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Integrating Local Food Policies and Spatial Planning to Enhance Food Systems and Rural–Urban Links: A Living Lab Experiment

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Abstract: The development of synergies between rural and urban areas is one of the EU’s objectives to contribute to smart and inclusive growth. Effective governance of rural–urban links is essential for balanced development but often lacks policy coherence. This study examines the role of spatial planning and food policy integration in enhancing local food system sustainability and resilience, specifically in peri-urban areas. It investigates challenges and enablers in this integration through a Living Lab experiment in Lucca (Italy) as part of the ROBUST H2020 project. The Living Lab methodology entailed envisioning, experimenting, and experiencing phases to identify key rural–urban connections and assess governance arrangements, focusing on reclaiming abandoned land in peri-urban areas together with local stakeholders. By highlighting the strengths and limitations of a multi-year collaborative research approach, the research highlights a weak recognition of rural–urban linkages and the need for improved dialogue between rural stakeholders and urban planners. Key recommendations comprise formalising public–private partnerships and cross-sectoral projects linking agriculture with education, tourism, and landscape (e.g., agricultural parks).

Keywords: rural–urban links; food policy; peri-urban agriculture; land use planning



Citation: Galli, F.; Arcuri, S.; Belletti, G.; Marescotti, A.; Moretti, M.; Rovai, M. Integrating Local Food Policies and Spatial Planning to Enhance Food Systems and Rural–Urban Links: A Living Lab Experiment. *Land* **2024**, *13*, 2014. <https://doi.org/10.3390/land13122014>

Academic Editor: Rob Roggema

Received: 18 October 2024

Revised: 18 November 2024

Accepted: 21 November 2024

Published: 26 November 2024



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1. Introduction

Creating synergies between rural and urban areas stands as a focal point in the European regional policy’s New Urban Agenda (2021–2027) and emerges as key within the European long-term Vision for Rural Areas (for 2040) and, more recently, in the Strategic Dialogue on the future of European Agriculture. These recognitions underscore the interconnectedness of rural and urban societies, which rely on shared ecosystems for sustenance and livelihoods. Understanding how “functional” urban–rural linkages unfold in each territory and how to manage them is important to improve the quality of life of both urban and rural populations, reduce regional inequalities, increase resource efficiency, and strengthen the environmental resilience of the territory itself.

Rural–urban relations cover diverse interdependencies categorised by their functions along the peri-urban continuum and by their governance domain [1–3]. These include economic links, like business development [4], public infrastructure, and social services [5]. Cultural links, such as recreational and touristic activities, reflect shared heritage [6]. Ecosystem services, impacted by urbanisation, play a critical role, offering climate resilience by supporting biodiversity, renewable resources, and pollution control [7]. Finally, food systems are deeply intertwined with rural–urban connections.

Food systems serve as a vital connector between rural and urban areas through production, supply chain logistics, and various economic, social, and environmental factors [8].

The dominance of global food chains has raised concerns about negative impacts, prompting the rise of local food networks and urban agriculture to localise food production and consumption [9]. These initiatives aim to reshape rural–urban food relationships at the territorial level. Terms like “rural–urban food links”, “city-region food systems”, and “alternative food networks” are used—often interchangeably—to discuss these connections in policy and academic contexts, underscoring their importance [10,11].

Improving rural–urban links is key for balanced regional development and the well-being of both areas [12]. However, rural–urban synergies are often managed through a mix of uncoordinated governance instruments targeting specific issues, with diverse institutional actors involved, leading to inconsistent interventions [8]. Long-standing policies like urban planning, infrastructures, and rural development coexist with newer initiatives like local food policies. A unified vision and integrated approach among all actors involved are essential to activate beneficial rural-urban relations, requiring synergy across governance instruments for sustainable food systems.

Although the importance of aligning local food system policies with spatial planning is increasingly being discussed at the international level [13], numerous obstacles remain at the local level that hinder practical implementation. Moreover, it is crucial to consider how such policies are developed and implemented, as these processes often emerge from grassroots initiatives and are deeply influenced by the local context.

Our research questions are framed as (1) how can spatial planning and local food policies in peri-urban areas enhance the sustainability and resilience of local food systems while limiting land consumption and preserving environmental and landscape values? (2) What are the main challenges and enablers in this integration process?

