentejo culture, exhibiting people's linkage to their landscape, from farming to hunting, to eating at taverns and restaurants. Salvado et al., (2018) describes how the Alentejo region has been a place to grow food for the cities since the Roman times, given romans' favouring for city settlements to organise the Roman Empire. Bread, for instance, was the romans' main food staple, with a 'mother dough' made with olive oil and honey. Nowadays, the bread made in the Alentejo region is a reference of national gastronomy (DGDR, 2001) that is part of people's everyday food. The Alentejo was considered the 'cereal belt' during the New State period during the Salazar's military dictatorship from 1933-1974, growing most of the wheat to satisfy the nation's need.

The landscape of the NUTS2 region Alentejo has changed drastically since the beginning of the 21st century with the building of the Alqueva Dam, a water reservoir fed from the Guadiana River in Spain. The dam has favoured intensive farming practices of permanent crops like olive groves, wine grapes and almond trees, tomatoes for the canning industry, and large pasture areas for cattle farming. The Alqueva Dam was built in 2004 with trickle-down effects in the economic development of the region, and, consequently, of Évora. Along with increased industrial farming, rural tourism activities have benefited from the dam's construction, including rural gastronomy and tourism (Almeida, 2019).

MÉRTOLA

Mértola is the predominately rural (PR) municipality depicting Cluster C, which contains the set of municipalities categorised 'castaway' in Chapter 4 (see Table 8). Although it is also located in NUTS2 Alentejo, Mértola represents the 'southern' picture of the region, unlike Évora that is in the centre, with a predominately Mediterranean climate characterised by dry and hot summers, and mild winters with little rain. Mértola's landscape is characterised by two zones: the flatland areas with poor and shallow soils and the Guadiana River Valley with hilly forests, yet the river has diminished in volume in the last decades. A large portion of the municipality is part of the Natural Park Vale do Guadiana, which is a natural protected area offering a wide portfolio of touristic activities, including hiking, bird watching, star gazing and canoeing, etc. (Rolha and Figueira, 2020).

Trading has been one of Mértola's main economic activities for its privileged position on the Guadiana River. Initially a Roman port, Mértola gains dynamism later in the eighth century as the most western port in the Mediterranean under the Arabic dominance. It was only in the 20th century

that mining gained importance in the municipality's GDP with the Mina de São Domingos. However, the boom lasted briefly and after the closure of the mine in 1965 the municipality underwent a spike fall in population. Despite neighboring with Spain, the municipality of Mértola has kept a weak connection with Spain, with whom earlier smuggled goods.

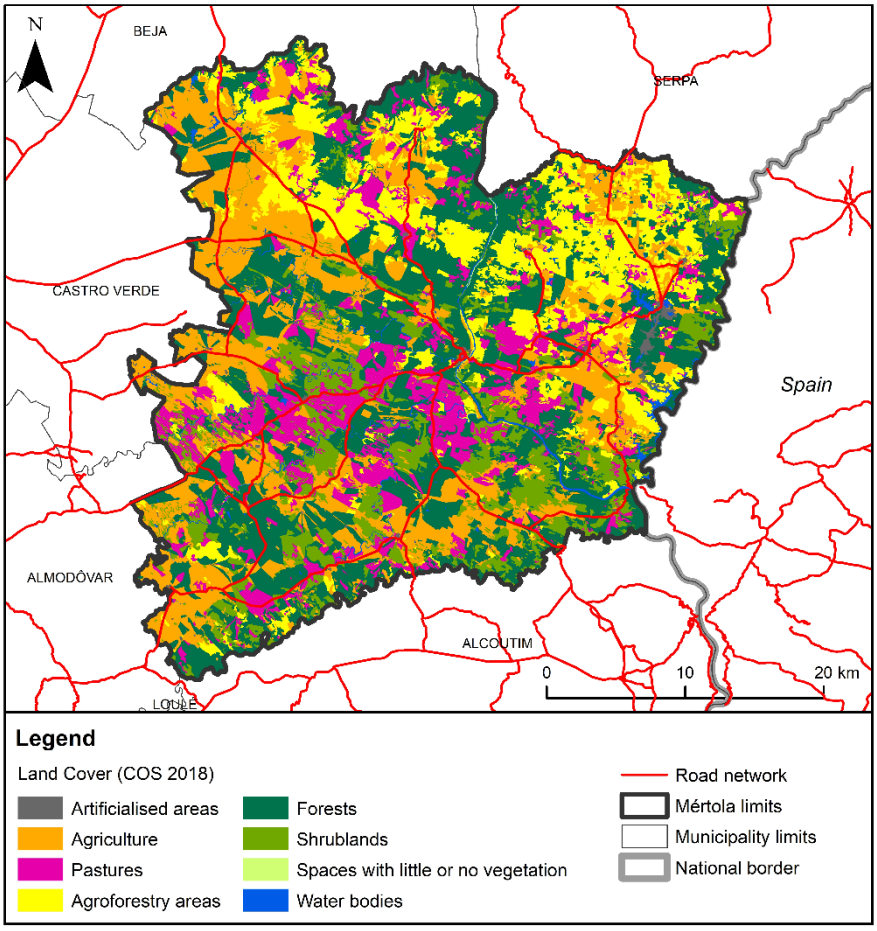

Figure 14. Land cover map of Mértola, using COS (2018) and ERM (2021). (Own elaboration)

Differently, Mértola presents a close relationship with its southern neighboring region, Algarve, with historically established commercial routes that connect the municipality to the Atlantic coast. This proximity with the municipalities that are south and west of Mértola was evident during fieldwork, especially with Almodôvar, Castro Verde and Alcoutim, which provision a large part of

fresh fruits and vegetables, and seafood to Mértola. Flow of goods were also identified with Beja in the north, the closest urban centre to Mértola.

From the comparative statistics (Table 10), we learned that Mértola is characterised by a concentration of land used for agriculture, with an average farm size of 130ha. Today, the municipality's UAA focuses on permanent crops and permanent pastures, which have increased exponentially in the last 30 years in 800% and 73%, respectively. During the same period, the area used for vegetable family gardens has reduced 80% and the number of agricultural holdings below 5ha presents a negative balance of 70%. Against this background, it is not surprising that Mértola, as part of Cluster 'castaway', is a municipality characterised by very low population density and percentage of small farms, weak road infrastructure, and the lowest expenditure in Research and Development in agriculture, purchasing capacity, and literacy levels, when compared to the other two clusters.

Mértola has been investing in promoting tourism to counteract the forementioned territorial handicaps, focusing its strategy on highlighting the archeological sites, natural and ethnographic heritage, and protecting the autochthonous species that the municipality is home to. Nevertheless, Ferrão et al. (2023) warn about the vulnerabilities identified in the NUTS3 region Baixo Alentejo, where Mértola is situated, given its heavy reliance on income from activities exclusively deriving from the tourism sector, as well as those export-based, or that are linked to the real estate and construction sectors.

AROUCA

Arouca is the predominately rural (PR) municipality depicting Cluster B, which contains the set of municipalities classified as 'dense' in Chapter 4 (see Table 8). Arouca is localised in the most northern region of Portugal, NUT2 Norte, known for its small and family farm tradition (89% of all farm sizes and an average farm size of 5.1ha, according to INE, 2022) and for reporting the highest financial support in the country for this type of farming (Canaveiro et al. 2022).

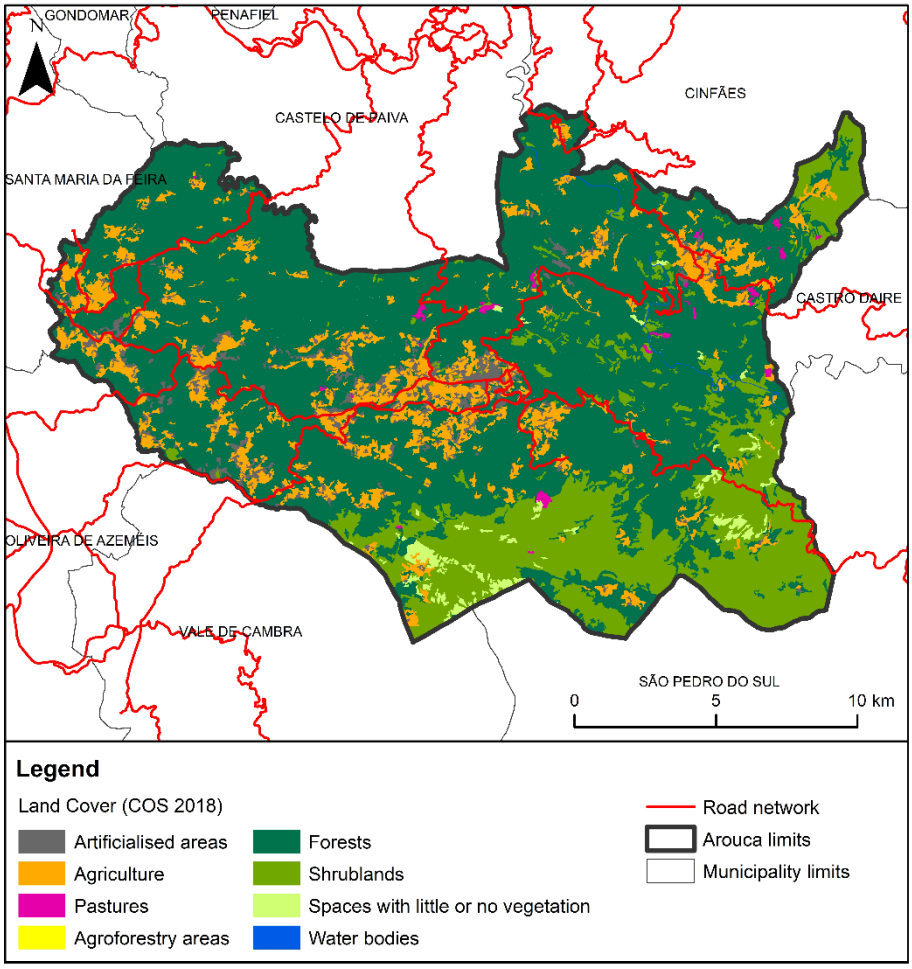

Figure 15. Land cover map of Arouca, using COS (2018) and ERM (2021). (Own elaboration)

Unlike the other two case studies, Arouca was the only municipality presenting a positive balance of 62% of vegetable family gardens yet an increase in permanent pastures of 382% in the last 30 years (Table 10). Despite this, the agricultural sector did not come up as a significant source of income for the municipality, and proportion of land used for organic agriculture was the lowest of the three cases, with 0.45%.

Arouca was the smallest municipality from the three case studies selected, covering an area of 329 km^2, although densely populated and organised in 16 parishes. This comes as no surprise for Arouca is a municipality with a very fragmented landscape that sits on the Douro River basin. The territory of Arouca can be best described in terms of the Douro tributaries that contour medium-sized mountains and give shape to the revealing valleys where the population sits dispersedly. The municipality's weather is dry, sunny, and lukewarm in the Summer, while the Winter is rainy and fresh. Eucalyptus forests have been planted recently over a large portion of Arouca's surface, with incidence mostly on the west and central part of the municipality, homogenising the ecology for native fauna and flora.

Arouca presents a closer cultural, historical, and economic affinity to the Norte region despite bordering the Centro region in the south. Precisely, Arouca is part of the NUTS3 region Area Metropolitana de Porto, where Oporto, the second biggest city in Portugal, is located west of Arouca. It is common for residents to commute on the weekends back to Arouca from their weekly workplaces either in or close to Oporto. The flow of goods and people and access to urban amenities are, thus, facilitated thanks to an advanced road infrastructure characteristic of municipalities in Cluster 'dense'. Residents in Arouca tend to live in small houses surrounded by a small plot of land, and terrace farming on hill slopes is typical of the scenery of this region in northern Portugal.

The Geopark Arouca, part of UNESCO's European Geoparks Network, is a protected area recognised internationally by its exceptional geological heritage covering the surface of the municipality. Nowadays, Geopark Arouca is central to the territorial development strategy of Arouca aimed at protecting, revitalising, and sustainably using the natural, ecological, historical, archeological, cultural, and touristic resources offered by it. The mountain range Serra da Freita within the Geopark Arouca borders, for example, sits on the southern part of the municipality and is a popular destination for hiking, nature tourism and extreme-sports activities alike.

CHAPTER 5.2

FIELDWORK RESULTS

INTRODUCTION

In the realm of sustainable food systems, the concept of local foods has sparked widespread interest and discussion. However, despite its prominence in academic circles, an agreed-upon definition of local foods remains elusive. Scholars, such as Tregear (2011), have extensively explored local foods, raising concerns about relying on abstract theoretical assumptions. Notably, the discourse surrounding local food networks (LFN) has predominantly centered on the assumed positive benefits, often overlooking nuanced aspects. Previous studies, particularly those examining urban residents, have explored consumers' participation in local food networks, inadvertently sidelining other consumer segments and territorial specificities.

This research landscape has raised pertinent questions about the broader implications of local food consumption. Specifically, much of the existing literature has concentrated on the advantages derived from heightened local food production and product valorisation through consumer support. Unfortunately, this focus has resulted in a neglect of crucial consumption-related issues, including matters of social justice, as underscored by Goodman (2004). Moreover, there is a pressing need to adopt a territorial perspective, viewing local food networks as a combination of elements that define a particular territory, as suggested by Reina-Usuga et al. (2018).

Local food consumption in rural areas is a significant aspect of both cultural heritage and sustainable living in these areas. Understanding the nuanced meanings attached to 'local food,' the consumption patterns and perceptions of rural residents, and the social dynamics driving this trend is essential for fostering sustainable agricultural practices, community well-being and rural development. This chapter aims to delve deep into these dimensions to unravel the complexities of local food consumption in rural communities.

We start by highlighting the importance of understanding what ‘local food’ means for rural residents. Developing a common language can help explore the multifaceted meanings and cultural significance of 'local food' within rural communities, elucidating the diverse interpretations and values associated with locally sourced produce. Second, it will be important to identify what rural residents’ patterns and perceptions of local food consumption are. Investigating the dietary patterns, preferences, and attitudes of rural residents towards local food can be instrumental for identifying the factors influencing their choices and understanding the cultural, economic, and environmental motivations behind local food consumption. A third aspect entails examining the social dynamics and concerns of local food consumption in these areas. For instance, what are the social dynamics enabling local food consumption in rural areas? What concerns might rise from this? We consider the social networks, traditions, and community dynamics fostering local food consumption in these areas while critically examining the challenges and concerns emerging from this trend, including economic implications, environmental sustainability, and disparities in access.

The research carried out in this chapter employs a mixed-methods approach, combining qualitative and quantitative research methods. Qualitative methods such as in-depth interviews, informal conversations, and participatory observations were used to understand the social dynamics enabling local food consumption. Surveys and quantitative analyses were conducted to identify

consumption patterns and perceptions among rural residents. Data triangulation was used to ensure the reliability and validity of the findings.

The chapter is structured as follows. It begins by detailing the research methods employed, outlining the techniques, tools, and approach used to gather and process data effectively. Subsequently, we present the results, featuring the specific outcomes obtained from the conducted case studies. These findings are critically examined in the discussion section, providing insights into their implications on the utilisation of local foods by residents residing in rural areas. The chapter culminates with a conclusion, which summarises the key findings, their relevance to the research questions, and potential areas for further exploration.

METHODOLOGY

FIELD DATA COLLECTION

Fieldwork was carried out solely by the main researcher in February, March, and April of 2023 in three purposefully selected predominately rural (PR) municipalities of Portugal: Évora, Mértola and Arouca. The three municipalities (‘concelho’ in Portuguese) were chosen as one emblematic example for each of the clusters identified in Chapter 4. The clustering was based on the cross-comparison of specific socio-economic and political variables across 74 predominately rural (PR) municipalities that were identified to promote Local Food Networks (LFN) in Portugal, according to the initial sampling of national initiatives elaborated in Chapter 3. Clustering also served to examine the potentiality of municipalities in each cluster type to make local foods available to nearby consumers through LFN. We opted for carrying out fieldwork at this scale because municipality is a

manageable size for studying social phenomena, in terms of demographics and local administration. Municipality is also the smallest administrative unit to which we can have reliable statistical data.

Each one of the case studies were selected because they had the highest number of Local Food Networks (LFN) of the cluster. Évora was selected from its cluster for being the largest rural city in inland Portugal. Mértola was chosen due to its remoteness and profile as a 'southern' municipality beside the Algarve region. Differently, Arouca was chosen because it is located in northern Portugal, a zone largely identified with the practice of small and family farming. Table 11 shows the criteria behind the selection of the three case studies.

Table 11. The three case studies explored in this study.

Municipality	Cluster	Selection criteria	NUTS
Évora	'meso-urban'	Largest rural city in inland Portugal	NUT2 Alentejo (central)
Mértola	'castaway'	Remoteness and a 'southern' municipality beside the Algarve region, sharing its border with Spain	NUT2 Alentejo (south)
Arouca	'dense'	Located in northern Portugal; represents well a different context regarding small-scale food production	NUTS2 Norte

One to three weeks were consecutively spent at each location to collect data *in-situ* and *a posteriori* through follow-up conversations by phone or via video call. Fieldwork methods prioritised covering residents from all parishes ('freguesias' in Portuguese) of each municipality. This allowed to see the diversity of the landscape and to cover the entire territory. Data collection relied on multiple methods and sources, in what is often referred to as 'triangulation' (Patton, 1999). Data triangulation is used in social science research to surpass the limitation of using a single method (e.g., biases by respondents when responding to surveys), but also to include multiple perspectives

from actors across the food system. Four methods were used during fieldwork: consumer survey, semi-structured interviews to representatives of Local Food initiatives, informal conversations with community members, and participatory observation at events. Table 12 show the distribution of the sample according to the data collection methods.

Table 12. Number of participants per data collection method, by municipality.

Data collection method	Évora	Mértola	Arouca	Total
Survey	16	14	15	45
Interview	3	4	8	15
Informal conversation	2	4	4	10
Participatory observation	1	1	0	2
Total	22	23	27	72

Consumer survey

A 15-minute survey was done to residents of each case study site to inquire about their local food consumption habits. Prior to using the survey, a pilot test was done using a Google Form free template among colleagues at the University of Évora. The goal of this pilot was to test the tool, measure the survey's length, and refine the questions to make them clearer, based on our research questions. Initially, we considered using an online survey to collect as many responses as possible, so the survey was created using the online free tool Survey Planet (Survey Planet, 2023) and the access link was shared with the City Hall communications department of each municipality to aid with dissemination. From the three municipalities, we collected 32 responses online (Arouca), but only 5 were randomly selected and considered for analysis in this municipality.

The survey was done in Portuguese language and comprised of 30 questions in total (Appendix 10). The first question asked for the consent of participation. The rest was divided in three sections: 6 questions about the residents' socio-demographic characteristics, 15 questions on consumers' behaviour, and 8 questions to assess the political dimension of the local food system. Sampling was done purposefully to guarantee geographical distribution and socio-cultural diversity (e.g., gender balance, diverse ages and backgrounds). A consent form (Appendix 11) was given to each respondent informing about the study. Printed pamphlets of the survey were also distributed at local food shops, upon authorisation from owners, and collected a few days later. The only requirement for survey participation was that the person resided in one of the municipalities selected as a case study. Surveying stopped once saturation of answers was clear in each municipality. In total, 48 surveys were collected, 45 of which were valid. The reason for invalidation was that respondents lived outside of the municipality's boundary. Respondents showed interest and collaborated cheerfully during the survey that in many cases extended up to 30 minutes because they often talked about their life stories and told anecdotes. Appendix 10 includes the questionnaire done to residents and the variables considered behind each question used for data collection.

Semi-structured interviews to representatives of local food initiatives

The goal of carrying out interviews to representatives of initiatives distributing and/or selling local food was to include the perspective of the actors in other processes in local food systems beside consumption. Selection was initially guided by the first mapping of national initiatives presented in Chapter 3, but it eventually expanded to cover mostly ventures identified locally during fieldwork. Selected initiatives were either specific retailers pointed out by respondents or vendors discovered in villages, who represented some of the forms through which consumers access local foods, as

mentioned by consumers in the survey (e.g., food truck, fish vendor, itinerant bread delivery van, etc.). Upon selection of each initiative, contact by phone, by email, or in person was done to confirm willingness to participate and arrange a time and hour for the interview.

A total of 15 semi-structured interviews were carried out in the three municipalities. Most were done in person (14) and one was done online via Zoom, a free software for scheduling online video calls. Some preparatory work about the initiative's history and background was done beforehand using online resources, in cases when the interview was planned beforehand. Interviews lasted 20 to 90 minutes, about 1 hour in average, and took place at the location of the initiative. Consent forms (11) were delivered prior to beginning the interview. Interviews were characterised for avoiding intrusiveness and offering a friendly environment for respondents to partake. Against this backdrop, no voice recording was used to reduce transcript time and to avoid any negative pre-disposition or bias by the respondent against the interview. Instead, note taking of responses and quotes were done simultaneously and pictures were taken before, during and after the interview once permission was granted. Similarly, no interview script was shared beforehand to leave room for adaptation of the questions. Fixed questions used during the interview included initiatives' origins, operability, funding resources, as well as motivations, plans in the future, and main challenges. Flexible questions inquired about specific issues raised during the interview, like food certification, labour force and the initiative's long-term sustainability, among others.