This paper examines the governance of rural–urban connections in the peri-urban plain of Lucca, Tuscany, where urban and rural land uses intersect and sometimes come into conflict. Urban expansion has fragmented rural land through dispersed residential and industrial development (as explained in the next sections). The proximity and tension between urban and rural areas, especially amid the growing focus on urban sustainability, present a unique opportunity to develop innovative governance models based on essential ecosystem services, which are crucial for enhancing the quality of life for urban citizens.

We report the experience of a Living Lab, a multi-stakeholder, transdisciplinary process carried out in the framework of the ROBUST project (<https://cordis.europa.eu/article/id/428960-thinking-outside-rural-urban-boxes> (accessed on 24 July 2024)) (H2020). The Living Lab identified sustainable food systems, ecosystem services, and cultural connections as relevant urban–rural linkages and assessed selected governance tools to promote them. The question posed by the Living Lab was: what contribution can spatial planning and local food policy bring to promoting multifunctional and sustainable agriculture and food systems, improving the quality of the environment and landscape in peri-urban areas and curbing the phenomenon of land abandonment and land consumption? (On this specific question, see also [14]).

We aim to contribute to the debate on how rural–urban linkages are characterised and the role of governance integration, reflecting on how spatial planning can support local food policy objectives and what is the potential of local food policy to contribute to integrated spatial planning. The paper continues with a background section that reviews the challenges affecting food systems, peri-urban areas, and the role of different policies (Section 2). Section 3 introduces and describes the case study area and Section 4 identifies and explains the Living Lab approach and methodology. Section 5 documents the Living Lab processes, the main events and activities, and the key results, to be discussed in Section 6. Finally, Section 7 summarises and provides concluding remarks.

2. Background

2.1. Territorial Food Systems and the Challenges of Peri-Urban Areas

Food systems approaches have evolved to capture the complexities concerning the actors, activities, and outcomes involved in and related to food. Food system representations

require multiple choices that ultimately depend on the purpose of the analysis [15]. The literature on food systems focuses on their capacity to guarantee food and nutrition security, as well as delivering other socio-economic and environmental outcomes [16,17]. Different food system models may co-exist at different scales and potentialities, strengths, and weaknesses that can be combined to achieve better overall sustainability of outcomes [18,19].

Territorial food systems—defined as a “set of agri-food sectors located in a regional geographic space” [20]—consider the spatial dimension. This has challenged scholars to reflect on the tools needed for the geographical articulation of food-related activities. This territorial perspective contributes to the complexity of the representation of food systems, as they include both formal and informal markets, layers of intermediaries, traders, and processors, small producers, local processing, etc. [21,22].

By and large, food production has always been linked to rural areas, while the consumption of food is increasingly concentrated in cities as the processes of urbanisation intensify worldwide [23]. From a geographical perspective, food systems show a gradient of rural-urban for each of the food system’s activities [24]. Within food systems, the disconnections between rural and urban areas have been exacerbated by international value chain dynamics, and food delivery from rural to urban areas does not follow linear paths [25]. The decline of traditional markets, the globalisation of diets, the increasing availability of highly processed food, and smallholders’ difficulties in accessing nearby urban areas for markets as they compete with foods at lower prices, produced from distant sources, are all trends that have contributed to disconnecting urban and rural spheres. The City Region Food Systems [25] framework refers to regions that encompass a concentrated urban centre and the surrounding peri-urban and rural hinterland and provide a conceptual framework and tools for experimenting with sustainable food systems.

Peri-urban agriculture is at the interface between rural and urban spheres, and it is debated in relation to its role in enhancing rural–urban linkages and food security, especially in times of crisis [10,26,27]. Multi-functional peri-urban farms provide ecosystem and social services and improve connections between rural and urban areas while reducing past development gaps [28]. Peri-urban agriculture suffers several pressures and drivers of change [29] such as land abandonment and urban sprawl, due to rapid urbanisation reducing available space for farming. Peri-urban areas are places of land use conflict, due to competing demands for housing, industry, infrastructure, and agricultural uses that may face environmental degradation caused by air pollution, waste, and runoff and water scarcity for agricultural purposes. From their perspective, farmers may find it hard to run fragmented lands and access urban markets due to inadequate infrastructure and logistical issues.