Informal conversations with community members

Ten informal conversations were held with members from the three case study sites. Conversations mostly included residents of the studied municipalities except for one occasion, where the person worked there doing food delivery but resided in a nearby municipality. Interactions

corresponded to spontaneous conversations on food-related issues and rural development to infer residents' perspective. The 10 instances considered in this method included talks with one or more people at once (e.g., a conversation with village residents sitting outside somebody's home, or a talk with a staff member at a visitor's tourism centre, etc.). Note taking *in-situ* was not done to provide a sense of casualness and avoid any possible perceived hierarchisation by the respondent during the conversation, although notes were registered *a posteriori*. Themes covered during the interaction varied in range, from producers' market functioning, tourism development, observed demographic and landscape changes in the last decades, to legal aspects behind local food sales, etc.

Participatory observation

Participatory observation was done at 2 events that celebrated local food to a certain degree, although differently. The first corresponded to the board member meeting of one of the initiatives identified in the initial sample of Local Food Networks (LFN) presented in Chapter 3. Number two was a monthly food fair in a town of one of the studied municipalities. Data collection methods were adapted to each event. Beforehand, permission to participate in the board meeting was requested to the meeting organisers. The meeting lasted about 2 hours and participants were informed in the beginning about the presence and neutral role of the observer. Notes were taken about the main issues discussed during the meeting, including the definition of a strategy to pursuit continuation of the LFN amidst growing challenges. The second event required less formality, occurred in the town's fairground in the open air, and lasted nearly 1.5 hours. Data collection consisted of a thorough exploration by foot of the fair, photographic recording, and two shopping interactions. Notes about key observations were recorded *a posteriori* right after leaving the fair.

DATA ANALYSIS

To build a consumer profile, we relied on the understanding that respondents had of the local food concept. All responses to Question 8 were categorised in three clusters describing the abstract concepts that residents had over local food (N=117). These words were analysed using open coding methods according to Strauss and Corbin (1998). Open coding, a technique for microanalysing qualitative data, was employed to organize the words into broad themes or conceptual categories. This analysis resulted in the identification of clusters based on in-vivo codes mentioned by respondents as well as an original code.

Secondly, three consumer types were determined using data from Question 10, which asked about rural residents' main sources for local foods. Respondents often cited multiple sources, leading to the classification of responses into three distinct clusters: bystander (acquiring local food through non-market means, including self-production or as gifts), eager (purchasing local food), and willing (consumers willing to pay for local foods if not acquired through other means).

Lastly, the consumer preferences for local food variables were developed based on responses to Question 16, which inquired about the most important characteristics when acquiring local foods. Answers were reorganised following the framework proposed by Rytknönnen et al. (2018), which includes four groups of attributes sought in local foods: intrinsic and extrinsic product qualities, post-modern and environmental aspects, geographical, territorial, and socio-cultural factors, and local and rural development considerations.

A food systems graph was designed to visualise the social dynamics facilitating local food consumption in rural areas, as identified in the case studies (Figure 16). The graph was fed mostly by the information gathered from the semi-structured interviews and complemented or confirmed with the data collected through the consumer survey, informal conversations, and participatory

observation. The flows were established through a triangulation of collected data. Building the graph involved three steps: interview transcription, data analysis, and design. First, interview responses (N=15) were recorded in 'semi-transcript form' in English by the main researcher, instead of being transcribed *in verbatum,* as it is commonly done in social science research. Then, a form of enabling circulation of local food in the system was given to each entry in 5 different groups (no market, integrated, home-grown, artisanal, and undifferentiated). These systems were understood according to the food system processes (Ericksen, 2007) being activated by actors in the municipality to promote local food consumption (Table 13).

Whenever it applied, personal quotes from the semi-structured interviews were included in the recording of data, following a direct translation into English by the main researcher. Direct quotes were used to exemplify some of the issues raised during the interview. Last, a Local Food Consumption Systems map (Figure 16) was built by adapting a PowerPoint template developed within the SALSA project for the analysis of regional food systems (Rivera et al., 2020).

Table 13. Food systems and processes enabling the circulation of local foods.

	Local Food System	Production	Processing	Distribution	Consumption
1	No market	x			x
2	Integrated	x	x	x	x
3	Home-grown	x		x	
4	Artisanal		x	x	x
5	Undifferentiated			x	x

RESULTS

Results presented in this section are the triangulation of the multiple data sources described in Table 12, taking the survey done to rural residents as a base to support our findings given our focus on adopting a consumer-centred approach. It takes a comparative stance to all three case studies, highlighting those issues that emerged as outstanding and helpful to describe the territorial differences.

SOCIO-ECONOMIC CHARACTERISATION OF THE SAMPLE

The consumer survey was done to 45 residents in the three case studies: 16 in Évora, 14 in Mértola and 15 in Arouca. As sampling was done purposefully, the sample was almost equally distributed in terms of gender and age (Table 14). However, clear differences were found in aspects that can have an impact on people's material means, lifestyle choice, and interests. Two thirds of the respondents reported to be employed, almost one quarter of the sample had completed the minimum education level, and more than half of the respondents had no dependents.

In fact, almost everyone surveyed affirmed consuming local foods in one way or another (2 out of 45 said they did not). Consumption of local foods was reported to occur at different frequency rates and quantities. For example, 21 reported that 25% of their diet included local foods, 17 declared 25-50%, and 5 reported that 50-75% of their food was local. Respondents informed that they acquired these foods using multiple methods, often relying on self-production in home gardens, other times relying on food purchases, or exchanging them with neighbors.

Table 14. Socio-demographic characteristics of the survey sample, by municipality.

		Évora	Mértola	Arouca	Total
Total		16	14	15	45
Gender	Female	9	9	7	25
	Male	7	5	8	20
Age	20-34 years	4	3	3	10
	35-49 years	3	4	4	11
	50-64 years	8	3	5	16
	65 years <	1	4	3	8
Professional status	student	1	0	0	1
	employee	8	11	11	30
	unemployed	5	1	0	6
	retired	2	2	4	8
Education Level	Cycle 1	2	5	3	10
	Cycle 2	3	1	0	4
	Cycle 3	1	0	4	5
	High school	7	6	5	18
	Graduate	3	2	3	8
Household size	0 dependents	12	10	7	29
	1 dependent	2	3	3	8
	2 dependents	1	0	2	3
	3 dependents	1	1	2	4
	3< dependents	0	0	1	1

When inquiring people about whether they participated or not in any food purchasing/exchange food (*"Do you have any form of regular arrangement with one or more local producers to buy food from in exchange for money or work?")*, six responded affirmatively, and 39 did not. This informed that people preferred unstructured, already-existing channels to acquire local foods. As expected, we found in our sample that residents acquired local foods through Local Food Networks referred to as 'fixed' types in Chapter 3. Examples given were food fair, farmers' market, food shop, restaurant, etc. Non-market channels used for this purpose included receiving from

relatives or friends, and food trails. Most respondents affirmed having a network of people in the community with whom they discuss food issues regularly (27 out of 45).

The types of Local Food Networks most mentioned by respondents included food fairs, farmers' markets, and food shops. No reference to box schemes or online food shopping was provided, for instance LFN labelled 'versatile' like the PROVE scheme, as described in Chapter 3. From fieldwork, it was made clear that no agreed concept existed for 'local food'. Instead, its meaning oscillated between routinary and familiarity, and the concept was for everyone to define based on their personal values.

LOCAL FOOD CONSUMPTION PATTERNS

Survey respondents hinted at similarities and differences when consuming local. Three aspects helped construct a typology of consumption patterns: people's definition of local food, method to acquire local foods, and people's preferences for local food.

Definitions of 'local food'

From the survey, we learned that no common understanding for 'local food' existed, and that people's definitions of the term did not necessarily coincide with those registered in the literature on local food consumption. Instead, its meaning oscillated between routinary and familiarity, and the concept was for everyone to define based on their personal experiences and values, like found in the United Kingdom by Truninger and Day (2013).

Three definition clusters emerged from the categorisation of the 117 words used by respondents to describe 'local food'. Granting the freedom to respondents to come up with words that best described the term was useful to gain their personal insight and grasp some of the

collective imaginaries. These local food definition clusters organise the shared notions that rural residents had over this food type in 3 distinct groups (Table 15): 'from the land'; 'from here', and 'the usual'. They reveal the various kinds of 'local food', as defined by the residents themselves.

Table 15. The three definition clusters of words describing 'local food'.

Cluster No.	Definition cluster	Characteristics in sample
1	'from the land' '*da terra'* in Portuguese in-vivo code 29.7% in sample	Local food is associated with the 'how' of food production, referring often to the methods used. Examples included concepts like *organic, traditional, produced at home, natural, own, vegetable garden, safety*, etc. Terms used to qualify food or make a judgement of it, such as *good, healthy, quality, not fried, fresh*, etc. also belong here.
2	'from here' '*daqui'* in Portuguese in-vivo code 18.6% in sample	Local food is understood as something that happens somewhere. This cluster includes the 'where' food is, with 'I' as the point of reference. Concepts in this category included *zero-kilometres, produced in this zone, from the region, where one lives, existing in the region, close to me, produced in the municipality, producers' market, proximity, Évora, special to each area*, etc. This group also includes words hinting at the item's availability timeframe, which is strongly linked to a place or space. Examples include *in season, seasonal, and availability*.
3	'the usual' '*o de costume'* in Portuguese original code 51.7% in sample	Local food is described as something that is familiar, is part a routine, and grants a sense of comfort. It includes familiar things and faces, "the habitus" of Bourdieu (*things from home, daily routine, ours*, *daily routine*, *street vendors* and *the fish vendor,* etc.) However, most of the words referred to 'everyday foodstuffs' or items that are commonly part of people's diet (e.g., *bread, meat, milk, cheese, sausages, legumes, coriander*, etc.)

From the 117 descriptions given by survey respondents about 'local food', none referred to luxury items or indicated that these foods should be attained in speciality shops or that should hold any certification label (e.g., denomination of origin[8]). Instead, local foods were associated with modes of doing (values, cluster 1), physical proximity (location, cluster 2) and familiarity (habits, cluster 3).

[8] Local foods with certification of origin came up only through other data collection methods, beside consumer survey.

Consumer types

Three types of consumers of local foods were identified from our case studies, based on the method used to acquire local foods. Methods included acquiring them via self-production, through gifts or exchanges, or by purchasing them. The three types were labelled *bystander*, *eager*, and *willing*, respectively (Table 16).

Table 16. The three types of local food consumers found in fieldwork.

Cluster No.	Consumer type	Characteristics in sample
1	'bystander' 31.1% in sample	consumes local foods from non-market channels. In this case, local foods were either self-produced, given from relatives and friends through informal exchanges, or simply avoided. Socio-demographically, members in this cluster were mostly male; had the lowest percentage of unemployment; was the most educated group; had most of dependents per household; occurred largely in Arouca; and expenditure in food purchasing was the highest, when compared to the other 2 clusters.
2	'eager' 31.1% in sample	consumes local foods in exchange for money exclusively, independently of whether they have entered the market through short, medium, or large food supply chains. From a socio-demographic perspective, this group was characterised by having the largest number of female and youngest respondents; it consisted of the largest number of people declared unemployed and held the smallest percentage of members with the lowest education level. Interestingly, this cluster was equally distributed in all 3 municipalities.
3	'willing' 37.8% in sample	corresponds to a consumer ready to purchase local foods, shall these not be produced in their own garden or received from relatives or friends. Socio-demographically, this group had an equal gender ratio, yet it contained the oldest and largest number of people retired. Nevertheless, education levels appeared to be heterogenous, presenting both the biggest group with the lowest education level and the largest percentage of members with university degree. This cluster was largest in Évora.

Consumers' preferences for local food

Across all case studies (Évora, Arouca and Mértola), rural residents appeared to look for similar characteristics when acquiring local foods. In general, the most looked upon attribute in local foods by respondents was the product's intrinsic and extrinsic attributes, that could be perceived through the senses (e.g., taste, appearance, smell) or appreciated through abstract notions (for instance, perceptions that it is good or brings health). Extrinsic aspects corresponded to characteristics

outside the product, including package type, product certification, price, etc. Despite being the most relevant attribute across all clusters, its weight across the municipalities varied. From all the answers given per municipality, intrinsic and extrinsic attributes were most relevant in Arouca (83%), followed by Évora (71%), and, last, Mértola (57%).

Therefore, to analyse respondents' preferences for local food we considered the second most prominent attribute looked after by consumers.

Table 17. Territorial differences of consumers in our case studies, considering the descriptive three variables (local food definition, consumer type, and preferences for local food).

variables	LF definition			Consumer types			Preferences		
categories	from the land	from here	the usual	bystander	eager	willing	post-modern and environmental	geographical, territorial, and socio-cultural	local and rural development
Évora	2	5	9						
Mértola	4	4	6						
Arouca	8	3	4						
Évora				3	5	8			
Mértola				3	5	6			
Arouca				8	4	3			
Évora							8.85	13.27	6.70
Mértola							7.63	15.24	5.12
Arouca							11.05	5.52	0.00

The second most relevant attribute per region, and its proportion in the sample, was territorially specific (*geographical, territorial, and socio-cultural*). In Évora, residents looked also for local foods with attributes around cultural heritage, food culture, and cultural landscape. In general,

respondents in Évora looked for items linked to a place and with the socio-cultural specificities behind it, values that align with the municipality's focus on food gastronomy as a strategy to promote tourism. In Mértola and Arouca, differently, respondents looked also for attributes in food beyond the market dynamics (*post-modern and environmental attributes*), for instance its effect on the environment (e.g., produced using environmentally-friendly farming techniques). Reasons behind this might be the fact that a natural park, and subsequently the nature-related activities associated with these protected areas, is central in both municipalities, as exposed in the previous section 5.1. Additionally, values searched for by residents included those that promoted new food relationships around trust (e.g., knowing the producer, or food traceability to its origin). The weight of this category was higher in Arouca (11%) than in Mértola (7%), likely because of the larger reliance on small family farming in the former municipality. Table 17 presents the territorial differences among case studies, considering the three variables: local food definition, consumer type, and preferences for local food.

LOCAL FOOD CONSUMPTION SYSTEMS IN CASE STUDIES

This section considers the findings from the interviews, informal conversations, and participatory observation events. We confirmed that rural residents adopted different methods for acquiring local foods, based on their understanding of what these foods are (local food definition). These methods are not exclusive but flexible and complementary. They could be revised and updated, as well as new ones might emerge.

From our findings, we discovered that there are at last five versions of consuming local foods. Their characteristics depend on which of the four processes in food systems they partake

(production, processing, distribution – including marketing and retailing, and consumption) (Ingram, 2011). These versions, which we call here Local Food Consumption Systems, occur simultaneously across all three case studies and are useful to understand the different flows (activities) and nodes (relationships among actors) that enable local food consumption.

1. **No market:** the product is either produced for self-consumption, traded by someone for something, or gifted among community members without any monetary exchange. Activities take place at the farm household by its members and concern the production of the raw material and making it consumable (i.e., using home-style food processing techniques like fruit jams, home-made wine, meat curing, etc.). Examples include: sheep shepherd (M), vegetable garden (E,M,A).

2. **Integrated:** this type includes activities along all four processes. Actors from the same municipality control all activities encompassing the production, transformation or preservation of raw products – if applicable, and distribution of food until it reaches the consumer. In these systems, farm activities are controlled as a business and processes are monitored from the beginning to the end. Examples from the sample include: small producer at farmers' market (E), a cheese factory (E,M), a local food coffee shop (M), a local food cooperative (A).

3. **Home-grown:** in this type, actors control the production of raw materials but must outsource processing activities in a nearby municipality, due to a lack of services at the operation site. After undergoing processing, food may or may not return to the same system to be distributed in the

municipality and consumed by residents. If the processed food item does not return, it is exported to another municipality[9], which activates other relationships with actors in those places. Examples include organic olive oil (E), winery (M), butcher shops (A), restaurants (E,M,A).

4. **Artisanal:** refers to activities concerned about adding value to the raw product and securing a place in the market until it is consumed by residents in the municipality. In this type, the raw material is outsourced – from outside of the regional, and sometimes national, boundaries, so activities involved actors at that level. Emphasis here is given to the technique of food processing (e.g., the recipe, or the 'know-how'), and not so much on raw material's production methods or location. Examples from the sample are the bakeries (E,M,A), candy maker (M), fish truck (A).

5. **Undifferentiated:** Undifferentiated: this type concerns the distribution of foods until they are consumed by residents in the municipality. Therefore, activities involve actors in the retailing of food until it reaches end users. Food production techniques are not relevant in this type, but also attributes like convenience and price. Examples from sample: food truck (M), convenience shop and supermarket (E,M,A).

The different forms of food systems enabling local food consumption in our case studies are shown in Figure 16.

[9] If exported, it can enter other food system in another municipality becoming a different type, either 'artisanal' or 'undifferentiated'.

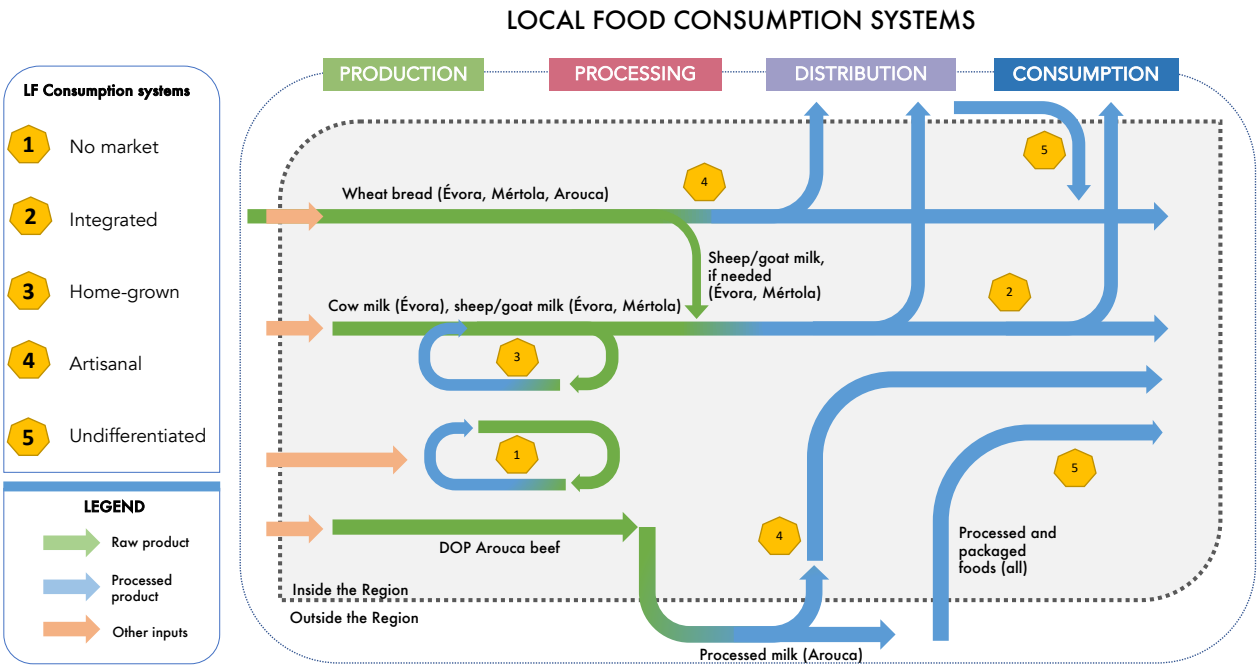

Figure 16. Map of the flows and nodes enabling local food consumption, as reported in the case studies. (Own elaboration)

From the sample, we learned that the five local food system types occurred differently across our municipalities (Table 18). The sample hints at where processes are working ('flowing'), including the actors behind those processes and the types of relationships among them. In Évora, we identified that 3 systems were 'integrated', 2 were 'artisanal', and 1 was 'undifferentiated'. In Mértola, 5 were 'undifferentiated', 3 were 'artisanal' and 1 was 'integrated'. In Arouca, all local food systems were found, 4 were 'home-grown', 3 were 'undifferentiated', 2 were 'integrated', and 1 each were 'no market' and 'artisanal'.

Table 18. Local food system flows by data source, according to the sample.

Note: (*) indicates that two interviews referred to the same local food system, showing therefore 2 instead of 3.

	Évora						Mértola						Arouca					
Local Food System flows	**1**	**2**	**3**	**4**	**5**	**All**	**1**	**2**	**3**	**4**	**5**	**All**	**1**	**2**	**3**	**4**	**5**	**All**
Interview		2		1		3		1		2	1	4		2*	2	1	2	7
Informal conversation				1	1	2				1	3	4	1		2		1	4
Participatory observation		1				1					1	1						0
Total		3		2	1	6		1		3	5	9	1	2	4	1	3	11

DISCUSSION

For each of the municipalities studied, we were able to identify a type of consumption pattern and a set of local food systems maps. What territorial specificities (e.g., territorial characteristics mentioned earlier in Chapter 5.1.) might explain the identified patterns and systems of local food consumption is the purpose of this section.