2.2. Multiple and Diverse Policies Impact on Territorial Food Systems

Policies can significantly shape the structure, efficiency, and sustainability of territorial food systems, influencing how food is produced, distributed, and consumed across space.

Policies affecting peri-urban land are crucial in managing the intermediate zones between urban and rural areas. There is a significant number of policies that impact these areas: land use planning designates specific areas for agricultural, residential, commercial, or industrial use, aiming to control and direct urban sprawl and preserve peri-urban agricultural lands and open spaces. Green belts may designate areas of protected land around cities to limit urban expansion, maintain natural landscapes, and support peri-urban agriculture [30]. Agricultural parks can serve to support sustainable agricultural practices, preserve green spaces, and promote local food production to offset the pressures of urban development. They also provide educational and recreational opportunities and encourage community engagement for the implementation of stakeholder networks that enable peri-urban agriculture and shared gardening [31,32].

Agricultural policies traditionally provide subsidies and support for farmers to maintain agricultural activities, adopt sustainable practices, and improve productivity but often do not effectively target urban and peri-urban farmers’ needs (<https://environment.ec>

europea.eu/news/more-consistent-policy-support-needed-urban-agriculture-flourish-2023-10-04_en (accessed on 28 May 2024)). From the perspective of the European Union policies, the CAP support measures are applicable to all farmers, including those located in urban and peri-urban areas who fulfil the eligibility criteria, with the exception of rural development measures who include reward mechanisms for farmers located in some specific rural areas (e.g., the LEADER programme). At the European level, rural development strategies increasingly focus on food-related activities like agrotourism, short food supply chains, the relocation of food systems, and ecosystem services [33]. Rural development policies also provide training and technical services to small-scale farmers but the characteristics of peri-urban agriculture are not explicitly recognised [29]. Moreover, the new governance model of EU rural development policies (such as the Italian one) recentralises certain programming functions (that were decentralised previous to the current CAP reform), limiting the possibility of adaptation to local specificities. This also consolidates the need for local/territorial governance tools (such as food districts, biodistricts, etc.) to support relocalisation.

Local or regional governments lack the mandate, jurisdiction, or technical capacity to manage food systems (in its expanded definition). Nevertheless, more and more local governments—cities, metropolitan areas, and regions—are addressing food and nutrition as a response to various economic, environmental, social, and health challenges, with the aim of creating more sustainable, equitable, and resilient food systems at the local level (The Milan Urban Food Policy Pact included in 2023, 265 signatory cities from all over the world (see <https://www.milanurbanfoodpolicypact.org/our-cities/> accessed on 2 November 2024)). Supporting local food systems can spur economic development as money circulates in the community.

A growing stream of the literature is concerned with food policy experiments at the local level to influence territorial food systems, often at the initiative of communities and/or civil society actors [34]. Food-related policy initiatives have proliferated and come under different names, such as food strategies, food plans, food councils, food districts, and food communities, often overlapping and not without ambiguities [35].

Local food policies have multiple and context-specific objectives, from promoting local farmers' markets and community-supported agriculture programmes to establishing local procurement policies for public institutions and promoting education and community engagement in agricultural activities. Local food policies tend to be urban-centred and mainly concerned with the downstream stages of the supply chain, which can neglect the role of (peri-urban) agriculture [35]. Three possible reasons have been identified: first, the difficulty of finding local planning instruments that harmonise with agricultural policies (which are individual, such as direct payments, pesticide bans, and fiscal incentives); second, the prevailing interest of local food policies in alternative food consumption and management, which leads to overlooking conventional and large-scale distribution and retail systems that are crucial to food systems; and third, cities have pioneered food policies and programmes in recent decades, when regional and national policies were still developed in sectoral silos [36].

2.3. Local Food Policies and Spatial Planning: Lack of and Challenges to Integration

Designing policy for the transition to sustainable food systems faces numerous challenges and requires policy integration across multiple sectors and institutional levels (see, among others [37,38]).

Food policy, agricultural policy, and spatial planning should be—in principle—strictly interdependent, with spatial planning providing the physical space for food policy implementation and food policies guiding spatial planning decisions to create resilient, sustainable, and equitable food systems. However, there is often no explicit relation due to the different foci that each one has: agricultural policy mostly targets farmers while landowners and urban planners focus on land use and urban growth, with a limited view on agricultural and food needs, and food policymakers have a limited overview on how

territorial food systems unfold. Some reasons have been identified to explain such reticence: for instance, food is taken for granted in urban areas, as produced in rural areas, and urban planners do not “see” the food system [13,39].