Our findings informed that local foods in the municipality of Évora circulate mainly in integrated, artisanal, and undifferentiated systems. We argue that the integration of food processes in Évora might be the consequence in the increase of farm holding size and pasture areas in the last 30 years, benefiting large-scale cattle farming activities for milk production and cheese making. Cheese is a food typicity in the region and some brands opt for certification, while others do not due to costs and unperceived benefits. Artisanal systems thrive, in the meantime, because consumers understand local foods as a form of making food (category 'from the land'), with an emphasis on the know-how, the techniques holding the cultural identities and traditions from a specific place. Activities promoting local gastronomy, rural tourism, and territorialised foods in the manufacturing

and HORECA sectors promote the manufacturing of local foods such as bread, cheese, pastries. Undifferentiated local food systems were expected as these flows transport food that is usually cheaper and easily available for consumers socio-economically in disadvantage.

Mértola presented mostly undifferentiated local food systems, which came as no surprise given the reduction of area used to for agricultural food crops (71% in the last 30 years). During fieldwork, respondents showed concern about not having people producing food and the inability of finding local food produced in the municipality, as the population is severely aged and reduced. This phenomenon can also help explain why the most relevant consumer type in Mértola is 'willing'. Artisanal food systems provide the foods that people are used to having on a day-to-day basis ('the usual' according to our definition clusters), through which people nourish relationships based on trust and familiarity. Integrated systems were also visible in Mértola. We argue that these systems benefit from role of the HORECA sector, with tourism as an important economic contributor in the municipality, to promote such traditional and artisan foods.

Arouca presented all local food system types, but with an inclination toward systems with actors controlling food production and processing. This can be explained due to the large proportion of farms below 5 ha (89%) and very small average farm size (5.10ha), when compared to the other two cases. Value was given to knowing how to produce good food ('from the land'), especially food that is of good quality. In fact, residents in Arouca were characterised by producing food for themselves or for acquiring local foods through non-market channels. The search of attributes linked to protecting the environment could be justified considering that the municipality focuses on the promotion of Arouca based on the natural qualities within it through the Geopark Arouca Project, which benefits from the 46% of the municipality's territory being categorised as a Natura 2000 protected area.

CONCLUSIONS

In summary, our survey uncovered a diverse landscape of perspectives and practices surrounding 'local food,' highlighting the absence of a standardised definition. Instead, we observed a fluid interpretation oscillating between routine and familiarity. This variability was evident in the emergence of three distinct definition clusters: 'from the land,' 'from here,' and 'the usual.' These clusters illuminated the multifaceted nature of 'local food,' revealing the individualised definitions crafted by rural residents themselves.

Additionally, our study identified three types of local food consumers: bystander, eager, and willing, categorised based on the methods employed to acquire local foods—via self-production, gifts/exchanges, or purchases. The significance of the product's intrinsic and extrinsic attributes stood out, encompassing sensory perceptions like taste and abstract notions such as quality or health. Although universally important, the weight of these attributes varied across regions, with Arouca residents attributing the highest value (83%), followed by Évora (71%), and Mértola (57%).

Moreover, territorial specificity emerged as the second most crucial attribute. In Évora, cultural heritage, food culture, and cultural landscape were emphasized, highlighting the socio-cultural and geographical dimensions. Interestingly, in Mértola and Arouca, respondents sought attributes beyond market dynamics, including post-modern and environmental factors, reflecting concerns about the environment and fostering trust in food relationships. Arouca placed higher emphasis (11%) on these factors compared to Mértola (7%).

Our findings affirmed the diversity in methods for acquiring local foods, which were adaptable and complementary, suggesting a need for ongoing revision and adaptation. Furthermore, we identified five distinct versions of local food consumption, determined by the four food system processes

(production, processing, distribution, and consumption). These versions, termed Local Food Consumption Systems, were consistent across the three case studies, offering valuable insights into the intricate flows and relationships underpinning local food consumption.

In conclusion, our study not only underscored the complexity of 'local food' but also illuminated the dynamic interplay between definitions, consumer behaviours, and the broader food system processes. These insights provided a nuanced understanding of local food dynamics, essential for policymakers, researchers, and stakeholders aiming to support and enhance local food initiatives tailored to the diverse needs and preferences of communities. By addressing these research questions, this chapter contributed with valuable insights to the fields of sociology of consumption, sustainable agriculture, and community development.

Furthering research should be oriented toward the development of ground-based knowledge about what territorially specific strategies can increase local food consumption, namely by identifying the bottlenecks in flows and nodes that might hinder local food systems. Such advances can aid inform policymakers and community initiatives aimed at promoting sustainable food systems – bearing in mind production, processing, distribution (or retail) and consumption activities – and enhancing the overall well-being of rural communities.

CHAPTER 6

CONCLUSIONS

This research work has furthered knowledge on people's food and nutrition security in rural areas, by identifying what are the patterns, strategies and challenges for rural residents to access local foods. It has contributed to the scientific and political debates on rural development in the fields of sociology of consumption, sustainable agriculture, and community development. It has focused on the role of consumers in the rural development project, by assessing local food systems from a consumer and territorial perspective.

In terms of food availability, the first contribution of this research work is the mapping of 149 Local Food Networks (LFN) promoting local food consumption in Portugal. We now know there are at least six different formats of initiatives with common characteristics and spatial distribution (box scheme, local food shop, producers' market, catering, fair/festival, and multiple).

Second, we discussed local food accessibility through a proposed 2-tier typology of Local Food Networks in Portugal, using a geographical and behavioural approach ('versatile' and 'fixed'). LFN 'versatile' operate in multiple municipalities or have no link to a specific location and connect producers and consumers through an intermediary, whereas LFN 'fixed' occur in single municipalities via face-to-face interactions between producers and consumers.

Regarding local food utilisation, this thesis uncovered an array of perspectives and practices surrounding 'local food' in rural areas in Portugal. We used a proposed analytical framework to reveal consumers' understandings, patterns, and perceptions on local foods. This framework can be applied for comparing local food systems' development in different territories.

Last, the stability of local food in rural areas was discussed in terms of the three behavioural structures that can activate small farm's integration in local food systems: market, reciprocity and redistribution. This proposed theoretical framework is interdisciplinary and considers all activities that go from local food production to consumption.

In conclusion, our study not only underscored the complexity of 'local food' but also illuminated the dynamic interplay between geographical conditions, socio-cultural aspects, and governance structures to promote local food systems. This new empirically-based knowledge confirmed that the current unfolding of Local Food Systems in Portugal aligns with the European rural development paradigm, and that local food availability varies across rural areas in Portugal. In conclusion, we identified that the current rural development approach in Portugal might unintentionally be perpetuating the urban-rural divide, thus contributing to rural abandonment and social inequalities.

These insights can be useful for policymakers, researchers, and stakeholders aiming to support and enhance local food systems in line with EU's rural development strategy for promoting vibrant rural communities. We invite further empirical research in other rural contexts to test the analytical tools proposed in this thesis.

APPENDICES

Appendix 1. Original version of article presented in Chapter 2.3, published in Global Food Security as Hernández, P. A., Galli, F., Prosperi, P., Šūmane, S., Duckett, D., Almaas, H. E. (2021). "Do small food businesses enable small farms to connect to regional food systems? Evidence from 9 European regions"

Global Food Security 29 (2021) 100505

Contents lists available at ScienceDirect

Global Food Security

journal homepage: www.elsevier.com/locate/gfs

Do small food businesses enable small farms to connect to regional food systems? Evidence from 9 European regions

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ARTICLE INFO

Keywords:
Small food business
Small farms
Food system approach
Integration
Localised food systems

ABSTRACT

For small farms across Europe, connecting to small food businesses offers a significant route to market. We analyse survey data from 85 small food businesses in nine European regions and explore the enabling and limiting conditions around this connectivity. We show how connectivity depends on context-based interrelationships among food system actors and consider the effects of these relations on small farm integration. Results show stronger connections when small food businesses are themselves farm-based. Weaker linkages are also apparent in the absence of public and social support. We argue that regional food systems can be enhanced by increasing small food businesses' capacity to source from small farms, with the added benefit of increasing the viability of these small businesses.

1. Introduction

The industrialisation of food systems and the increased urbanisation undergone in Europe during the last century has led to transformations in the way we manage food production and relate to food consumption (Moragues-Faus et al., 2017). It has caused the de-territorialisation of food systems (Vasta et al., 2019)) through the concentration of control in the agrofood sector (IPES-Food, 2016) and the fragmentation of social relationships (Mourato et al., 2018). Support for small farmers has been debated as key to restore food systems and promote rural sustainability (Fanzo, 2018; Galli et al., 2018; Reina-Usuga et al., 2018) both via the promotion of sustainable, innovative and competitive farming systems (Khalil et al., 2017; Randelli and Rocchi, 2017; Tribaldos et al., 2018) and through the increased integration of small farmers in short food supply chain (SFSC) initiatives, such as localised and alternative food systems (Brinkley, 2018; Lamine et al., 2019).

It has been widely documented that SFSC can help reduce the vulnerabilities of local food systems by activating endogenous resources and promoting regional embeddedness (Yacamán Ochoa et al., 2020), with processing as a crucial link enabling producers to transform food surpluses (Yacamán Ochoa et al., 2019). SFSC are catalysts of initiatives in food systems based on principles of proximity and trust-based relationships, often described as chains with no more than one intermediary (Chiffoleau et al., 2016) and defined according to a context-based geographical distance between producer and consumer (Kebir and Torre, 2020).

Small food businesses (SFB) can be important actors in SFSC. They can help re-territorialise food by "capitalising on the many advantages small food producers have over the industrial food system, including freshness, variety, [provenance], and transparency on how the food was produced, while creating the opportunity to develop social bonds with their customers" through innovative interactions (e.g. new outlets, new forms of relationships and place-based initiatives, etc.) (Halweil, 2004). SFB, in our study, refer to enterprises carrying out activities related to any stage of production, processing and distribution of food; establishing a buyer-supplier relationship with the regional small farms (Grando et al., 2019); are locally owned (the capital remains in the region); and, use key foodstuffs in the territory. 'Small' relates to their size as regards

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https://doi.org/10.1016/j.gfs.2021.100505
Received 7 October 2019; Received in revised form 18 July 2020; Accepted 25 January 2021
Available online 31 March 2021

economic features and labour (on average, no more than five non-family paid employees in all sampled SFB).

However, the capacity SFB might have to embed small farm products in local food systems is still to be scrutinised. The outcomes from SFB-small farm dynamics depend on a number of conditions (e.g. small producers' capabilities, market and political infrastructures, and other factors) that are context-based (Böhme et al., 2008). Several micro-environmental factors also affect SFB's relative competitiveness to work in collaboration with small producers, such as logistics and supply, which are inherently linked to the businesses' small-scale retailing capacity (McKeever et al., 2014) and the issues in the scaling up of SFSC (Connelly and Beckie, 2016; Yacamán Ochoa et al., 2019).

Aiming to explore the capacity of SFB to integrate small farms in food systems, our paper operationalises the proposed theoretical analysis model by Corrêa et al. (2020) situated in entrepreneurial studies (Fig. 1). It uses empirically-collected data from 85 selected SFB in nine European regions part of the Horizon 2020 SALSA Project – *Small Farms, Small Food Businesses and Sustainable Food and Nutrition Security* (2016–2020). Our study focuses on the micro-environmental elements ('externalities') characterising SFB integration into the food system, from a relational perspective, and less on the internal specificities determining each enterprise's behaviour. It aims to expand understanding of structural relations affecting the small businesses environment. Its objective is to identify relevant food system interrelations enhancing or hindering SFB capacity to integrate small farms in food systems.

The next section is structured in five parts. It first sets the conceptual approach to explore our research object and ground the methodology. Then, it describes the methodology used for data collection and analysis. Section 4 includes our empirically-grounded results, followed by the discussion of our findings. Last, we present our conclusions.

2. Conceptual scope

We adopt a food systems approach to discover the relational elements determining SFB behaviour in the regional food system (Ingram, 2011). We understand food systems as "complex multilevel networks of actors (and related activities) embedded in intricate socio-economic, political and ecological relationships that shape their outcomes across different geographies and social groups" (Moragues-Faus et al., 2017). We embrace the definition of territorialised agro-food systems suggested by Rastoin (2015) to look at the complex dynamics circumscribed in each EU region (NUTS3) examined, placing them in what we call regional food systems: the "set of agri-food sectors localised in a regional geographic space and coordinated by territorial governance". Likewise, we analyse SFB-small farm linkages in the context of food system activities (production, processing, distribution and consumption) and interactions with other actors and elements (Ericksen et al., 2012).

The model proposed by Corrêa et al. (2020) is used to comprehend how the development of SFB can affect the integration ('embeddedness' in Granovetter's terms) of small farms into the regional food system. Local embeddedness is a conceptual approach used in rural entrepreneurship studies to examine the nature, depth and extent of entrepreneurs' social and local ties within their rural contexts (Pato and Teixeira, 2016). We look specifically at SFB collaborations with regional small farms in our food system analysis, understanding that "entrepreneurship is embedded, submerged and absorbed in fluid networks of individual relationships and economic objectives conjoined with non-economic ones according to each social context (McKeever et al., 2014). Its adequateness to our research is manifold: first, it presumes entrepreneurs' decisions are the combination of multiple relational and context-based (territorial) factors, going beyond a merely rational choice approach; second, it captures the integration of entrepreneurs into relational structures or systems from a holistic perspective that blends society, culture and economy; and third, it considers two non-economic processes, redistribution and reciprocity, as social behaviours coexisting alongside market behaviours.

Our analytical model represents entrepreneurs, hereby SFB, as adaptive actors in multi-faceted interrelations with various values, norms and institutions across three structures: market, redistribution and reciprocity. It understands that SFB are "creating network structures as a result of self-seeking actions by focal nodes and their connections" (Ahuja et al. (2012) cited in Corrêa et al., 2020:233), and considers the systematic context-based specificities affecting SFB trajectories in food systems. In our analysis, these three structures are non-hierarchical, work in interdependence with each other, and are assumed as forms of integration:

1) *Market structures* include all market-related rationalities impacting the SFB-small farm interaction. They depend on the value chain that actors operate in, but also on multi-level market pressures defining the rules of supply and demand (e.g. raw material sourcing, concentration of value chains, etc.), as well as businesses' distribution and marketing strategies (Armendariz et al., 2015). Here, we include the multifunctional dimension of small farms' activities (Renting et al., 2008), such are diversified value chains, and all factors responding to the market limitations within a specific food system.

2) Reciprocity considers the exchange of material or immaterial goods to one another for mutual benefit, by virtue of values and norms that aim at maintaining social ties (e.g. families, clan, friendship, communities, associations, etc.) (Corrêa et al., 2020). We pay particular attention to *reciprocity structures* (both formal and informal) among food

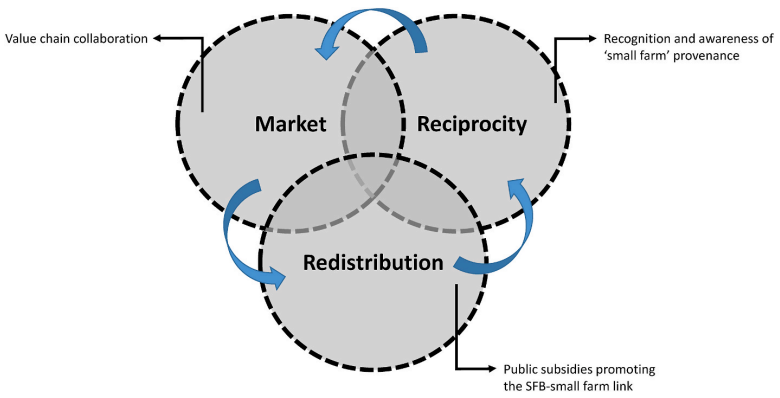


Fig. 1. The three structures determining the capacity of small food businesses to integrate small farms in regional food systems. Adapted from the proposed theoretical analysis model of Corrêa et al., 2020.

system actors that promote collaboration between SFB-small producers (e.g. product certification or labelling schemes). Collective arrangements, such as small farmers' associations and complementary food networks (e.g. purchasing groups) are also considered here, plus cultural norms like food habits and consumer demands. All of these have the capacity to prompt closer links between SFB with regional small farm producers, prioritising collective welfare and social stability (Marshall et al., 2018).

3) Redistribution assumes processes and measures (whether local, national or supranational) prescribing that members of a collectivity make contributions (i.e. in the form of taxes, goods or services) to a central agency with the responsibility to allocate these contributions to a shared interest of the collectivity (Corrêa et al., 2020). *Redistribution structures* include centralised norms or values that can play a facilitating and/or discouraging role in the promotion of the SFB-small farm link (IPES-Food, 2016); for instance, through the allocation of public support via national and European funding mechanisms. Financial support through the EU Common Agricultural Policy (CAP), Rural Development Programmes (RDP) (i.e. on-farm processing), I&D support, etc. belong in this category.

Three core questions underpin our research and guide our discussion: *i) how feasible is it for SFB to procure raw materials from small farms*?; *ii) what is the relevance of 'small farm' provenance branding vis-à-vis other labels such are 'local' or 'artisanal' in terms of consumer perceptions and SFB marketing strategies?; and iii) what is the support small farms have to get into processing and enter into SFSC as small food businesses*?

3. Methodology

3.1. Data collection

The empirical foundation for our study is data collected in 2016–2018 from 85 purposely selected SFB in nine NUTS3 European regions (Annex 1): Alentejo Central - PT183, and Oeste - PT16B (Portugal), Lucca - ITI12, and Pisa - ITI17 (Italy), Latgale - LV005, and Pieriga - LV007 (Latvia), Hedmark - NO021 (Norway), East Scotland/Perth and Kinross, and Stirling - UKM27 (ESc), and West Scotland/Lochaber, Skye and Lochalsh, Arran and Cumbrae, Argyll and Bute - UKM63 (WSc) (United Kingdom). Whilst not statistically representative, they aim to show the diverse connections that SFB can establish with small farms in different food systems across the continent. Moreover, European rural regions have a longstanding history of maintaining strong links with food systems (Pinto-Correia et al., 2018). Small food businesses were selected according to the SALSA criteria (Rivera et al., 2019). Each SFB had to: be linked to one of four key food products studied in each region; source at least one of its raw food products from small farms; have on average no more than five non-family paid employees; and, be locally owned (specifically, the capital remains in the region). Approximately nine SFB were sampled per case study. The selected SFB ranged from food processors, to food retailers and to food service businesses (HoReCa industry - Hotels, Restaurants and Catering).

Our sample includes SFB with diversified activities (e.g. wine-making, cheese production, baking, agro-tourism, selling of foodstuffs, etc.). The main value-adding activity reported was processing (40% of the sample), followed by distribution (34%), although with great variations across the regions (Table 1). SFB carrying out processing activities transformed raw foods, which could be produced on-farm or purchased from other suppliers, into processed products such as olive oil, wine, fermented foods, cured meats, fruit jams, etc. Lucca, Pisa and Hedmark included the larger number of processing SFB; whereas Oeste, ESc and WSc presented a greater number of SFB involved in distribution activities of products like fruits and meals. In this study, we refer to small farms that transform their own products and sell them in processed form through various commercialisation channels as "farm-based SFB".

Various data sources inform our analysis: i) A common, structured questionnaire addressed to SFB on the businesses' demographics, activity, labour and income, market relations, governance issues, and perceptions and future perspectives (Annex 2); ii) specific questions about SFB done through interviews with regional small farms in a separate interview survey (Annex 3); and, iii) subsections of the Food System Regional Report (Annex 4) reporting the validation of data collected in each region through individual interviews to key informants and participatory methods with actors across the sector (four focus groups and one regional workshop, both per region). A key aim of these mixed-source methods was to capture the different profiles of SFB, as well as to identify their relevant opportunities and challenges at the regional food system's scale. Annex 5 shows the scope and number of participants in our collection methods.

3.2. Data analysis

Data analysis started with qualitative/semantic analysis (Corbin and Strauss, 2008) of the data sources, building a list of key issues per region regarding SFB development. The list of key topics from all regions were compared and synthesised into five variables. From the SFB questionnaire, we selected data sets supporting our assumptions for each variable, which later were validated with the reports. SFB_Q21,22,28 were analysed quantitatively; whereas two variables required a mixed-methods analysis. For Question 6 (SFB_Q6) '*What activities do you carry out?*', we merged similar activities and coded them in four categories, adapting Ericksen's (Ericksen, 2008) four food system processes (1- production (baking and cooking); 2- processing (refining and processing); 3- distribution (retailing and marketing); and 4-other (activities not fitting in categories 1,2, or 3). Instead of using consumption as our fourth category, as proposed by Ericksen, we kept 'other' as in-vivo code, for consumption does not apply as a business activity and data reveals a wide range of uncategorised activities. Questions 19 and 20 (SFB_Q19) '*What are your raw materials?*' (list and number of products) and (SBF_Q20) '*Who supplies your raw materials?*' were analysed in two ways (Annex 6). The first one considered each SFB individually, thus producing 85 data values. Entries mentioning 'local and regional small farms' or 'own produce' under SFB_Q20 for core products only were labelled Y– yes (indicating a direct connection with small farms, or zero intermediaries between SFB-small farms); while the rest were labelled N– no (indexing an indirect connection with small farms, or one or more intermediaries between SFB-small farms). The second method looked at all the suppliers provided in all responses - a total of 143, because SFB often provided more than one supplier per item. All suppliers were later codified into 6 categories (self, farm in region, local processor/coop, retailer/supermarket, farm outside region, wholesaler) using qualitative

Table 1
Characterisation of SFB in the sample, according to their main adding-value activity.

SFB main activity	NUTS 3 regions									Total
	Alentejo Central (PT)	Oeste (PT)	Lucca (IT)	Pisa (IT)	Latgale (LV)	Pieriga (LV)	Hedmark (NO)	ESc (UK)	WSc (UK)	
Production	2	2	2	1	3	3	0	2	1	16
Processing	2	4	5	6	3	5	7	0	1	33
Distribution	1	7	1	4	2	1	3	5	4	28
Other	0	0	0	1	3	0	1	2	1	8
Total SFB	5	13	8	12	11	9	11	9	7	85

analysis.

4. Results

In our data, we found three interrelated aspects impacting SFB capacity to integrate small farms in food systems: value chain collaboration, lack of branding for small farm foodstuffs, and limited public support. They indicate the particular set of relationships affecting the trajectory of these businesses. All variables inform about the various partners along the value chain and what sort of processes SFB (may or may not) engage in.

4.1. Value chain collaboration

According to our results, SFB confirmed they procured raw food materials from multiple suppliers and reported that raw material procurement makes part of the business strategy to ensure economic viability and satisfy consumer demand, considering aspects such as purchasing price, quantity volumes and continuity of supply, etc. However, it is noteworthy to say that the capacity of SFB to integrate small farms in food systems depended on whether the SFB was farm-based or not. Our data confirmed 'self' as the most dominant supplier in sample (28%), representing SFB that were farm-based. The next suppliers in line were "retailer/supermarket" (23%), which could be from inside and outside the region, and "farm in region" (21%), including all farm sizes small, medium and large. Fig. 2 shows the different suppliers SFB reported to use.

Where SFB were farm-based, diversification of activities and use of non-conventional market channels (e.g. SFSC) showed across our case studies to enhance small farm participation in secured markets. Multifunctional farming included agro-tourism activities, common in Lucca, Pisa, and Alentejo Central, which have fostered local and traditional food production and transformation techniques (i.e. micro-processing technologies) to cope with seasonality and expand product availability. Farm-based SFB interested in reaching proximity consumers also confirmed participation in SFSC. A growing niche identified in the Latvian dairy sector was represented by small dairy farmers, who strengthen their market access and position by on-farm small-scale processing and production of various kinds of artisanal dairy products. In many instances they market these products through their own or less conventional channels (e.g. on-farm shop, farmers' markets).

Interaction of small farms with SFB was also detected in the horticulture sector through SFSC with contracts relying on proximity and a good customer-producer relationship [ESc, WSc, Hedmark]. One example is a horticultural enterprise on the Isle of Arran [WSc] producing herbs and specialised vegetables which intermittently had contracts with local restaurants within a few kilometres. This farmer/business owner preferred to operate a more reliable, seasonal catering business at festivals and pop-up restaurants via direct marketing. Small farms and SFB [Pieriga] collaborated through common marketing initiatives, primarily at farmers' markets, but could take other forms such as direct purchasing groups, online direct selling platforms, or local artisanal cooperatives. Although such business models are small producer-friendly, they can also be volatile. For instance, the Stirling Food Assembly (ESc) ceased trading in 2017 and participants on the Isle of Bute and the Isle of Skye (both in WSc) complained that farmers' market organisation was unreliable and often depended on volunteers. Our data also confirmed that small-producers' cooperatives can facilitate SFB access to small farm products [Oeste, Alentejo Central]. Such specialised cooperatives collect raw materials from various small farms year-round thanks to their effective storage facilities (e.g. pear, wine, olive oil) and supply the market continuously. SFB using this channel argued that it simplifies logistics by putting all outputs – mostly fruits and horticulture – collectively into a common pool that can better meet the demands of a competitive market.

The connection between small farms and SFB in terms of "suppliers – buyers" was, nevertheless, not evident in our sample. Off-farm SFB often said they preferred to buy products from wholesalers and larger farms that can ensure regular supplies. In cases where small farms marketed their products indirectly, i.e. through other market intermediaries, SFB were usually not among them. For instance, a dairy farmer [Pieriga] indicated that the disappearance of smaller shops in the region has limited available market outlets for local small farmers.

In general, SFB found it easier to procure raw materials from suppliers other than small farms, because of lower transaction costs (single order, traceability, less paperwork) or to guarantee steady supplies. Similarly, SFB did not source from small farms because many small producers preferred to market through conventional channels and not sell to smaller buyers. In the two Scottish regions and Latgale, connections were generally weaker for off-farm SFB. Farm produce shops in ESc and Hedmark reported they preferred continuity of supply and volumes that are difficult for small producers to fulfil, procuring instead from bigger farms and wholesalers. Fig. 3 shows the distribution of suppliers declared by SFB across the studied regions.

However, regulations on food production and distribution were cited by some business owners as risk factors that hamper the planning and development of SFB. Processing businesses (i.e. abattoirs and creameries), it was argued, are more likely to take produce from small farms, however these businesses are generally not "small" [Scottish regions, Hedmark]. Food safety regulations (food handling, traceability of food, food labels, etc.) were also claimed an issue [Alentejo Central, Lucca, Pisa]. In particular, administrative and food safety requirements were deemed "bureaucratic and burdensome procedures" that can hinder the viability of SFB (e.g. traditional production of *talha* wine – an example of retro-innovation of homemade wine made with traditional processing

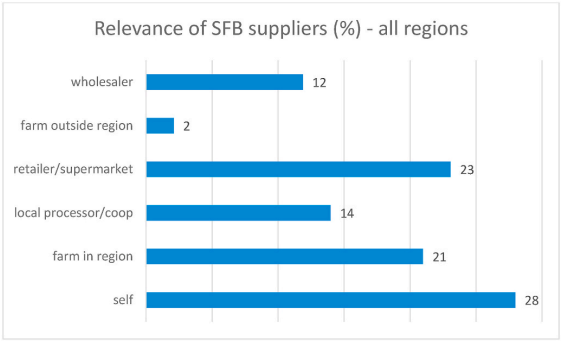


Fig. 2. Reported suppliers by all sampled SFB (*farm in region includes small, medium and large farms).

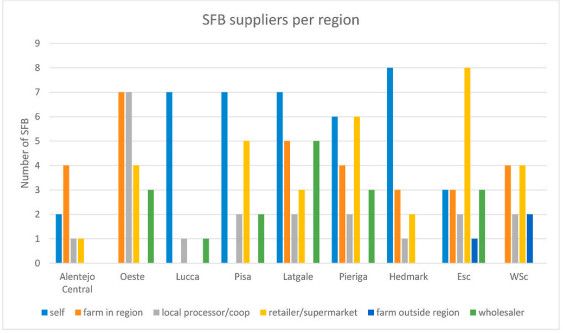


Fig. 3. Distribution of suppliers declared by SFB across the studied regions.

techniques [Alentejo Central]). As a result, SFB stated they must sometimes source from non-small farms to comply with such rules to achieve regulatory compliance and attain their business goals.

4.2. Lack of branding for products from small farms

From our sample we learned that no brand or label exists that identifies products produced by small farms in the market. Instead, official certification and labelling schemes were argued to be used by small farms to give added-value to products, reconnect consumers with producers (including via SFB), and tell a story behind each product (e.g. where, how and by whom it was grown/raised). SFB reported national and international schemes on specific production methods (e.g. organic, integrated production, GlobalG.A.L.P., Tesco Nurture), food quality (e.g. Local Food Quality Assessment and KsL [Hedmark]), geographic provenance (e.g. PDO and PGI, Slow Food) and cultural heritage (e.g. artisanal products, Culinary Heritage Movement and European Culinary Centre [Latgale]). Similarly, labels promoting "local", "fresh" and "traditional" products were informally employed to attract consumers and tourists.

Nearly sixty percent of the total businesses sampled (50 out of 85) declared non participation in any certification or labelling scheme. Justifications for this behaviour included the lack of incentives and the bureaucratic burden. For example, in Latvia, certifications (i.e. organic, artisanal production) and marketing authorisations were held to be complicated and expensive to comply with, and the controlling bodies criticised as too restrictive. In Lucca, none of the sampled SFB participated in any certification or labelling scheme. Fig. 4 shows the number of SFB participating in certification or labelling schemes across the regions. Procuring from small farms did not appear to be a strong unique selling point (USP) for farm shops in Scotland to leverage either. Uncompetitive prices when compared to large scale operations were also a reason for some SFB to opt for other (and cheaper) raw material sources and skip any branding strategy. In Portugal, a lack of consumer demand for small farm products was said to undermine the viability of SFB using products from small farms: "Lamb meat is looked down upon by younger consumers, who would rather consume beef or pork produced outside their region", as mentioned in one focus group. In Alentejo Central, niche products were also said to resonate more with tourists, who were credited with greater purchasing power, willingness and curiosity to pay for added-value products. A business owner in Latgale argued a certification held in the past provided no added-value to the business either.

4.3. Public support

For subsidies, we refer to the financial public support that SFB can take advantage of to invest in their activities. In our case studies, less than half of the SFB received any type of subsidies (45%), with great variation across regions. Our data informed us that less than half of the sampled SFB reported support through public funds (Fig. 5). The main identified limitations were the absence of support for SFB to apply for

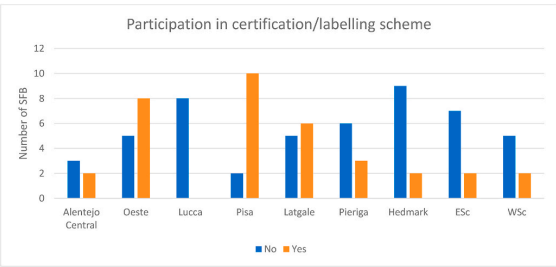


Fig. 4. Reported use of certification or labelling schemes by all sampled SFB.

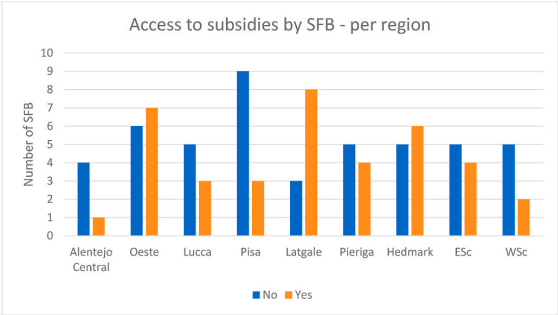


Fig. 5. Number of SFB receiving public subsidies by region.

such subsidies, and/or the lack of specific funding for SFB that do not carry on-farm activities.

Data from the two Italian regions hint that subsidies for SFB are primarily agriculture-driven and derive mostly from the EU Common Agricultural Policy, Rural Development Programmes (RDP) and Common Market Organisation frameworks. This public financial support included single area payments, subsidies for organic agriculture, tax exemption for fuel, and others. Regional governments can also implement laws at a regional level promoting diverse and multifunctional activities by small farmers [Lucca and Pisa] (e.g. on processing and conditioning of on-farm products, Tuscany Region, 2018). This law aims to make processing and sale of local and on-farm products easier and more flexible (e.g. taking into account local and seasonal ingredients, farmers are allowed to process food in their kitchen if respecting food safety requirements). The support programme for the development of small-scale food processing was said to foster the emergence of many small businesses in the Latvian and Italian regions, through grants that help SFB acquire equipment or build processing facilities. Promotion of SFB in Latgale was said to take place through various means (i.e. a culinary heritage movement, rural tourism activities, LEADER projects, cultural events such as town festivals, traditional celebrations, and food and tourism fairs). One SFB producing wine liquor [Oeste] stressed the important support from the RDP to help launch the business idea, upgrade buildings and equipment, and also make investments.

In Norway, a national policy designated for the development of SFB has been in effect for the past 20 years, strengthening SFB position in the value chain (e.g. SFB could apply for innovation/seed funding for business start-ups). Most businesses sampled in Hedmark expressed satisfaction with governmental regulations and believed them to be fair, as well as important for their businesses' credibility. On the one hand, SFB owners were pleased with the food safety authorities from which they received advice, legal information, and training on how to establish and run a SFB, increasing their entrepreneurial skills. On the other hand, food businesses in Norway can benefit from positive discrimination through the exemption of registration or approval by the national food safety authorities, as long as they: i) deliver products directly to consumers; ii) distribute products in the local market (within 100 km); iii) deliver up to 600 kg of produce per week; or, iv) do not sell animal products ("Mattilsynet. Lokalmat - registrering og godkjenning," 2018).

In contrast, many small farmers interviewed in Pieriga expressed willingness to develop some kind of on-farm processing, but claimed not having the necessary resources (funding, facilities, and knowledge) to implement these plans. In Alentejo Central, non-farm based SFB (e.g. agro-tourism, meal preparation, and agricultural machinery rental) reported difficulties in receiving public subsidies. In Alentejo Central and the Scottish regions, support was said to be tailored mostly for large-scale operations.

5. Discussion

This section explores transversally the existing interrelations between SFB and regional small farms in our case studies. The SFB-small farm link varied across our data, reflecting the different abilities SFB have to choose their activities and partners, based on the possibilities and resources available, plus their capacity and skills to turn those resources into entrepreneurial opportunities (Steiner and Atterton, 2015). The discussion below is guided by the three sets of structures (market, reciprocity and redistribution, Table 2) and examines where this link might be challenged and the relationships that can be fostered to enhance the integration of small farms in regional food systems, and, thus, increase SFB development.

5.1. Integration through market relations

We assessed the integration of small farms in the regional food system in terms of their behaviour in the value chain, which refers to the context-bound networks of [food system] actors that "exchange goods, financing, and information, as well as collaborate in the medium and long terms" (Monastyrnaya et al., 2017). This form of integration enabled us to understand *how feasible is it for SFB to procure raw materials from small farms*?

The analysis from our results indicate that the SFB-small farm link depends on whether the SFB is grounded on farming activities or not. If the business is off-farm, results showed that raw materials are mostly purchased by any supplier, except small farms. Two main issues might help explain the limitations for small farm products to remain in the local market, and/or be purchased by SFB: small farms cannot secure the SFB market because they cannot compete against the volume, continuity of supply, and price offered from less expensive suppliers, such as wholesalers and large farms. On the other hand, small farms are likely transforming the product and bringing it directly to the market via SFSC, increasing the value of these products to which SFB cannot access.

As shown in section 4, SFB that do not produce their own raw material tend to source them from the most economically viable channel in the market. This phenomenon responds to current trends in the de-territorialisation of food systems, stimulated by the concentration of power in food systems thanks to the vertical control of food processes in a handful of actors setting the rules of food production and distribution (IPES-Food, 2017). On the one hand, a strategy for small farms to remain viable is by entering SFSC, because these forge "new value chains" with redesigned set of codes, practices and rules to help overcome any competitive disadvantages in terms of demand and marketability of small farm products (Roep and Wiskerke, 2013). Against this backdrop, SFB are unlikely to purchase their raw materials via SFSC, not only due to increased costs but also because this would add one more intermediary between producer-consumer, which is the opposite of what SFSC stands for (Chiffoleau et al., 2016).

SFB are likely to purchase from actors capable of guaranteeing a steady flow of affordable products, because of their weakened bargaining capacity in food systems (Yacamán Ochoa et al., 2019). Large processors – who are often better geared for interacting with large producers – also represent a viable source for SFB, because the former are often better suited to make investments in basic processing such as washing, grading or packing, and can also devote more resources to customer relationship management (CRM). Large processors in the UK, for example, tend to be centralised and have consolidated over recent decades (e.g. slaughterhouses and creameries), creating logistical challenges and adding transportation cost to small farms' operations (Kennard and Young, 2018).

Table 2
Challenges and opportunities to enhance small farm embeddedness in regional food systems, according to the three forms of integration.

Form of integration	Challenges	Opportunities
Market	- raw materials outsourcing - regulatory barriers ○ food production (e.g. food safety) ○ food distribution (e.g. logistics)	- promote innovative value chains for small farms (e.g. SFSC and small producers' cooperatives to scale-up SFSC)
Reciprocity	- lack of brands that identify products from small farms - consumers' perceptions about small food products	- create labelling schemes identifying small farm produce - increase consumers' awareness on small farm foods
Redistribution	- limited public funds	- improve financial support oriented for SFB that do not carry on-farm activities - promote positive discrimination for SFB in public governance frameworks

5.2. Integration through relations based on reciprocity

We see the integration of small farms in regional food systems through the functioning reciprocity structures (both formal and informal) that hint at the forms of collaboration between SFB-small producers. Based upon our findings, we argue that SFB marketing strategies and consumer perceptions play a key role in understanding *what is the relevance of 'small farm' provenance branding vis-à-vis other labels such are 'local' or 'artisanal'*.

Our results confirmed that foodstuffs produced by small farms are not identified with a brand or label that differentiates them, but which could potentially increase their positioning in the market. Two interrelated reasons might help explain this. First, the large array of brands identifying food products (e.g. geographical denomination, production methods, trade conditions, healthy diets, etc.) might be sending mixed signals to consumers, while negatively affecting their purchasing choices (Watts et al., 2018). Second, little effort (public or private) has been made to increase consumers' awareness about the socio-economic and environmental benefits of supporting local foods produced by small farms. These tendencies might limit the capacity of SFB to expand their activities by actively promoting small-scale farm products.

The role of consumers in creating, designing and impacting alternative food networks has strengthened in the last decades (Randelli and Rocchi, 2017); although not homogeneously. Labelling and certification schemes nowadays in Europe emphasize on origin, quality, tradition, history and are related to a territory (Delicato et al., 2019; Giampietri et al., 2016); however, all of these brands remain mostly niche-centred. This phenomenon has in fact brought about the reconnection of some consumers to the food source, while disregarding issues on food production scale and food affordability. The main problem is that although products are labelled 'local' or 'artisanal', and appear to be locally-sourced, small manufacturers - as shown in our results - increasingly import raw materials from outside the region or purchase from large-scale suppliers offering affordable prices, while relying on local industries and services (Avermaete et al., 2004), but still branding them as 'local'. This practice is not only misleading but also discouraging for local consumption by residents in the area, who might recognise whether or not food is in season or appropriate for the territory and lose trust in such labels. On the other hand, well-off consumers (e.g. tourists), at whom most of these certified products are targeted because of their higher purchasing capacity (Balogh et al., 2016), find themselves misinformed while supporting products often produced conventionally by medium and large operations.

Additionally, the increased popularity in Europe of multiple certification labels and brands are conflicting with each other in hybrid food systems that foster the dis-embedding of food systems, while possibly leading to consumers' confusion. This is the case of in-house

certification schemes created by large retailers (e.g. hyper- and supermarkets) for 'local' or 'regional' food, which have blurred the boundaries between conventional and alternative supply chains (Bui et al., 2019) and put aside the ethical premises of SFSC. This behaviour could be hindering the capacity of SFB to capture the 'local market' by selling higher quality and specialised products from small farms (Meyerding et al., 2019).

The lack of a clear label identifying and upholding products from small farms is proportionate with consumer awareness and familiarity about the role of small farms in promoting sustainable food systems, which is often facilitated by SFSC. As results confirmed, consumer perceptions about the quality of food produced by small farms depend on whether products are marketed through SFSC or not, as short distance chains (e.g. farmers' markets) have a closer and more direct link, where producers work closely with consumers and awareness raising campaigns often take place (Giampietri et al., 2016).

5.3. Integration facilitated by relations promoting redistribution

The decision for small farms and SFB to engage collaboratively requires mobilising new strategic alliances (e.g. establishing new relationships with food system actors) and building a strong support network of societal organisations, interest groups (e.g. consumers) and also governmental authorities (Esparcia, 2014). In light of this, we consider the processes and governance forms facilitating the allocation of public contributions towards SFB development, to respond to the question: *what is the support small farms have to get into processing and enter into SFSC as small food businesses*?

Our results indicate that the main identified limitations for SFB to scale up their activities were the lack of support for SFB to apply for such subsidies, and the absence of specific funding for non-farm SFB. A lack of supporting mechanisms for these businesses proved to hinder their development, as shown in section 4.3. Access to financial support was deemed essential for SFB to overcome the economic constraints of small entrepreneurs, and especially to establish a logistical infrastructure to market their products (e.g. processing equipment, storage conditions, distribution points, etc.) (Rucabado-Palomar and Cuéllar-Padilla, 2018). As confirmed in our results, application to public subsidies can be a complicated endeavour, often requiring a high literacy level to meet the application requirements adequately. Having technical support and advice in subsidy application (e.g. what kind of programme measures their activities can be funded through) was shown to pay off in Hedmark, where a national framework is enhancing the economic sustainability of SFB with the promotion of SFSC.