These policies are developed and implemented by separate government bodies and departments or agencies in the same government body with distinct mandates and goals, leading to a lack of coordination and integration. Farmers, urban planners, and food policymakers represent different stakeholder groups with diverse interests and priorities, making it challenging to align their objectives and create cohesive policies. Further, agricultural policy is typically managed at a national or regional level, urban planning at local or municipal levels, and food policy can span local, regional, and national levels, complicating collaboration and policy coherence [38].

The reasons for the lack of coordination and integration are multiple: essentially, there are municipalities, provinces, and regions, and within each of these entities there are specialised divisions. A “vertical” harmonisation problem between the different levels of administration, a “horizontal” problem within the different divisions of the same institutional unit, and a territorial problem, where neighbouring municipalities tackle the same issues with often different and sometimes contradictory logics and instruments. This is a crucial point with regard to food, but it does not seem to be sufficiently taken into account: the urban municipalities, the main consumers of food, do not communicate with the neighbouring rural municipalities, which are normally the producers. The objectives and sensitivities between these two realities are often very different [40].

From the perspective of food policymakers, attempting to understand food systems without reflecting on the set of broader drivers that shape urban development and examining how other policies steer the context in which the food system evolves may prove to be a missed opportunity and result in limited effectiveness. Food policies are, in most cases, participatory policy experiments involving only a subset of all actors involved with food. Local food systems are reshaped by a range of spatial and economic planning decisions and are influenced by developers, entrepreneurs, property managers, and other stakeholders [41].

Spatial planners have to balance competing interests in their land use decisions and deal with various challenges, including demographic and development concerns [42]. In Europe, urban land use is increasing despite stagnating population growth due to changing lifestyles. Demographic change affects both land use and food production differently and reflects the strong geographical differences in the competition for land use. Agricultural soils provide valuable ecosystem services that go beyond food production, such as water regulation, biodiversity, and recreation. To meet the demand for these services, agricultural soils should be protected from urban expansion by integrating them into a comprehensive green infrastructure. While spatial planning plays a crucial role in protecting agricultural land, its effectiveness is often challenged by the continued growth of cities and infrastructure [43]. Finally, soil protection is not an easy task, especially because most land is privately owned. The approaches in spatial planning to land protection are “defensive”, in the sense that they prevent urban land grabbing by providing a specific regulatory restriction, but there is usually no authority to use a “prescriptive” approach by imposing a mandatory alternative land use. As a result, the land may be left vacant if there is no interest on the part of the owner. Sometimes, the interest is merely speculative, waiting for restrictions to be lifted to allow more lucrative urban land use.

3. Case Study: Context and Rural–Urban (Dis)Connections in the Plain of Lucca (Italy)

The area of the plain of Lucca (Tuscany, Italy, see Figure 1) is an interesting context from the point of view of urban–rural relations: the boundary between city and rural areas is not clearly drawn and the peri-urban landscape is characterised by open spaces where agriculture could play a key role in activating or strengthening synergetic relations with the city. However, the pressures resulting from urbanisation, land ownership fragmentation, difficulties in accessing land and water, and interaction with industrial and residential

areas hinder agricultural activity. The result is a loss of importance of agriculture at the urban–rural interface, together with the loss of potential benefits for the area, starting with the functions related to monitoring and maintenance, landscape conservation, environment, and culture.

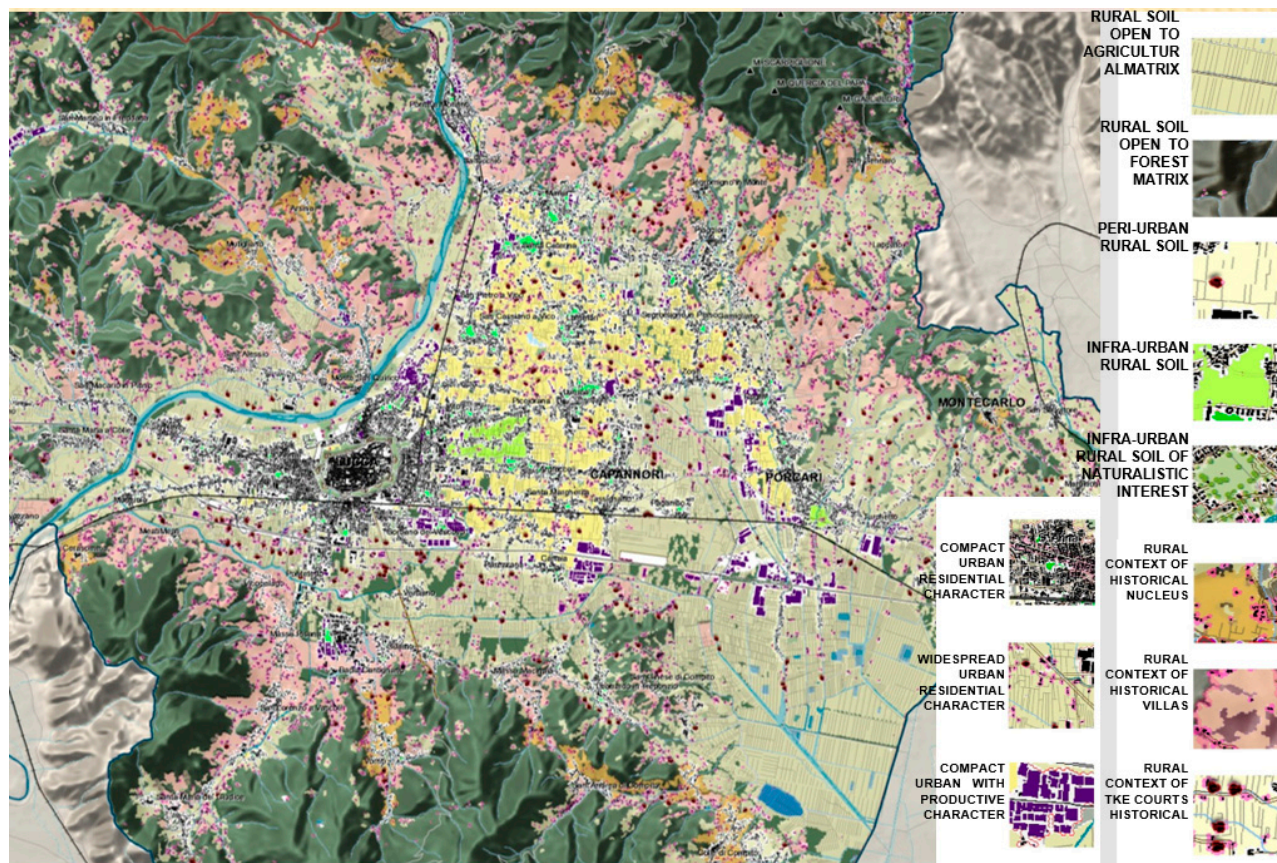


Figure 1. The plain of Lucca. Source: Province of Lucca (2015).

The plain of Lucca includes five municipalities (Lucca, Capannori, Porcari, Villa Basilica, and Montecarlo) and is one of the three areas that make up the Province of Lucca, together with Versilia on the west coast and the Serchio Valley (which include Media Valle del Serchio and Garfagnana) to the north. Around 160,000 people live in the plain on a total area of around 430 square kilometres. The plain of Lucca is dominated by the urban polarity of Lucca city, which develops to the west. A radial road branches off from the urban centre, surrounded by a discontinuous settlement system which is often dispersed in the agricultural area of the plains, determining the close relationship between urban and rural, described above. Urban, peri-urban, and rural areas are contiguous, and economic development since the 1950s has created the basis for a continuous movement of people between and within these areas, partly due to the growth of a system of small and medium-sized enterprises in peri-urban areas. The manufacturing industry is mainly located to the east, with the “paper district” of Capannori and Porcari contributing to 70% of the national paper production by more than 130 small and medium-sized enterprises. Agriculture is carried out by small to medium-sized farms, which help to maintain a varied productive landscape.

Despite the pressure of settlement, the landscape has retained the character that resulted from the old system of villas and farms that once dominated the landscape (these were the main agricultural farming models: the system of villas with attached sharecropping farms was predominant in the hills; the system of farms, in which several, often related, families lived and farmed small plots of land, was more widespread in the plain).