On the other hand, the fact that most public subsidies are targeted for farm-based SFB (interested in) carrying out activities like on-farm processing and agro-tourism shows the limited scope of the frameworks, and hints at the need to redefine the wide spectrum of SFB. For instance, businesses in catering, retailing and distribution activities can play an essential role in the integration of small farms in food systems, yet they rarely fall under this umbrella. These off-farm SFB can be a pathway for small farm products, and thus enhance local food systems.

Our data confirmed that SFB can help small farms recover their bargaining capacity in a fragmented food system by participating in SFSC and/or by collaborating with small producers' cooperatives. These two forms of interrelationships might encourage actors to cooperate in 'alternative', local, and direct food initiatives that are crucial for the local economy, communities and also sustainable food systems (Brunori et al., 2016). SFSC can offer unconventional market spaces and relationships where SFB can be better positioned in the food system (Roep and Wiskerke, 2013), granting small farms with the flexibility of marketing conveniently from the farm shop or road stand, plus giving them control over price and the possibility of selling ad hoc (Mundler and Laughrea, 2016).

Cooperative SFSC (including producers' associations/cooperatives and 'food hubs') are another way to increase integration of small farms in regional food systems, as revealed in our results. Producers' cooperatives promote technological collaboration and support collective processes (e.g. production planning, storage, logistics, distribution, and marketing, etc.) that can enhance the efficiency, viability and competitiveness of small-scale producers (Yacamán Ochoa et al., 2019). These initiatives help with the scaling up of SFSC in places where there is increased demand for local foods, thus the need to satisfy in large volumes. To avoid opting for conventional food production that de-territorialise local food systems, the role of the public administration is essential in supporting small farms and SFSC. For instance, by promoting public procurement contracts via SFSC in school canteens, hospitals, etc. (Yacamán Ochoa et al., 2019).

6. Conclusions

Our study adopted a food system approach to further knowledge in entrepreneurial studies, by exploring the interrelations influencing SFB behaviour in food systems, in terms of recognizing their capacity to be embedded in regional food systems. Three key aspects were found in our case studies to determine the capacity of SFB to link small farms to food systems: value chain collaboration, product branding, and public support. These areas hinted at key nodes of interrelations between SFB and other food system actors that shape the specific set of values, norms and institutions promoting or hindering small farms integration in the food system through SFB. The degree of integration that SFB enable for small farms in regional food systems was considered in terms of three structures: market, reciprocity and redistribution.

We recognise our evidence stems from a limited sample of businesses and sectors, serving mainly to hint at behavioural trends. We discovered that, in general, SFB are more closely connected to small farms when the businesses are farm-based, for small farms act also as in-house product suppliers and can benefit from the agriculture-driven supporting frameworks available for SFB. A lesser connection was evident when the positioning of SFB in the food value chain is weak, whether because of their inability to enter secure markets that can help add value to their activities and products, the absence of a brand identifying 'small farm' products, or due to a lack of financial or social support. Ways to circumvent SFB limitations were found to be the promotion of SFSC, deployment of clear added-value labelling schemes, and support through public governance frameworks like the EU Farm-to-Fork programme.

Further studies on SFB marketing strategies could deepen knowledge about the entrepreneurial decisions behind SFB, enlightening about the motivations and drivers of participation in certification schemes and SFSC. Assessment tools could benefit from more empirical case studies to examine the various structures affecting integration of small farms in regional food systems via SFB, and, thus, inform policy makers about the steps needed to re-territorialise food systems.

Funding

This work is funded by the SALSA Project —Small farms, small food businesses and sustainable food and nutrition security— (Project ID: 677363) funded under H2020-EU.3.2. —Societal Challenges—Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy.

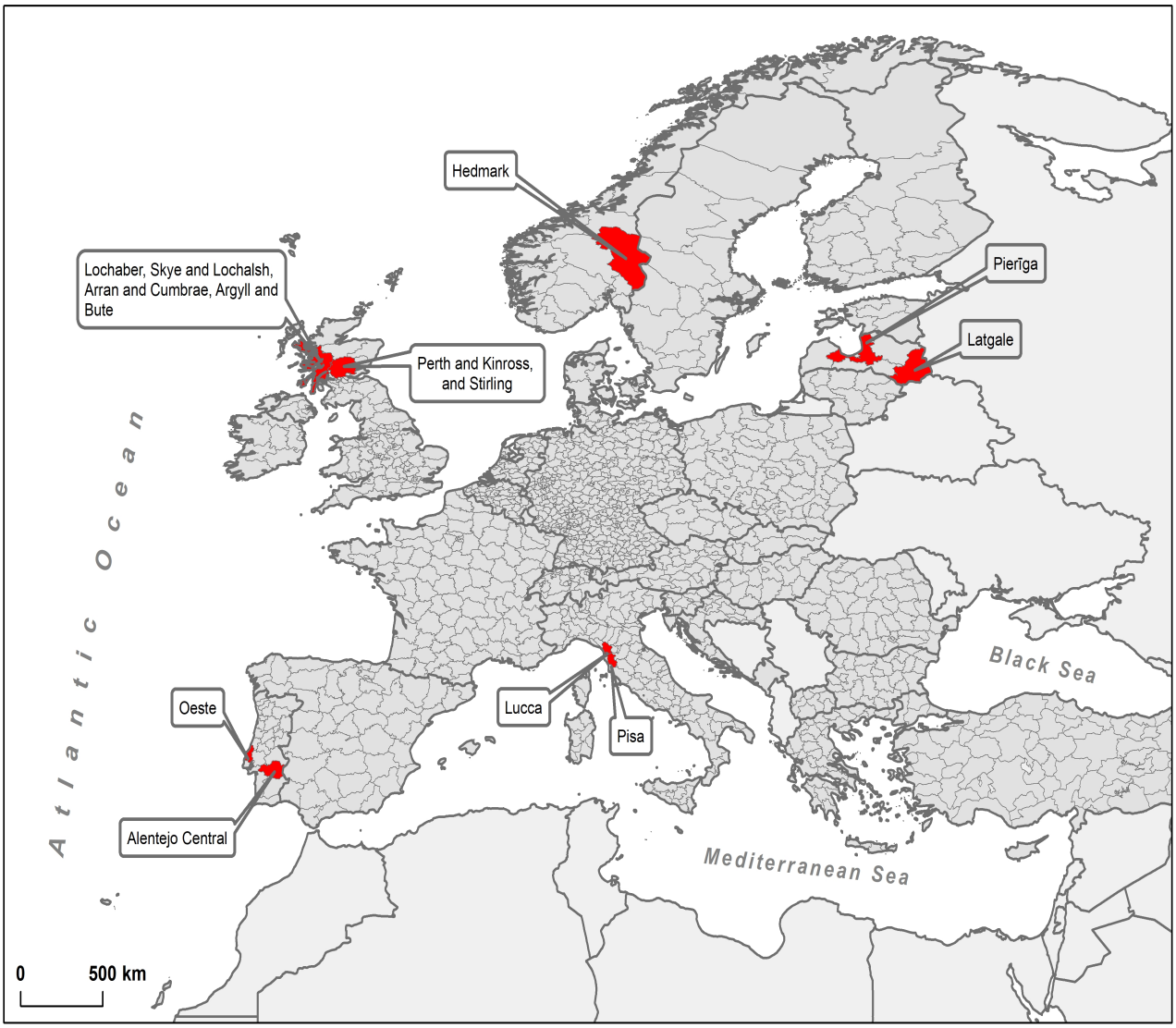
Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We would like to thank Bill Vorley (International Institute for

Appendix 2. NUTS3 regions considered in the pan-European study of Small Food Businesses.



Appendix 3. Questionnaire to Small Food Businesses.

Section 1: Background

1. Age (yrs)
2. Gender (F/M)
3. How long have you been in this business? (Include time helping as a child in the family's business or as an apprentice) (No. of yrs)
4. Why did you start this business (Family tradition, Marriage, New business opportunities, Lifestyle change, Other)
5. In the last 10 years, what has been the most significant turning point that has affected your business? And how did you deal with it?

Section 2: Description of production

6. What activities do you carry out? (Approximate share of your business's time that is spent in: Baking/cooking, Refining, Other processing, Retailing, Marketing, Other)
7. What products do you produce, cook or sell? (approximate %): Vegetables, Fruit, Grapes, Olives, Meat, Milk, Eggs, Cereals, Other
8. What is the distance from your business to the nearest urban centre (more than 10, 000 people), in Km?
9. How long does it take you to travel from your business to the nearest urban centre (more than 10, 000 people), with the transport you normally use? Type of transport:

Section 3: Labour and Income

10. What is the total annual turnover of the business? (€)
11. What is the total annual income of the business including subsidies (if relevant)? (i.e. what remains from the sales after all the expenses have been paid) (€)
12. How important is this business with regards to your total income? (%)
13. How many Family (non-paid) members work in your business permanently? And occasionally? F (NP): Permanent /Occasional
14. How many Family (paid) members work in your business permanently? And occasionally? F (NP): Permanent /Occasional
15. How many (paid) non-family members work in your business permanently? And occasionally? (Friends and neighbours) NF (NP): Permanent /Occasional
16. How many non-paid non-family members work in your business permanently? And occasionally? (Friends and neighbours) NF (NP): Permanent /Occasional

17. Could you potentially produce, cook or sell more quantity? If yes, what is constraining you from doing it? If not, why? (Y/N) If yes, what is constraining you from doing it? (cost of labour, inputs, too risky, etc.) Reasons.
18. What are your main expenses? Specify the expense, list and rate in order of importance, 1 being the most important expense

Section 4: Links with Food System

19. What are your main raw materials? List of raw materials.
20. Who supplies your raw materials? Suppliers.
21. Who are your main clients and in what proportion do you sell to them? (%) (Wholesalers, Other processors, Small Retailers, Supermarkets, Sold directly on business, Farmers markets, Restaurants, Hotels, Sold to consumers through purchasing groups, Through e-commerce, Others)

Section 5: Governance

22. Do you have access to subsidies or other forms of public support? (Y/N) Which?
23. Approximately what percent of your income do these subsidies represent? (Ask in relation to turnover if necessary) (%)
24. Do you have access to credit or finance when you need it? Who provides it? If not, why? (Y/N)
25. Are you a member of a cooperative or an association? If so, how important is it? If not, why not?
26. Which government regulations do you have to deal with? Describe.
27. Are there government or other regulations (e.g. supplier purchasing standards, hygiene regulations) that make it easier or more difficult for you to produce, cook or sell? If so, what are these?
28. Do you participate in third party certification schemes i.e. like fair trade standard, organic certification, PDO, protected geographical indication etc.?

Section 6: Perceptions and Perspectives

29. What are the points of strength of your business? And weakness?
30. What are the main external sources of risk for the business?
31. What are your objectives and priorities for the future of your business? what would you need for this to happen?
32. How do you see the future of food businesses like this one in the region in the coming years (10 years approx.)?
33. What is your plan for the continuity of your business after you retire? Will children, other family members or others take over? Will you sell?

Appendix 4. Questionnaire to Small Farms (specific questions relevant for Small Food Businesses).

Section 4: Market Relations

37. Do you do some on-farm post-harvesting processing? If so, describe (Y/N)
38. How important is processing as a source of revenue?
    1. Not important;
    2. Somewhat important;
    3. Very important.

Appendix 5. Food System Regional Report (specific questions relevant for Small Food Businesses).

Question # 5. Governance

a. Main interactions of small farms and SFB with governance structures in the region
b. Levels of governance and their relative importance to small farms and SFB
c. Constraints impairing full participation in the food System
d. External policies, decisions and social norms affecting food systems
e. Gender issues intersecting governance issues
f. Other actors and processes important for the regional food System
g. Forms of collaboration and organization between small farms
h. Forms of collaboration and organization between small farms and consumers
i. Relationship between small and large farms, and between small and large businesses
j. Other governance issues

Question # 7. Role of Small Food Businesses

a. Main insights and patterns
b. Labour in SFB work
c. SFB income
d. SFB households' coping mechanisms

Appendix 6. Scope and reach of the data collection methods.

Region	Key products	SFB	Key experts	Focus Group	Regional Workshop
Alentejo Central (PT)	wine grapes, olives, tomatoes, lamb	5	11	24	18
Oeste (PT)	pears, potatoes, wine grapes, chicken eggs	13	5	20	17
Lucca (IT)	vegetables, olive oil, fruits, wine	8	6	47	26
Pisa (IT)	vegetables, wheat, beef, wine grapes	12	6	61	21
Latgale (LV)	wheat, cow milk, potatoes, honey	11	10	16	17
Pieriga (LV)	wheat, cow milk, vegetables, apples	9	11	62	21
Hedmark (NO)	dairy, potatoes, berries, lamb	11	27	8	11
East Scotland, ESc (UK)	beef, lamb, mixed-horticulture, potatoes	9	7	12	16
West Scotland, WSc (UK)	chicken eggs, salad leaves, lamb, beef	7	7	10	10
Sub-total participants		85	90	260	157
Total participants		592			

Appendix 7. Data analysis - SFB_Q19 and SFB_20

Question #19 for SFB: 'What are your raw materials?' (list and number of products)

Question #20 for SFB: 'Who supplies your raw materials?'

1. Simple method (Y/N): based on the number of SFB respondents

Y – yes (direct connection with small farms, or zero intermediaries between SFB – small farms)
N – no (indirect connection with small farms, or one or more intermediaries between SFB – small farms)

Direct connection SFB – small farm	No	Yes	Grand Total
Alentejo Central	1	4	5
ESc	9	0	9
Hedmark	2	9	11
Latgale	9	2	11
Lucca	2	6	8
Oeste	10	3	13
Pieriga	8	1	9
Pisa	7	5	12
WSc	7	0	7
Grand Total	55	30	85
Percentage (%)	65	35	100

2. Broader method: including all 143 responses

Raw material supplier to SFB	self	farm in region	local processor / coop	retailer / supermarket	farm outside region	wholesaler	Total suppliers
Alentejo Central	2	4	1	1	0	0	8
ESc	3	3	2	8	1	3	20
Hedmark	8	3	1	2	0	0	14
Latgale	7	5	2	3	0	5	22
Lucca	7	0	1	0	0	1	9
Oeste	0	7	7	4	0	3	21
Pieriga	6	4	2	6	0	3	21
Pisa	7	0	2	5	0	2	16
WSc	0	4	2	4	2	0	12
Grand Total	40	30	20	33	3	17	143
Percentage (%)	28	21	14	23	2	12	100

Appendix 8. Original version of article presented in Chapter 4.2, published in Land as Hernández, P. A. (2023). "Enabling Conditions for Local Food Systems to Emerge in Predominately Rural Regions of Portugal—A Food Access Approach", 12(2) 461. Land. MDPI AG. https://doi.org/10.3390/land12020461

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Enabling Conditions for Local Food Systems to Emerge in Predominately Rural Regions of Portugal—A Food Access Approach

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Abstract: Local food studies have stressed the importance of local food systems (LFS) in shortening the linkages between producers and consumers and in promoting resilient territories. Food consumption patterns are mostly studied around rural–urban dynamics, urban food security, and the revitalisation of rural communities, but little is known about the impact of LFS over rural residents and their capacity to access local foods. This paper explores the development of LFS in rural areas, from a food access approach, by characterising the rural landscapes promoting local food consumption. From a mapping of 74 predominately rural municipalities, statistical data of six socio-economic and political variables were collected to depict each municipality. A cluster analysis and Pearson's correlation test informed us about the factors enabling these networks to emerge. Three clusters were identified: 'meso-urban', (N = 5) presenting urban-like characteristics (higher income and education levels, and reduced road infrastructure and small-scale farming); 'dense', (N = 26) characterised by high population density, road infrastructure and small-scale farming; and 'castaway' (N = 43) with low population density, income, post-secondary education, and expenditure in RD in agriculture. LFS emergence in rural Portugal was strongly determined by the levels of mean income and education levels in rural municipalities, which brought into question concerns regarding rural residents' capacity to consume local foods. Low physical access, purchasing capacity, and awareness of food issues appeared to compromise the utilisation of these foods by the most socio-economically disfavoured groups. However, other territorial externalities and empirical work not included in this study could further complement our findings and provide a richer picture for the localisation of food systems in rural areas.

Keywords: local foods; territorial approach; rural landscapes; cluster analysis; food access

Citation: Hernández, P.A. Enabling Conditions for Local Food Systems to Emerge in Predominately Rural Regions of Portugal—A Food Access Approach. *Land* **2023**, *12*, 461. https://doi.org/10.3390/land12020461

Academic Editors: Rafael Mata Olmo, Carolina Yacamán Ochoa, Nieves López-Estébanez, Rocío Silva Pérez and Jorge Hermosilla-Pla

Received: 26 January 2023
Revised: 9 February 2023
Accepted: 9 February 2023
Published: 11 February 2023

1. Introduction

Our food systems have been transformed rapidly and differently across the globe during the last century, reflecting unsustainable methods of producing and consuming food, an increased disconnection between food source and final consumers, and broadened social inequalities [1]. Heightened urbanisation in developed societies and concerns regarding these issues have prompted the re-definition of the linkages between the 'rural' and the 'urban' in a renewed set of relationships known as alternative food networks [2,3]. The emergence of such networks reflects the interest of individuals in supporting farmers and rural communities, to protect endangered (local) species and varieties, while considering the wellbeing of consumers in urban places [4].

In the mid-1990s, the concept of local food systems (LFS) experienced a surge in popularity, examining the transformation of rural areas, the new dynamics of the agri-food sector and changes in food consumption [5]. Namely, LFS have been praised for counteracting the concentration of power in transnational food supply actors [6] and empowering primary producers as multifunctional service providers for urban and rural

groups [7]. The concept of local foods is one that arose as a 'solution' to the negative externalities associated with the globalised and industrialised food system [8], based on the principle that shortening the linkages between food production and consumption can have positive impacts in the promotion of more resilient territories [9–11]. Shifting food production out of the industrial model and sourcing local produce through new chains has also been deemed to contribute to community health and nutrition, small producers' livelihoods, and rural development, while tackling the environmental side effects of input-dependent globalised food systems, according to Edwards (2016), cited in [4,12–14].

Some authors have, despite these arguments, cautioned against the generalisation of the concept and have called for more holistic and critical approaches to examining the benefits of local food systems across different scales [7,14,15]. In Europe, specifically, a careful analysis of LFS must consider the implications in the shifts in social structures and power dynamics amidst the new rural development paradigm ('new rurality'), which responds to changing geopolitical food and agricultural relations, according to Rytkönen and Hård (2016), cited by [16,17].

To date, LFS have largely been discussed in Europe in terms of their potential to contribute to small rural businesses and processes of rural development [18], with rural producers dominating the discourse [12], and the latter assumed to be the multifunctional providers of goods and services for urban consumers [7,16]. This is problematic for two main reasons: (i) it situates LFS as part of the "re-negotiation of the rural-urban agri-food relations, where rural areas, among other things, are required to 'work' for cities and their suburbs" [16], pg. 2103, thus leaving gaps in knowledge of the impact of LFS in rural areas; and (ii) the continuous adoption of a producer and urban-centred approach to discussing local foods limits insight into the capacity of consumers in non-urban territories to access these foods, and on how local food systems shape rural landscapes [19].

Knowledge about the transformative capacity of LFS in non-urban geographical spaces is also not uniform across the continent, and this subject is under-researched in Portugal [12,20,21]. For a start, each territory holds unique rural development traits that depend on the existing structures and financial capacities [22]. Social and political efforts for local foods in Portugal were heightened after the economic crisis of 2010–2014, within processes toward a national strategy in favour of family farming and food security. However, these efforts have concentrated on the protection of small family farm holdings as individual agents with social and territorial functions, without necessarily highlighting their food production capacity [23]. Some academic debates around local foods' consumption in Portugal have largely focused on urban centres and food policy constraints [20,24,25].

The lack of a systemic approach to promoting local foods in Portugal hinders the capacity to recognise the real impact of these processes in rural landscapes. A starting point to fill this void is identifying what enables the emergence of local food channels in these areas. For instance, are there territorially specific socio-economic and political conditions that promote or slow down local food production? Once we can point out the driving forces of this trend, it is sensible to discuss any rising concerns regarding the utilisation of local foods. This paper, thus, aims to determine the key characteristics prompting LFS in predominately rural areas in Portugal based on the assumption that LFS' development presents similar trends in rural and urban areas, and to discuss food access issues evolving from this setup.

The paper is structured as follows. First, we present the food access approach as a useful framework to analyse local foods' utilisation, or, in other words, from a consumer perspective. Second, we explain the data sources and analytical methods used. Then, we present the results and discuss our findings. Lastly, we provide our final remarks and suggestions for further research.

2. Conceptual Framework

We start from the fact that food activities (production, processing, distribution, retail, and consumption) occur in agri-food systems composed of a set of actors and relationships

with specific outcomes [26]. Food systems approaches emerged in response to the issues produced by the promotion of concentrated and unsustainable food production regimes which led to the persistence of food insecurity despite increases in food yields, plus a series of social, economic, and environmental effects impacting modern societies [27].

Like any other food system, local food systems (LFS) exist in unique contexts, in conjunction with other food schemes at different scales and levels. We assume the concept of local food to be foodstuffs that are produced and processed in a defined geographical area relatively close to where they are marketed and consumed [28]. The concept of "food geographies" [29] can help unpack the mosaic of materialities, people, places, spaces, and scales within food systems. It aligns with the notion that agri-food systems are territorialised entities with complex dynamics, circumscribed in a particular geographic space and coordinated by territorial governance [30]. We consider that LFS are, ultimately, expressions of territorial governance comprising new spatially bound relationships between producers and consumers, through which territories can be assessed [31].

Andress and Fitch [19] maintain that the food access concept can help disentangle the interactions between the social, cultural, and physical environments in food systems to assess their impact on food provision and consumption. Food access is hereby examined by qualifying the six dimensions of access, as proposed by Saurman [32], pg. 37: accessibility, availability, affordability, acceptability, accommodation, and awareness. These dimensions were adapted to understand the specific issues of local food consumption in rural areas.

Accessibility concerns the elements facilitating whether, or not, local foods are in a reasonable proximity to the consumer in terms of time and distance. Its relevance stems from the assumption that a weak infrastructure for food distribution in rural areas might pose challenges to maintaining high-quality produce, such as local foods, available at rural food outlets [33]. *Availability* considers aspects of local food supply and demand. Specifically, it contemplates the capacity of a territory to meet the food needs of the consumers and communities served and recognises that the main contribution of local food systems is the revitalisation of local food production by (re-)connecting the small producers and consumers of that locality [34]. *Affordability* refers to the capacity that consumers hold to cover the financial costs of local foods. *Acceptability* considers the receptivity of LFS in a particular area, from both a community and a consumer food environment perspective [35]. *Accommodation* hints at the suitability and adaptability of LFS to thrive in a specific context, by looking at how well local food outlets accept and adapt to local residents' needs (i.e., store hours or types of market places), as well as the existing infrastructure for LFS to flourish. *Awareness*, lastly, indexes the kind and amount of knowledge that residents have on the relevance and means of purchasing local foods.

3. Methods

3.1. Data Collection

We used secondary data from the national mapping of local food initiatives in Portugal made by Hernández [36]. This mapping was a targeted online search carried out from November 2020–March 2021, from which we extracted the list of municipalities identified to host local food initiatives in predominately rural areas (N = 74). Predominately rural areas (PR) in Portugal correspond to administrative and geographical units with less than 100 inhabitants per square kilometre [37]. For these 74 municipalities, we collected further statistical data linked to six selected socio-economic and political indicators (Appendix A). The aim was to first find a comparative language to then group the municipalities in clusters based on similar characteristics.

The data source for indicators *pop_dens*, *income*, *high_edu*, and *RD_agri* was extracted from the national statistics, at the municipal and NUTS3 level, to obtain a socio-economic picture of each PR. NUTS3 corresponds to the European nomenclature of territorial units for statistics of small regions for specific diagnoses [38]. The other two indicators (*road* and *agri_profile*) were engineered. Each indicator was selected to correspond to one of the six

food access dimensions discussed above. Table 1 summarises the six indicators guiding data collection.

Accessibility: we used Sanchez-Zamora et al. [39]'s proposed index to understand each municipality's road infrastructure (*road*), taking the total length of motorways (main and secondary) in the municipality and dividing it by the total municipality area. This index is deemed relevant because residents in rural communities often have limited access to food resources due to the infrastructure available in that region [19]. A reduced road connecting system might impact those residents who rely on public transportation options or private vehicle usage to carry out food purchases or home food delivery; these may be, for example, the economically disadvantaged, elder groups, and those living far from medium-size rural cities where local food sales tend to take place [34].

Availability: we created the farming orientation index (*agri_profile*) to grasp the capacity of each region to produce local foods, based on Rivera et al. [40]'s argument that an increased number of small farms (assumed here as holdings < 5 ha) is linked to regional food systems' development. We divided the number of small farms in each municipality by the utilised agricultural area (UAA) occupied by these small farms to infer this index.

Affordability: the indicator of gross mean income per household (*income*) served to determine what the purchasing capacity of residents in each municipality might be, for it is argued that wealthier consumers tend to have much greater access to a wider array of healthy and better foods, such as local foods [41].

Acceptability: we measured the population density (*pop_dens*) in each municipality to assess the impact range of local foods, considering the number of residents living per square meter. This indicator was chosen to examine the argument that LFS often operate in contexts pressured by the intensification of agricultural practices and urbanisation [42].

Accommodation: we looked at the total expenditure in research and development in agriculture to infer the reported investment per NUTS3 region in the agri-food sector, due to the lack of data at the municipal level. Although a more interesting indicator for this paper could be expenditure in innovation, these data were not retrievable statistically for this sector specifically. Therefore, we take the indicator expenditure in research and development in agriculture (*RD_agri*) to gauge the development of local food production systems, considering that the sector should prioritise a transition towards sustainable food systems in Europe [43].

Awareness: we look at the percentage of the resident population aged 15 and over with post-secondary education (*high_edu*) to determine the mean literacy level of the population in each municipality. This variable is relevant because raised interest and sensibility about local food issues, available through awareness campaigns, food events and media platforms, can contribute to the internalised food-specific values needed for consumers to purchase local foods [44]. For instance, Hashem et al. [45] discovered that consumers' awareness of the safety risks linked with pesticide use in agriculture and the industrial food system was related to consumers' interest in buying local foods. It is likely that increased knowledge and information is associated with the degree of competency and willingness to read food labels and ask food-related questions.

Table 1. The socio-economic and political indicators considered in this study (municipal level); our own elaboration.

	Indicator		Description	References	Food Access Dimension
1	road	Road infrastructure density index	Road length (km)/Municipality area (km^2)—value	Own based on Sanchez-Zamora et al. [39,46]	Accessibility
2	agri_profile	Farming orientation index	Relevance of small-scale farming (UAA used by farms < 5 ha/UAA in municipality)—value	Own based on Rivera et al. [40,47]	Availability
3	income	Income per household	Gross mean income declared by fiscal household (HH)—thousand euros	[48]	Affordability
4	pop_dens	Population density	Number of residents in each municipality per square meter—inh/km^2	[49]	Acceptability
5	RD_agri	Expenditure in research and development in agriculture	Total expenditure in research and development (RD) in agriculture, by NUTS3—thousand euros	[50]	Accommodation
6	high_edu	High education level	Percentage of the resident population aged 15 and over with post-secondary education—%	[51]	Awareness

3.2. Data Analysis

We used the IBM SPSS Statistics Software (v.28) to run a one-tailed Pearson correlation test to measure the linear relationship between our selected continuous variables (Table 1). The objective was to detect whether these socio-economic and political aspects were related to one another, or not, to explain the emergence of initiatives prompting local foods' consumption. Correlation coefficients (R) were deemed significant at the 0.05 and 0.01 level for each relationship. For positive correlations, we assumed the two variables increased or decreased together in the same direction, whereas negative correlations implied that the relationship between variables went in opposite direction (namely, when one increased, the other decreased, and vice versa).

For clustering the sample, we used an Excel free template for cluster analysis intended for research and data mining [52], which helped us organise our data into three segments. The cluster structure and set of correlations were further analysed and discussed through the lens of the six dimensions of access proposed by Saurman [32], pg. 37: accessibility, availability, affordability, acceptability, accommodation, and awareness, based on Andress and Fitch [19]'s food access approach.

4. Results

From the diversity across the country, three clusters of rural regions prompting local food consumption were identified. Table 2 contains the summary of the mean values of these three clusters. Cluster A ('meso-urban', N = 5, 7% in sample) corresponded to the smallest group and included municipalities with urban-like characteristics (e.g., the largest income per HH, highest education level, an average population density, the weakest road infrastructure, and hardly any small-scale farming). Cluster B ('dense', N = 26, 35% in sample) included the municipalities with the highest population density, road infrastructure, proportion of small-scale farming, and the largest expenditure in research and development of agriculture, a lower-than-average income per household, and a somewhat medium percentage of the sample attaining high education. Cluster C was the largest cluster ('castaway', N = 43, 58% in sample), and was characterised by low-density

population municipalities, the lowest mean incomes, the bottommost education levels and expenditure in RD in the agri-food sector, and a shallow road infrastructure and number of small-scale farms.

Table 2. Mean values of the six indicators collected for all PR municipalities by cluster.

Cluster	Nº. of Municipalities	Percentage in Sample	pop_dens	income	high_edu	RD_agri	road	agri_profile
Cluster A 'meso-urban'	5	6.8	40.1	19,079	19.95	2832	0.32	0.04
Cluster B 'dense'	26	35.1	69.2	14,335	12.01	3509	0.66	0.37
Cluster C 'castaway'	43	58.1	23.2	13,978	10.78	2674	0.38	0.27
TOTAL	74	100%						
AVERAGE			40.5	14,448	11.83	2978	0.47	0.29

We observed a particular geographic distribution of the 74 municipalities in the sample across the country, according to the three clusters (see Figure 1). For a start, most PR municipalities were in mainland Portugal (N = 73) except for one in the Autonomous Region of the Azores, in Faial Island. Municipalities in Cluster A were characterised by either hosting a small city or by being nearby an urban centre, which could explain the high income and education levels and the limited presence of small farms in this group. A good example of this phenomenon is the municipality of Santiago do Cacém in NUTS2 Alentejo, which neighbours Portugal's second largest port, Sines. As opposed to this municipality, most municipalities in Cluster B were in the northern part of Portugal (in NUTS2 Centro and Norte), apart from two: São Brás de Alportel in the south (NUTS2 Algarve) and Horta in one of the insular regions (NUTS2 Autonomous Region of the Azores). The characteristics and clear geographical location of the members in this cluster were not surprising, as small farms and a higher population density are predominant in northern Portugal. Cluster C was the largest group and occurred transversally across the country, but especially in remote and inland areas close to Spain along Portugal's northern and eastern borders. Municipalities in this subgroup belonged to NUTS2 Alentejo (N = 10), Algarve (N = 3), Centro (N = 17), and Norte (N = 13), in areas lagging economically and demographically. Remoteness might help explain the low population density, post-secondary education, and income levels, as well as the meagre presence of small farms and expenditure in the development of the agricultural sector in the municipalities of this cluster.

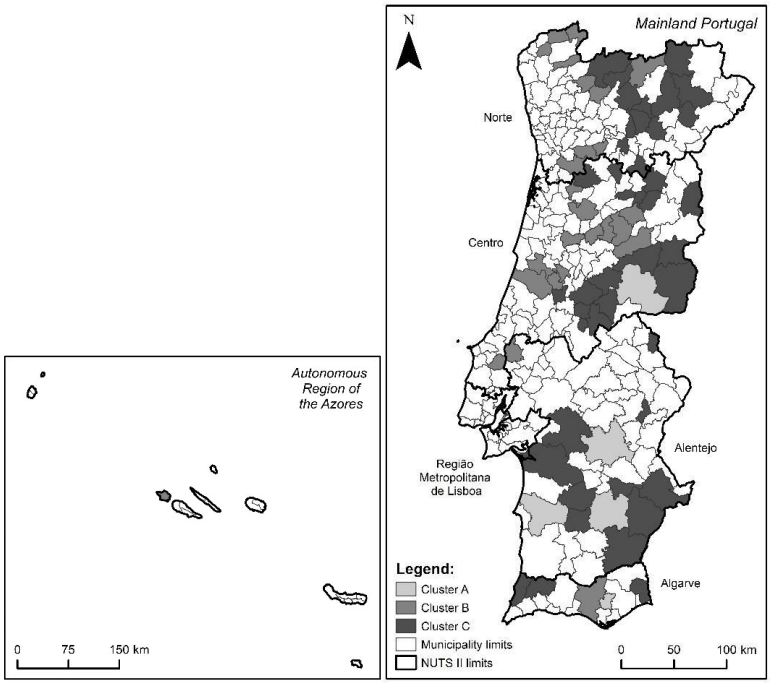

Figure 1. Geographical distribution of the municipalities in the sample according to the three clusters; our own elaboration. (Note: the autonomous region of Madeira is purposely not included in this graph, as it contained no PR municipalities in our sample).

Six correlations (four positive and two negative) emerged in our analysis. Their correlation coefficients informed the intensity of these associations. Most correlations were weak (closer to 0), one was somewhat moderate, and another was strong (closer to 1). We present them below in decreasing order, based on the degree of the relationship between the two variables.

1. *income—high_edu* (R = 0.806): This strong correlation shows that if mean income values increase, so do high education levels (and vice versa). In our sample, this translates to municipalities hosting LFS initiatives with similar income and education levels. Cluster A presented the highest mean values for these two variables, indicating that municipalities labelled as 'meso-urban' were characteristic of having higher incomes in tandem with higher levels of education. In opposition, these two variables had directly proportional low values in Cluster C, where municipalities had low income and low education levels in the cluster 'castaway'.

2. *road—pop_dens* (R = 0.422): A somewhat moderate relationship emerged between the variables of road infrastructure and population density in our sample, meaning that the two variables behaved similarly sometimes. Cluster B showed the highest mean values for both indicators, from which we can infer that more densely populated municipalities often consisted of a better road infrastructure. However, this connection was not akin in clusters 'meso-urban' and 'castaway'.

3. *road—agri_profile* (R = 0.299): A weaker positive correlation between these two variables appeared in our sample, with both indicators increasing and decreasing in tandem. Unlike the item above, Cluster B held the highest values for the two variables, whereas Cluster A had the lowest. This implies that municipalities labelled 'dense' were well connected through the road system and had a high presence of small farms in their territory when compared to the other two clusters. Municipalities named 'meso-urban' were, in opposition, poorly connected and held a meagre percentage of land used for small farming.

4. *income—road* (R= −0.217): This negative correlation was not straightforward, but hints at a weak probability that if the mean income of a municipality increases, its road infrastructure is likely to be poor (and vice versa). This is true for Cluster A, where municipalities had higher incomes but low road infrastructure indexes. Clusters B and C showed the opposite trend. Municipalities with medium level incomes had well-developed road infrastructure systems (Cluster B), whereas municipalities in Cluster C with the lowest mean income values had a less-than-average road infrastructure index.

5. *RD_agri—agri_profile* (R= −0.215): The linearity of the relationship between these two variables was weak, but hints at the opposite behaviour of one variable in comparison to the other. Clusters A and C showed that the weight of the expenditure in RD in agriculture and the presence of small farms were not uniform, but somewhat opposite. On the other hand, municipalities in Cluster B ('dense') were characterised by having both the highest values of expenditure in the sector and of small farms. This signalled the likelihood that if the investment of a region in research and development in agriculture is high, the number of small food farms may also increase.

6. *pop_dens—high_edu* (R = 0.200): The positive relationship found between population density and education levels was weak yet informed us that they could behave similarly. The cluster 'castaway' showed a clear linearity, with municipalities having low-density populations and a meagre post-secondary education attendance. Conversely, Clusters A and B related the other way around, where the fraction of the population attaining post-secondary education increased in medium size municipalities (Cluster A) but was lower in locations more densely populated (Cluster B). Although this correlation is not a straightforward trend, one thing was clear; low densely populated regions tended to host a reduced number of residents with post-secondary education.

Last, we measured the weight of each variable across all correlations, based on the correlation coefficient of each pairing. In sum, we discovered that variables reveal different degrees of relevance, as follows (in decreasing order): *income* (1.023), *high_edu* (1.006), *road* (0.938), *pop_dens* (0.622), *agri_profile* (0.514) and *RD_agri* (0.215). Table 3 presents these results, considering all correlation values in positive to compare the recurrence of each aspect.

Table 3. Relevance of the analytical variables according to the correlation coefficients. Values with (*) correspond to the negative correlations that were turn into positive values to facilitate measurement; our own elaboration.

	pop_dens	**income**	**high_edu**	**RD_agri**	**road**	**agri_profile**	**SUM**
pop_dens			0.200		0.422		0.622
income			0.806		0.217 *		1.023
high_edu	0.200	0.806					1.006
RD_agri						0.215 *	0.215
road	0.422	0.217 *				0.299	0.938
agri_profile				0.215 *	0.299		0.514

Variables *income*, *high_edu* and *road* stood out in association with other variables across all correlations. This means that these aspects, more so than the other socio-economic indicators, were significant in the sampled municipalities. From this, we infer that *income*, *high_edu* and *road* played a relevant role in enabling municipalities to host local food initiatives. This comes as no surprise, for the strongest correlation was identified between gross mean income and post-secondary education levels (*income—high_edu*), and a weak correlation was visible between income and the road infrastructure index of each municipality (*income—road*). The role of the existing transportation infrastructure was deemed relevant too, especially in relation to the demographic pressures in the sample (*pop_dens—road*) and the relevance of small farm production in the municipality (*road—agri_profile*).

Next in significance came population density (*pop_dens*) and the relevance of small farm food production in the municipality (*agri_profile*). The last to emerge was expenditure in research and development in agriculture (*RD_agri*), which, despite including values at the NUTS3 region instead of at the municipality level, signalled its weak association with small farms in the region (*RD_agri—agri_profile).*

5. Discussion

The three sets of clusters identified in our study served to organise the municipalities and shed light on three distinct profiles of territories promoting local food systems in rural municipalities of Portugal. This setup presented interesting geographical trends and six significant correlations among the socio-economic and political variables that were considered. This section discusses the impact of such a combination of factors on local food access in these regions, from a consumer perspective, guided by the six dimensions proposed in our conceptual framework (Table 3). It focuses on the relevance of the variables identified in our results, which we assume could help us discuss which conditions might be enabling and/or hindering the emergence of LFS in our sample.

Following the trends among their urban counterparts, our findings showed three aspects were key characteristics of the rural municipalities promoting local foods in Portugal: consumers' purchasing capacity (*income*), consumers' knowledge and sensibility on food issues (*high_edu*), and consumers' ease of commute (*road*). It is important to stress that none of these aspects can be taken in isolation, but instead are part of a bigger setup composing the intrinsic dynamics of each studied territory. Indicators such as the potential market niche for local foods (*pop_dens*), the relevance of food production by small farms in the area (*agri_profile*), and expenditure in research and development in agriculture (*RD_agri*) had less of an impact in determining the three clusters. However, all are discussed together in this section, as they can impact food access. Figure 2 shows the relevance of variables, based on the correlations identified in Table 3.

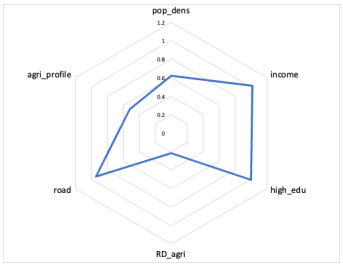

Figure 2. Relevance of the socio-economic and political variables considered in this study, based on the sum of the correlation coefficients.

5.1. Consumers' Purchasing Capacity

Reasonable prices of local food products have been argued to be important for consumers [16], as alongside being a key factor in determining the viability of local food systems [7]. Municipalities in the cluster 'meso-urban' presented the highest mean income values; in other words, they had an economic advantage, and were able to afford more expensive items such as local foods. This condition can be favourable for small food businesses and small producers selling to nearby residents and can enhance the formation of local food networks. The fact that the clusters 'dense' and 'castaway' consisted of residents with lower purchasing capacity could inform us of two things. First, the economic sustainability of small producers selling locally could be compromised, because producers might resolve to sell in niche markets elsewhere for better returns (e.g., urban centres). Second, only residents with the financial means might be able to afford buying local foods, even if this implies sourcing from somewhere else.

On the one hand, the allocation of funding to supporting alternative forms of producing and consuming food in territories with a low-income population requires creativity. This may be, for instance, through finding ways to help producers supply local markets, and through reducing food production costs so that prices may remain affordable for all consumers. This entails shifting specific resources to help new channels to emerge and be sustained; this could be a challenge harder to overcome in the municipalities of Cluster C ('castaway'), which are characterised by both the lowest income and expenditure in RD in agriculture. Besides this, efforts must take a systemic approach that contemplates the ease of reaching local foods and societal improvement, as affordability does not only refer to food prices but also to people's perceptions of worth relative to food cost [19]. Here, one more aspect must be considered: educating consumers about food issues, which sheds light on the strongest correlation in our analysis (*income—high_edu*). From our results, we discovered that municipalities in cluster 'castaway' may resort to additional means to promote LFS other than residents' literacy and purchasing capacity, as these values turned out to be the lowest. By this, we do not imply that access to knowledge about local foods takes place solely in post-secondary institutions, but that citizens with a greater portfolio of information are more likely to be more prone to asking questions and seeking answers.

On the other hand, our findings confirmed that gross mean income is a key indicator for measuring local food consumption in rural areas of Portugal. The cluster 'meso-urban' consisted of municipalities with high-income residents, informing us that local food initiatives in this cluster benefited from this niche market and/or that small food producers can have greater returns in these municipalities. Although the farming orientation (*agri_profile*) of Cluster A did not appear to particularly favour small food producers, the presence of wealthy residents in these municipalities allowed us to speculate two things. First, the local food production output in these municipalities is either very high in response to demographic pressures [53]; or second, a secondary sector might be relevant for adding value to locally produced foodstuffs.

Results sustained that clustering was primarily formed by means of economic wealth, supporting Brinkley's argument that farms involved in direct marketing are more prone to be in areas with high median home values [54], pg. 315. Similarly, restriction on purchasing high-value foods has a direct effect on the opportunities of lower income consumers—largely situated in Cluster 'castaway'—to consume these high-quality products. Due to the low purchasing capacity in this cluster, municipalities might also lack the chance to develop LFS that accompany production, processing, distribution and retailing processes, proving what Forssell and Lankoski [14] argue to be a shortcoming of local foods.

5.2. Consumers' Knowledge and Sensibility on Food Issues

From the correlation test we ran, we discovered there was a strong connection between gross mean income and post-secondary education levels in our sample. Local foods' consumption in municipalities with higher incomes also had better educated populations, in what we assigned as 'meso-urban' sites. According to Anderson [55], higher educational levels tend to favour awareness and support of initiatives that challenge the mainstream food system.

The reduced number of residents with higher education in clusters 'dense' and 'castaway' could reflect the limited ability of consumers in these territories to demand alternative food choices, as "awareness is more than knowing that a service exists, it is understanding and using that knowledge" [32], pg. 138. The lower percentage of residents attaining post-secondary education in clusters B and C suggests they might be missing the chance to consume local foods because of their limited awareness about local foods and where they can be purchased or attained. Awareness becomes the outcome of food literacy (the set of information to which residents are exposed) that is 'content and context specific' and the result of effective communication. Social media has become an efficient informational tool for local food business promotion in urban cities in Portugal [56], enabling the democratisation of information access. However, social media's role in informing consumers about food

quality and production methods is mostly a private endeavour (meaning that it is largely carried out by businesses to communicate with customers), and access to such channels might be limited in rural areas due to restrictions on internet access and digital literacy.

Efforts to counteract reduced levels of food literacy often stem from the role of local actors in stimulating the procurement of local foods, but aspects such as population pressure might play a significant role. In practice, densely populated territories often equate to being heterogenous and more democratic, because diverse narratives regarding access to resources, participation, identity, etc. can congregate and create space for finding solutions and developing alternatives [57]. Our analysis showed a weak and positive correlation between population density and the percentage of residents attaining post-secondary education (*pop_dens—high_edu).* From this, we infer that the denser the population is, the more likely it is to be better informed about food issues, and vice versa. Cluster C confirmed this trend, hosting the least-populated municipalities and the lowest percentage of the population with high education. This condition could jeopardise the development of a more diverse food system that contemplates local food venues and viable dietary options.

5.3. Consumers' Ease of Reaching Local Food Markets

We understand accessibility in terms of the geographic location of the food supply and the physical ease of consumers getting to that location [19]. From our results, we deduced that the most densely populated municipalities had also a well-developed road infrastructure (Cluster B, 'dense'), with a less clear trend in clusters A and C. Notions of physical and temporal proximity in municipalities of Cluster B might help explain this linkage. One the one hand, local foods are mostly exchanged through direct markets that benefit from the spatial density and proximity concept typical of localised food systems [58], pg. 3, for instance, if a market is within walking distance. On the other hand, proximity can be measured in terms of the travelling time of consumers reaching local food venues. Andress and Fitch [19] argue that individuals with their own transportation often have a significantly easier time shopping, especially for high quality foods. A well-developed road system implies that roads connect adequately the territory, but also that transportation facilities (could) exist to grant access to certain services for residents without their own vehicle.

Hinrichs (2000) had already cautioned that rural populations are especially burdened by a greater variation in spatial access to grocery stores, leading them to focus on facilitating access to "exclusive products and exclusive customers", cited in [8], pg. 301. This trend could weigh against the opportunity of low income, rural populations to affordably access the means to eat locally produced foods [19]. Food access in rural communities must, however, be considered carefully, as it can be understood in relation to 'relative rurality', as McEachern & Warnaby (2006, p. 198) cited in [59].

Wenzing and Gruchmann (2018) argued that demographic characteristics might influence consumer perceptions and preferences for local food [16]. In other words, if residents perceive that local foods are at an acceptable 'distance', either physical or temporal, there is a higher chance of them selecting them as food options. Additionally, the short distance between consumers and their food source helps preserve local foods' inherent attributes, such as flavour, authenticity, and cultural or territorial identity, attributes that tend to be lost in long food supply chains [9,58].

Making local foods available through territorially adequate channels can reduce social and territorial disparities, decrease transport costs in remote areas, increase territorial cohesion, and bring consumers closer to their food source [60]. However, aspects such as local food demand and institutional support in each specific territory must be considered to make these services viable for all citizens.

Discussing local foods' availability requires considering the overall supply of local foods determined by production, distribution, and retail processes, as well as the interlinked relationships between these activities [61]. Our results indicated that municipalities in cluster 'dense' have a better road infrastructure and hold a larger number of small-scale

farmers compared to the other two clusters. We assume, therefore, that such municipalities have a larger capacity to supply local foods, since small farms account for a higher share of [local food] production in regions with a higher population density [40]. This larger capacity to produce local foods could be explained by the converging pressure that densely populated territories have on landholding, which can prompt the development of local food production [53].

The positive relationship recognised in municipalities 'dense' between physical proximity (enabled through a well-developed road infrastructure) and food availability (a greater number of small food producers) could hint at a greater offer of local foods. The weaker link between these two variables in the clusters 'meso-urban' and 'castaway' could be indicative of an opposite trend. This is because a limited infrastructure for food distribution (e.g., roads, storage, frequency of delivery) in rural areas might pose limitations to maintaining local food produce availability at rural food outlets [33]. The lowest percentage of small farms and road infrastructure system in the 'meso-urban' municipalities could be explained through the diversification and strong market-oriented service sector that these regions have been able to forge over time. Referred to as "consumption countryside", the evolution in these territories could allow them nowadays to participate in advanced industrial networks and advanced economic markets [62], thus causing less reliance on primary sector activities.

By the same token, disbursement for research and development for the promotion of local foods can play a key role in expanding local food production and enhance business and employment opportunities in the agri-food system [63], with trickle-down effect in the community at large. Our results showed a weak negative relationship between expenditure in RD in agriculture and the weight of small farms in the municipalities of our sample. This might indicate a contradictory signal regarding public support and local food production, especially in Clusters A ('meso-urban') and C ('castaway'), because the lack of a suitable framework that promotes local food production can hinder the capacity of the territory to accommodate its needs (e.g., increased rural food security) and goals (e.g., a more competitive small food production sector).

The cluster 'dense' presented the highest expenditure in the sector, along with the highest presence of small farms, which could hypothetically be explained by a higher demand for local foods (*pop_density*), as well as the ease of connecting small food production and end users (*road*), both of which are characteristic of the denser municipalities of northern Portugal. The higher public investment in research and development in agriculture in cluster 'dense' may be an indication of these municipalities being better suited to develop and adapt infrastructures that can promote local foods' consumption. Similarly, fund allocation to increase food literacy (e.g., via policy tools, research efforts, capacity building, and awareness campaigns, etc.) can empower consumers (or provide the 'knowhow') and promote initiatives (or 'social devices') to increase consumer awareness around purchasing locally grown food products [4,7].

6. Conclusions

To date, most academic debates on local food issues have focused on the evolution of alternative food systems as tools to reconnect small producers and urban consumers, revitalise the countryside, and promote urban food security. Knowledge about the transformative capacity of these systems in non-urban geographical spaces and the consumption of local foods by rural residents are under-researched in Europe and Portugal [12,20,21]. To fill this void, this paper sought to identify which aspects enable the emergence of local food channels in 74 predominately rural areas of Portugal, considering key territorially specific socio-economic and political conditions that can affect the promotion of local food production. Through a statistical analysis of these aspects at the municipal level, we discovered sectoral trends and driving forces. The food access approach of Andress and Fitch [19] was adopted for this exploration, with the guidance of the six dimensions of food access

suggested by Saurman [32]. The findings facilitated discussion of rising concerns regarding the utilisation of local foods by residents in rural areas, through the adoption of

This study was pertinent for examining what might prompt the emergence of local food systems in rural areas in Portugal and proposed a theoretical 'toolkit', or framework, to discuss what might be enabling or hindering consumption of local foods in such areas. The idea was to pinpoint the national trends in the agri-food sector, but it did not attempt to generalise. Our findings showed that specific territorial conditions help define three distinct clusters of predominately rural municipalities promoting local foods consumption in Portugal: 'meso-urban', 'dense', and 'castaway'. The aspects gross mean income and the percentage of residents attaining post-secondary education were shown to be directly linked in determining cluster formation, although the relationship between population density and the road infrastructure of municipalities proofed to be determinant in enabling the accessibility and availability of local foods.

The diversity of rural landscapes enabling LFS emergence could partially be explained through the three sets of characteristics identified in this study; however, they described what may be on the ground and, thus, must be confirmed empirically. For instance, the hypotheses that have arisen from our findings on the ability (or lack thereof) to produce local foods and/or for residents to demand these items need to be assessed and qualified. Interviewing residents in one or more of the municipalities analysed in this study would provide knowledge from a consumer perspective and help identify other aspects affecting consumers' decision-making processes and perspectives on local foods.

Similarly, we argue that other variables could help further knowledge on the drivers of local food initiatives' emergence in these areas and could be explored in future research; these variables could be non-national funding sources and internal factors (e.g., entrepreneurship capacity, foreign investment, cross-border relationships, etc.). For the latter, we encourage exploring specific case studies to attain in-depth knowledge.

Funding: This work is funded by National Funds through FCT—Foundation for Science and Technology under the PhD Scholarship SFRH/BD/146108/2019.

Data Availability Statement: Not applicable.

Acknowledgments: We thank all reviewers that helped improve this paper and the PhD supervisors for their pertinent questions.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A. Data List of the Predominately Rural Municipalities Used in This Study (from Hernández, Submitted)

				Population Density (Pordata, 2019)—inh/km^2	Gross Mean Income Declared by Fiscal HH (INE, 2018)—Thousand Euros	Percentage of the Population with Post-Secondary Education (Pordata, 2021)—%	Expense in Research and Development in Agriculture (IPCTN, 2020)—Thousand Euros	Road Length (km)/Municipality Area (km^2) (ERM, 2021)—Value	Farming Orientation Index (UAA Used by SF/UAA in Municipality)—Value	Clusters (A-'meso-Urban'; B-'dense'; C-'castaway')
	Municipality	**NUTS 3**	**NUTS 2**	**pop_dens**	**income**	**high_edu**	**RD_agri**	**road**	**agri_profile**	**Clusters**
1	Alcácer do Sal	Alentejo Litoral	Alentejo	7.8	15,294	10	1416	0.19	0.002870621	C
2	Alfândega da Fé	Terras de Trás-os-Montes	Norte	14.2	13,121	11	2570.6	0.53	0.206420086	C
3	Alijó	Douro	Norte	35.8	12,113	9	6669.2	0.65	0.334762748	C
4	Aljezur	Algarve	Algarve	17.3	14,245	16	3105.6	0.24	0.098524306	C
5	Aljustrel	Baixo Alentejo	Alentejo	18	18,463	11	4026.1	0.33	0.007760898	C
6	Almeida	Beiras e Serra da Estrela	Centro	11.3	15,061	11	728.8	0.32	0.031785517	C
7	Alvaiázere	Região de Leiria	Centro	41.2	13,455	10	1524.1	0.69	0.635195531	C
8	Ansião	Região de Leiria	Centro	68.6	14,294	12	1524.1	0.61	0.743639922	B
9	Armamar	Douro	Norte	49.3	13,146	9	6669.2	0.42	0.267363245	C
10	Arouca	Área Metropolitana do Porto	Norte	63.2	13,750	11	17,203.8	0.42	0.273455378	B
11	Beja	Baixo Alentejo	Alentejo	29.3	19,417	21	4026.1	0.22	0.007927479	A
12	Borba	Alentejo Central	Alentejo	46.6	15,228	10	4597.5	0.20	0.057574747	C
13	Boticas	Alto Tâmega	Norte	15.6	11,957	9	21	0.51	0.11727563	C
14	Cabeceiras de Basto	Ave	Norte	64.8	12,889	12	1008.5	0.73	0.140706688	B
15	Cadaval	Oeste	Centro	78	15,114	11	4181.8	0.33	0.219287715	B
16	Carrazeda de Ansiães	Douro	Norte	20.3	13,031	10	6669.2	0.40	0.326344708	C
17	Castelo Branco	Beira Baixa	Centro	36.2	18,352	21	1012.3	0.26	0.100355802	A
18	Castro Marim	Algarve	Algarve	20.8	14,763	13	3105.6	0.48	0.111094317	C
19	Celorico da Beira	Beiras e Serra da Estrela	Centro	28.1	14,032	10	728.8	0.35	0.11127056	C

				Population Density (Pordata, 2019)—inh/km^2	Gross Mean Income Declared by Fiscal HH (INE, 2018)—Thousand Euros	Percentage of the Population with Post-Secondary Education (Pordata, 2021)—%	Expense in Research and Development in Agriculture (IPCTN, 2020)—Thousand Euros	Road Length (km)/Municipality Area (km^2) (ERM, 2021)—Value	Farming Orientation Index (UAA Used by SF/UAA in Municipality)—Value	Clusters (A-'meso-Urban'; B-'dense'; C-'castaway')
	Municipality	**NUTS 3**	**NUTS 2**	**pop_dens**	**income**	**high_edu**	**RD_agri**	**road**	**agri_profile**	**Clusters**
20	Chaves	Alto Tâmega	Norte	66.5	15,733	16	21	0.61	0.353344768	B
21	Cinfães	Tâmega e Sousa	Norte	76.7	11,261	7	1104.8	0.42	0.449385475	B
22	Covilhã	Beiras e Serra da Estrela	Centro	84.5	16,092	19	728.8	0.54	0.161598549	B
23	Évora	Alentejo Central	Alentejo	40.1	20,577	25	4597.5	0.24	0.008461726	A
24	Ferreira do Alentejo	Baixo Alentejo	Alentejo	12.1	14,477	10	4026.1	0.28	0.006291845	C
25	Fornos de Algodres	Beiras e Serra da Estrela	Centro	34.6	13,672	9	728.8	0.36	0.369827902	C
26	Fundão	Beiras e Serra da Estrela	Centro	38	14,724	14	728.8	0.40	0.192865193	C
27	Gouveia	Beiras e Serra da Estrela	Centro	88.8	14,122	12	728.8	0.28	0.240493186	B
28	Horta Faial	Ilha do Faial	Região Autónoma dos Açores	84	18,631	16	1430.6	0.69	0.067531603	B
29	Idanha-a-Nova	Beira Baixa	Centro	5.7	13,523	9	1012.3	0.19	0.019834692	C
30	Loulé	Algarve	Algarve	90.1	16,064	16	3105.6	0.44	0.209579133	B
31	Mação	Beira Baixa	Centro	15.7	14,642	10	1012.3	0.35	0.516775396	C
32	Macedo de Cavaleiros	Terras de Trás-os-Montes	Norte	20.8	14,144	14	2570.6	0.52	0.177572965	C
33	Marvão	Alto Alentejo	Alentejo	19.6	14,212	13	1862.3	0.26	0.059742647	C
34	Melgaço	Alto Minho	Norte	34.1	13,078	10	2006.7	0.98	0.110390848	B
35	Mértola	Baixo Alentejo	Alentejo	4.8	13,681	9	4026.1	0.22	0.0024958	C
36	Mirandela	Terras de Trás-os-Montes	Norte	33.1	15,708	16	2570.6	0.51	0.196535167	C
37	Monção	Alto Minho	Norte	84.6	13,854	13	2006.7	1.83	0.36221136	B

				Population Density (Pordata, 2019)—inh/km^2	Gross Mean Income Declared by Fiscal HH (INE, 2018)—Thousand Euros	Percentage of the Population with Post-Secondary Education (Pordata, 2021)—%	Expense in Research and Development in Agriculture (IPCTN, 2020)—Thousand Euros	Road Length (km)/Municipality Area (km^2) (ERM, 2021)—Value	Farming Orientation Index (UAA Used by SF/UAA in Municipality)—Value	Clusters (A-'meso-Urban'; B-'dense'; C-'castaway')
	Municipality	**NUTS 3**	**NUTS 2**	**pop_dens**	**income**	**high_edu**	**RD_agri**	**road**	**agri_profile**	**Clusters**
38	Monchique	Algarve	Algarve	13	13,487	12	3105.6	0.25	0.186892178	C
39	Montalegre	Alto Tâmega	Norte	11.2	12,633	9	21	0.46	0.102299858	C
40	Montemor-o-Novo	Alentejo Central	Alentejo	12.7	16,798	14	4597.5	0.20	0.00514005	C
41	Moura	Baixo Alentejo	Alentejo	14.3	14,636	10	4026.1	0.24	0.020419174	C
42	Murça	Douro	Norte	28.9	12,865	10	6669.2	0.65	0.370162091	C
43	Oleiros	Beira Baixa	Centro	10.7	13,459	9	1012.3	0.35	0.899470899	C
44	Oliveira de Frades	Viseu Dão Lafões	Centro	68.3	14,718	11	1812.9	0.44	0.867631851	B
45	Oliveira do Hospital	Região de Coimbra	Centro	82.3	14,234	12	7931.6	0.72	0.382498236	B
46	Paredes de Coura	Alto Minho	Norte	61.9	13,409	10	2006.7	1.58	0.300616406	B
47	Penacova	Região de Coimbra	Centro	63.5	13,806	11	7931.6	0.81	0.961363636	B
48	Penalva do Castelo	Viseu Dão Lafões	Centro	53.2	13,186	9	1812.9	0.22	0.560758983	C
49	Penamacor	Beira Baixa	Centro	8.5	13,544	9	1012.3	0.21	0.131218558	C
50	Penela	Região de Coimbra	Centro	40.2	14,371	14	7931.6	0.73	0.665357423	B
51	Pombal	Região de Leiria	Centro	82.4	15,433	12	1524.1	0.53	0.705642566	B
52	Ponte da Barca	Alto Minho	Norte	61.5	12,485	11	2006.7	0.91	0.145855567	B
53	Proença-a-Nova	Beira Baixa	Centro	18.6	14,369	12	1012.3	0.37	0.584960422	C
54	Resende	Tâmega e Sousa	Norte	82.6	11,449	8	1104.8	0.28	0.504945341	B
55	Rio Maior	Lezíria do Tejo	Alentejo	74.6	15,349	13	4519.3	0.37	0.228445099	B
56	Sabrosa	Douro	Norte	37.7	12,856	9	6669.2	0.47	0.276830686	C
57	Santiago de Cacém	Alentejo Litoral	Alentejo	27.1	20,188	15	1416	0.29	0.010892466	A

				Population Density (Pordata, 2019)—inh/km^2	Gross Mean Income Declared by Fiscal HH (INE, 2018)—Thousand Euros	Percentage of the Population with Post-Secondary Education (Pordata, 2021)—%	Expense in Research and Development in Agriculture (IPCTN, 2020)—Thousand Euros	Road Length (km)/Municipality Area (km^2) (ERM, 2021)—Value	Farming Orientation Index (UAA Used by SF/UAA in Municipality)—Value	Clusters (A-'meso-Urban'; B-'dense'; C-'castaway')
	Municipality	**NUTS 3**	**NUTS 2**	**pop_dens**	**income**	**high_edu**	**RD_agri**	**road**	**agri_profile**	**Clusters**
58	São Brás de Alportel	Algarve	Algarve	67.9	16,863	18	3105.6	0.59	0.371727749	A
59	São Pedro do Sul	Viseu Dão Lafões	Centro	44.3	14,260	11	1812.9	0.22	0.485466599	C
60	Sardoal	Médio Tejo	Centro	40.6	15,221	11	1002.1	0.54	0.493428913	C
61	Seia	Beiras e Serra da Estrela	Centro	51.2	14,613	12	728.8	0.50	0.301644737	B
62	Sernancelhe	Douro	Norte	23.6	12,306	8	6669.2	0.44	0.344741444	C
63	Serpa	Baixo Alentejo	Alentejo	13	14,245	11	4026.1	0.22	0.018591549	C
64	Sertã	Médio Tejo	Centro	32.7	13,222	10	1002.1	0.46	0.720282069	C
65	Soure	Região de Coimbra	Centro	64.9	16,533	13	7931.6	0.52	0.418841502	B
66	Tábua	Região de Coimbra	Centro	57	13,390	10	7931.6	0.64	0.522657055	B
67	Tondela	Viseu Dão Lafões	Centro	71.3	15,302	12	1812.9	0.49	0.590572191	B
68	Trancoso	Beiras e Serra da Estrela	Centro	24.6	13,843	12	728.8	0.38	0.257000942	C
69	Vidigueira	Baixo Alentejo	Alentejo	17.4	14,675	12	4026.1	0.34	0.023266557	C
70	Vieira do Minho	Ave	Norte	54.8	12,733	10	1008.5	0.82	0.156633907	B
71	Vila de Rei	Médio Tejo	Centro	17.3	13,673	10	1002.1	0.34	0.508196721	C
72	Vila Nova de Paiva	Viseu Dão Lafões	Centro	26.8	13,617	11	1812.9	0.36	0.43917368	C
73	Vila Pouca de Aguiar	Alto Tâmega	Norte	27.4	13,036	10	21	0.55	0.170819113	C
74	Vinhais	Terras de Trás-os-Montes	Norte	11.2	12,416	8	2570.6	0.52	0.177724656	C

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Appendix 9. Data list of the predominately rural municipalities used in this study (from Hernández et al., submitted)

				Pop density (Pordata, 2019) - inh/km2	Gross mean income declared by fiscal HH (INE, 2018) - thousand euros	Percentage of the population with post-secondary education (Pordata, 2021) - %	Expense in Research and Development in agriculture (IPCTN, 2020) - thousand euros	Road length (km)/ Municipality area (km2) (ERM, 2021) - value	Farming orientation index (UAA used by SF / UAA in municipality) - value	Clusters (A - 'meso-urban'; B - 'dense'; C - 'castaway')
	Municipality	**NUTS 3**	**NUTS 2**	**pop_dens**	**income**	**high_edu**	**RD_agri**	**road**	**agri_profile**	**Clusters**
1	Alcácer do Sal	Alentejo Litoral	Alentejo	7.8	15294	10	1416	0.19	0.002870621	C
2	Alfândega da Fé	Terras de Trás-os-Montes	Norte	14.2	13121	11	2570.6	0.53	0.206420086	C
3	Alijó	Douro	Norte	35.8	12113	9	6669.2	0.65	0.334762748	C
4	Aljezur	Algarve	Algarve	17.3	14245	16	3105.6	0.24	0.098524306	C
5	Aljustrel	Baixo Alentejo	Alentejo	18	18463	11	4026.1	0.33	0.007760898	C
6	Almeida	Beiras e Serra da Estrela	Centro	11.3	15061	11	728.8	0.32	0.031785517	C
7	Alvaiázere	Região de Leiria	Centro	41.2	13455	10	1524.1	0.69	0.635195531	C
8	Ansião	Região de Leiria	Centro	68.6	14294	12	1524.1	0.61	0.743639922	B
9	Armamar	Douro	Norte	49.3	13146	9	6669.2	0.42	0.267363245	C
10	Arouca	Área Metropolitana do Porto	Norte	63.2	13750	11	17203.8	0.42	0.273455378	B
11	Beja	Baixo Alentejo	Alentejo	29.3	19417	21	4026.1	0.22	0.007927479	A
12	Borba	Alentejo Central	Alentejo	46.6	15228	10	4597.5	0.20	0.057574747	C
13	Boticas	Alto Tâmega	Norte	15.6	11957	9	21	0.51	0.11727563	C
14	Cabeceiras de Basto	Ave	Norte	64.8	12889	12	1008.5	0.73	0.140706688	B
15	Cadaval	Oeste	Centro	78	15114	11	4181.8	0.33	0.219287715	B
16	Carrazeda de Ansiães	Douro	Norte	20.3	13031	10	6669.2	0.40	0.326344708	C
17	Castelo Branco	Beira Baixa	Centro	36.2	18352	21	1012.3	0.26	0.100355802	A
18	Castro Marim	Algarve	Algarve	20.8	14763	13	3105.6	0.48	0.111094317	C
19	Celorico da Beira	Beiras e Serra da Estrela	Centro	28.1	14032	10	728.8	0.35	0.11127056	C
20	Chaves	Alto Tâmega	Norte	66.5	15733	16	21	0.61	0.353344768	B
21	Cinfães	Tâmega e Sousa	Norte	76.7	11261	7	1104.8	0.42	0.449385475	B
22	Covilhã	Beiras e Serra da Estrela	Centro	84.5	16092	19	728.8	0.54	0.161598549	B

23	Évora	Alentejo Central	Alentejo	40.1	20577	25	4597.5	0.24	0.008461726	A
24	Ferreira do Alentejo	Baixo Alentejo	Alentejo	12.1	14477	10	4026.1	0.28	0.006291845	C
25	Fornos de Algodres	Beiras e Serra da Estrela	Centro	34.6	13672	9	728.8	0.36	0.369827902	C
26	Fundão	Beiras e Serra da Estrela	Centro	38	14724	14	728.8	0.40	0.192865193	C
27	Gouveia	Beiras e Serra da Estrela	Centro	88.8	14122	12	728.8	0.28	0.240493186	B
28	Horta Faial	Ilha do Faial	Região Autónoma dos Açores	84	18631	16	1430.6	0.69	0.067531603	B
29	Idanha-a-Nova	Beira Baixa	Centro	5.7	13523	9	1012.3	0.19	0.019834692	C
30	Loulé	Algarve	Algarve	90.1	16064	16	3105.6	0.44	0.209579133	B
31	Mação	Beira Baixa	Centro	15.7	14642	10	1012.3	0.35	0.516775396	C
32	Macedo de Cavaleiros	Terras de Trás-os-Montes	Norte	20.8	14144	14	2570.6	0.52	0.177572965	C
33	Marvão	Alto Alentejo	Alentejo	19.6	14212	13	1862.3	0.26	0.059742647	C
34	Melgaço	Alto Minho	Norte	34.1	13078	10	2006.7	0.98	0.110390848	B
35	Mértola	Baixo Alentejo	Alentejo	4.8	13681	9	4026.1	0.22	0.0024958	C
36	Mirandela	Terras de Trás-os-Montes	Norte	33.1	15708	16	2570.6	0.51	0.196535167	C
37	Monção	Alto Minho	Norte	84.6	13854	13	2006.7	1.83	0.36221136	B
38	Monchique	Algarve	Algarve	13	13487	12	3105.6	0.25	0.186892178	C
39	Montalegre	Alto Tâmega	Norte	11.2	12633	9	21	0.46	0.102299858	C
40	Montemor-o-Novo	Alentejo Central	Alentejo	12.7	16798	14	4597.5	0.20	0.00514005	C
41	Moura	Baixo Alentejo	Alentejo	14.3	14636	10	4026.1	0.24	0.020419174	C
42	Murça	Douro	Norte	28.9	12865	10	6669.2	0.65	0.370162091	C
43	Oleiros	Beira Baixa	Centro	10.7	13459	9	1012.3	0.35	0.899470899	C
44	Oliveira de Frades	Viseu Dão Lafões	Centro	68.3	14718	11	1812.9	0.44	0.867631851	B
45	Oliveira do Hospital	Região de Coimbra	Centro	82.3	14234	12	7931.6	0.72	0.382498236	B
46	Paredes de Coura	Alto Minho	Norte	61.9	13409	10	2006.7	1.58	0.300616406	B
47	Penacova	Região de Coimbra	Centro	63.5	13806	11	7931.6	0.81	0.961363636	B
48	Penalva do Castelo	Viseu Dão Lafões	Centro	53.2	13186	9	1812.9	0.22	0.560758983	C
49	Penamacor	Beira Baixa	Centro	8.5	13544	9	1012.3	0.21	0.131218558	C
50	Penela	Região de Coimbra	Centro	40.2	14371	14	7931.6	0.73	0.665357423	B
51	Pombal	Região de Leiria	Centro	82.4	15433	12	1524.1	0.53	0.705642566	B
52	Ponte da Barca	Alto Minho	Norte	61.5	12485	11	2006.7	0.91	0.145855567	B
53	Proença-a-Nova	Beira Baixa	Centro	18.6	14369	12	1012.3	0.37	0.584960422	C
54	Resende	Tâmega e Sousa	Norte	82.6	11449	8	1104.8	0.28	0.504945341	B
55	Rio Maior	Lezíria do Tejo	Alentejo	74.6	15349	13	4519.3	0.37	0.228445099	B
56	Sabrosa	Douro	Norte	37.7	12856	9	6669.2	0.47	0.276830686	C
57	Santiago do Cacém	Alentejo Litoral	Alentejo	27.1	20188	15	1416	0.29	0.010892466	A

58	São Brás de Alportel	Algarve	Algarve	67.9	16863	18	3105.6	0.59	0.371727749	A
59	São Pedro do Sul	Viseu Dão Lafões	Centro	44.3	14260	11	1812.9	0.22	0.485466599	C
60	Sardoal	Médio Tejo	Centro	40.6	15221	11	1002.1	0.54	0.493428913	C
61	Seia	Beiras e Serra da Estrela	Centro	51.2	14613	12	728.8	0.50	0.301644737	B
62	Sernancelhe	Douro	Norte	23.6	12306	8	6669.2	0.44	0.344741444	C
63	Serpa	Baixo Alentejo	Alentejo	13	14245	11	4026.1	0.22	0.018591549	C
64	Sertã	Médio Tejo	Centro	32.7	13222	10	1002.1	0.46	0.720282069	C
65	Soure	Região de Coimbra	Centro	64.9	16533	13	7931.6	0.52	0.418841502	B
66	Tábua	Região de Coimbra	Centro	57	13390	10	7931.6	0.64	0.522657055	B
67	Tondela	Viseu Dão Lafões	Centro	71.3	15302	12	1812.9	0.49	0.590572191	B
68	Trancoso	Beiras e Serra da Estrela	Centro	24.6	13843	12	728.8	0.38	0.257000942	C
69	Vidigueira	Baixo Alentejo	Alentejo	17.4	14675	12	4026.1	0.34	0.023266557	C
70	Vieira do Minho	Ave	Norte	54.8	12733	10	1008.5	0.82	0.156633907	B
71	Vila de Rei	Médio Tejo	Centro	17.3	13673	10	1002.1	0.34	0.508196721	C
72	Vila Nova de Paiva	Viseu Dão Lafões	Centro	26.8	13617	11	1812.9	0.36	0.43917368	C
73	Vila Pouca de Aguiar	Alto Tâmega	Norte	27.4	13036	10	21	0.55	0.170819113	C
74	Vinhais	Terras de Trás-os-Montes	Norte	11.2	12416	8	2570.6	0.52	0.177724656	C

Appendix 10. Questionnaire to consumers

Dimension	Question No.	Question	Response	Pergunta	Resposta
Socio-demographic	1	what is your gender?	1) female, 2) male, 3) other	Qual é o seu género?	1) feminino, 2) masculino, 3) outro
	2	what is your age?	1) < 19 yrs, 2) 20-34 yrs; 3) 35-49 yrs, 4) 50-64 yrs; 5) 65yrs <	Qual é a sua faixa etária ?	1) menos de 19 anos, 2) 20-34 anos; 3) 35-49 anos, 4) 50-64 anos; 5) mais de 65 anos
	3	what is your current professional status?	1) student, 2) employee, 3) unemployed, 4) retired	Qual é a sua situação profissional actual?	1) estudante, 2) empregado, 3) desempregado, 4) reformado
	4	What is your highest level of education?	1) No schooling; 2) Cycle 1; 3) Cycle 2; 4) Cycle 3; 5) High school; 6) University	Quais são as suas habilitações literárias?	1) Sem nível de escolaridade, 2) Básico 1o ciclo, 3) Básico 2o ciclo, 4) Básico 3o ciclo, 5) Secundário, 6) Superior, 7) Outro
	5	How many dependents does your household have?	1) 0, 2) 1, 3) 2, 4) 3, 5) 4, 6) 5 or more	Quantas pessoas dependentes tem o seu agregado familiar?	1) 0, 2) 1, 3) 2, 4) 3, 5) 4, 6) 5 ou mais
	6	what is the zip code of your place of residence?	open	Qual é o código postal do seu local de residência?	open
Consumer's behaviour	7	In average, how much money do you spend on food expenses per week?	1) less than 50 euro, 2) between 51-100 euro, 3) between 101-200 euro, 4) more than 200 euro	Aproximadamente, quanto dinheiro gasta em despesas alimentares por semana?	1) menos de 50 euros, 2) entre 51-100 euros, 3) entre 101-200 euros, 4) mais de 200 euro
	8	Identify 3 words that describe what "local food" means to you	open	Identifique 3 palavras que descrevam o que um "alimento local" significa para si	open
	9	Do you incorporate locally-produced food items into your diet?	1) yes, 2) no	Costuma incorporar na sua dieta produtos alimentares produzidos localmente?	1) sim, 2) não

	10	What is your main source for local foods?	1) self-produced, 2) gifted or bartered, 3) purchased, 4) other	Qual é a sua principal fonte para obter alimentos locais?	1) autoproduzido, 2) oferecido ou trocado, 3) comprado, 4) outro
	11	How often can you acquire (whether gifted or purchased) local foods?	1) daily, 2) weekly or biweekly, 3) monthly, 5) on holidays, 6) sporadically, 7) never	Com que frequência costuma adquirir (quer seja comprado ou lhe seja oferecido, p. ex.) alimentos locais?	1) diariamente, 2) semanalmente ou quinzenalmente, 3) mensalmente, 5) nas férias, 6) esporadicamente, 7) nunca
	12	how do you usually get to your local food supplier?	1) by foot, 2) own vehicle, 3) public transportation, 4) a friend, colleague or relative drives you there, 5) food is delivered	Como é que normalmente chega ao seu fornecedor de alimentos locais?	1) a pé, 2) veículo próprio, 3) transporte público, 4) um amigo, colega ou familiar conduzi-lo até lá, 5) a comida é entregue em casa
	13	in average, how far do you have to travel to acquire local foods?	1) less than 5km, 2) 5-20km, 3) 20-50 km, 4) more than 50km, 5) I buy online	Em média, qual é a distância que precisa percorrer para adquirir alimentos locais?	1) menos de 5 km, 2) 5-20 km, 3) 20-50 km, 4) mais de 50 km, 5) compro online
	14	in average, how much time it takes you to reach your local foods supplier?	1) less than 10min, 2) 10-30min, 3) 30-60min, 4) more than 1 hour, 5) I buy online	Em média, quanto tempo leva a chegar ao seu fornecedor de alimentos locais?	1) menos de 10min, 2) 10-30min, 3) 30-60min, 4) mais de 1 hora, 5) compro online
	15	What % of your total food purchases include locally-produced foods?	1) less than 25%, 2) 25-50%, 3) 50-75%, 4) more than 75%	Que percentagem do total das suas compras alimentares inclui os alimentos produzidos localmente?	1) menos de 25%, 2) 25-50%, 3) 50-75%, 4) mais de 75%
	16	what characteristic is most important to you when purchasing local foods? Number the 3 preferred options by order of relevance	1) food quality (freshness, healthiness, seasonality), 2) price, 3) convenience, 4) tradition/heritage, 5) origin, 6) product certification, 7) knowing the producer	Que característica é mais importante para si quando compra alimentos locais? Numerar as 3 opções preferidas por ordem de relevância	1) qualidade alimentar (alimento fresco, saudável e sazonal), 2) preço, 3) conveniência, 4) tradição/património, 5) origem, 6) certificação do produto, 7) conhecimento do/a produtor/a
	17	where do you mostly buy local foods? Number the 3 preferred options by order of relevance	1) at the farm, 2) box scheme, 3) specialty shop, 4) producers´market, 5) catering, 6) fair & festival, 7) super/hypermarket, 8) other	Onde costuma comprar os alimentos locais? Numere as suas 3 opções preferidas por ordem de relevância	1) na quinta, 2) cabaz por entrega, 3) loja especializada, 4) mercado de produtores, 5) restauração, 6) feira e/ou festival, 7) supermercado, 8) outro

	18	How can you distinguish that the food you are purchasing is local? Number the 3 preferred options by order of relevance.	1) I ask the food vendor, 2) I read the labels, 3) I pay attention to signage at store/in the menu, 4) I trust the brand, 5) I acquire from a local producer, 6) other	Como distingue que os alimentos que está a comprar são locais?	1) pergunto diretamente ao/à vendedor/a, 2) leio as etiquetas/o rótulo do produto, 3) presto atenção à sinalética na loja/no menu, 4) confio na marca, 5) adquiro diretamente ao/à produtor/a, 6) other
	19	how do you normally make your local food order?	1) in person from the producer, 2) through the staff/facilities at the grocery store, restaurant, or supermarket, 3) using a social network app, 4) online through a food purchasing platform, 5) other	Como é que normalmente faz o seu pedido de alimentos locais?	1) pessoalmente ao produtor; 2) compro nas instalações da mercearia, restaurante ou supermercado; 3) através de uma rede social; 4) online através de uma plataforma de compra de alimentos, 5) outro
	20	What might hold you back from purchasing local foods?	open	O que o pode impedir de comprar alimentos locais?	open
	21	How satisfied are you with your shopping options for locally-produced foods?	1) very satisfied, 2) satisfied, 3) dissatisfied, 4) very dissatisfied	Até que ponto está satisfeito com as suas opções de compra de alimentos produzidos localmente?	1) muito satisfeito, 2) satisfeito, 3) insatisfeito, 4) muito insatisfeito
Political agency	22	Do you have any form of regular arrangement with one or more local producers to buy food from in exchange for money or work?	1) yes, 2) no	Tem algum acordo regular com um ou mais produtores locais para comprar alimentos, em troca de dinheiro ou trabalho?	1) sim, 2) não
	23	If yes, how do you this establish this arrangement?	1) individually, 2) collectively with neighbors, friends, or members of the community, 3) an external person/entity organizes it, 4) other	Se sim, como costuma estabelecer esse acordo?	1) individualmente, 2) coletivamente com vizinhos, amigos ou membros da comunidade, 3) uma pessoa/entidade externa que organiza, 4) outro
	24	Do you discuss local food issues with people in your community?	1) yes, 2) no	Discute questões sobre alimentos locais com pessoas da sua comunidade?	1) sim, 2) não.
	25	If yes, explain with whom and how often.	open	Se sim, explique com quem e com que frequência?	open

	26	How do you have access to information on local foods? Number the 3 most used options by order of relevance	1) TV, radio or newspaper, 2) marketing campaign at store/market/restaurant, 3) online social network, 4) community-based awareness campaign, 5) through relatives or acquaintances, 6) educational institution, 7) I do not have access to this information	Como é que tem acesso à informação sobre os alimentos locais?	1) TV, rádio ou jornal, 2) campanha de marketing na loja/mercado/restaurante, 3) rede social online, 4) campanha de sensibilização comunitária, 5) através de familiares ou conhecidos, 6) instituição de ensino, 7) não tenho acesso a esta informação
	27	In your opinion, which one of the following actors can help increase local foods in your food basket?	1) producers, 2) small businesses, 3) food industry, 4) local administration, 4) consumer, 5) academia, 6) Local Action Groups, 7) policy-makers	Na sua opinião, quais dos seguintes actores podem ajudar a aumentar os alimentos locais no seu cabaz alimentar? Numere as 3 opções preferidas por ordem de relevância	1) produtores, 2) pequeno comércio, 3) indústria alimentar, 4) administração local, 4) consumidor, 5) academia, 6) Grupos de Ação Local, 7) decisores políticos
	28	What benefits do you believe consuming locally-produced foods has (should have)?	open	Para si, que vantagens acredita que o consumo de alimentos produzidos localmente tem (deveria ter)?	open
	29	what incentives and resources would encourage you to consume and purchase (more) LF?	open	que incentivos e/ou recursos o encorajariam a consumir e a comprar (mais) alimentos locais?	open

Appendix 11. Consent form used for fieldwork data collection.

Caro(a) participante,

Esta investigação está inserida no âmbito da tese de Doutoramento em Geografia, da aluna bolseira Paola Hernández da Universidade de Évora, que tem como foco principal a sustentabilidade dos sistemas alimentares.

A bolsa de Doutoramento é financiada pela Fundação para a Ciência e a Tecnologia, Instituto Público (FCT, I.P.).

Agradecemos desde já a sua participação neste questionário, cujo objetivo é aferir padrões de consumo alimentar em residentes de zonas rurais Portuguesas. Pretende-se assim caracterizar o consumo alimentar, identificar os fatores que o influenciam (preferências e barreiras), bem como analisar as escolhas dos consumidores. A análise da informação recolhida permitirá comunicar aos atores locais e políticos sobre a elaboração de medidas/iniciativas para promoção de uma alimentação mais saudável e sustentável.

A participação neste estudo é voluntária e não implica qualquer risco. Existe a possibilidade de, a qualquer momento, o participante desistir sem qualquer consequência

O presente questionário respeita totalmente a liberdade de escolha de cada participante. É constituído por 3 secções e o seu preenchimento demora cerca de 15 minutos.

A Comissão de Ética da Universidade de Évora concedeu parecer favorável à realização deste questionário. É cumprido o estipulado no Regulamento Geral de Proteção de Dados (RGPD), estando assegurada a segurança, proteção, anonimato e confidencialidade de todos os dados facultados pelos participantes. Os dados serão apenas usados pelos investigadores que participam no estudo.

Caso tenha alguma dúvida, poderá entrar em contacto através do email: paolaher@uevora.pt

Solicitamos que, no preenchimento deste questionário, baseie as suas respostas no seu consumo habitual e padrão.

Agradecemos a sua disponibilidade!
* Obrigatório
Ao participar neste questionário aceito o tratamento e análise estatística dos dados que forneci de forma anónima e voluntária. *

Sim
Não

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