In the plain of Lucca, the link with these models of rural land management is still very strong and can be perceived through the widespread presence of a peasant heritage that is still preserved today (although often adapted to new functions), in which the local culinary traditions and culture, as well as long-lived agricultural practices, have been maintained.

The plain of Lucca has a clearly defined historical, cultural, and landscape identity—a coherent “locality” in material and imaginary terms [3] and as such is recognised by the Tuscany Region Landscape Plan as a distinct landscape area (Lucchesia). It can also be considered a “city region”, comprising both urban and rural areas centred around a large city, with the latter exerting economic and political influence over the area. While the historic centre of Lucca is an attraction of surprising beauty, the development of infrastructure—e.g., hospitals, recreational, administrative, and commercial areas—within the city is no longer possible and requires decentralisation to the peripheral areas, which were often previously used for agricultural purposes.

Over time, the expansion of settlements in the plain of Lucca poses a threat to the agricultural land surrounding the city. This has an impact not only on the landscape but also on the provision of other important ecosystem services, including the production of traditional crops such as fruits and vegetables that made the plain almost self-sufficient in the past. Added to this is the phenomenon of the abandonment of cultivation by farms due to low profitability and increased bureaucratic constraints.

4. Methodology: The Living Lab Approach

This research was developed following a multi-stakeholder approach using the Living Lab (LL) methodology, which is increasingly being used to address challenges related to agri-food systems and rural areas [40,44,45]. LLs function as a “platform for policymakers, researchers, citizens, businesses and other stakeholders for joint learning, collaboration and value creation” (European Network of Living Labs). The advantages of the Living Lab approach are mainly linked to the participatory, real-world focus, which fosters user engagement for innovation. While it allows for addressing complex, context-specific challenges, it should be acknowledged that it requires significant time and resources compared to other qualitative research methods (e.g., surveys and interviews), and the involvement and coordination of participation can be difficult [46].

The LL methodology, consistent across the ROBUST project (<https://rural-urban.eu/sites/default/files/FINAL%20ROBUST%20WP3%20Synthesis%20report.pdf> (accessed on 29 May 24)), entailed three broad phases [47]: (i) The *envisioning phase*, aimed at identifying rural–urban links, developing goals/visions, defining the agenda, and agreeing on key outcomes of the LL. (ii) The *experimenting phase*, which involved field research, data analysis, knowledge gap identification, and engagement with local stakeholders. (iii) The *experiencing phase* entailed focusing and deepening the analysis with the objective of co-producing knowledge and ideas with LL partners for innovation and co-learning. The fourth phase of the project focused on monitoring and evaluation, applied across all LL to analyze and assess interactions and ongoing activities. This included internal LL meetings, a final focus group with an external interviewer, and self-evaluations addressing the challenges and opportunities within the LL. However, the detailed results of this phase are not covered in the paper and are instead presented in [40].

It should be noted that these phases were not linear but were recursive, as the LL members needed to adapt to the changing conditions in the local context (e.g., political elections, changes in the team, external events, etc.). Table 1 summarises methods and key activities completed over the timeframe of the project with reference to each phase.

The outcome of the collaboration between the academic and institutional partners is reported in an open-access document in the form of a guideline for practitioners and policymakers (the guideline’s title is “Connections between Urban and Rural. Synergies and governance tools to enhance peri-urban areas”, available in Italian at this link: https://zenodo.org/records/6479079#_ym_UYy8RrfZ, accessed on 20 November 2024), which reports further details on the activities carried out by the Living Lab.

Table 1. Synthesis of the Living Lab activities over the four years of the project.

Phase and Objectives	Methods Used	Key Activities and Decisions
Envisioning	Document analysis Internal meetings of the LL Bilateral meetings with selected stakeholders Public event with press	Sharing of ideas, identities, and expectations among LL members. Preliminary identification and quick scan of rural–urban links and selection of governance tools (summer 2018). Sign of the Milan Urban Food Policy Pact by the Province and the Mayors (May 2018). Identification of the dual “core” of the LL: the local food policy and the spatial planning departments. Formulation of the ambition and agenda.
Experimenting	Internal meetings of the LL Bilateral meetings with selected stakeholders Focus groups Workshops	Identification and discussion of rural–urban exemplars, with barriers and enablers, with local stakeholders. Support for the process of elaboration of the Intermunicipal Food Policy. Support for the processes of urban planning. Decision to refocus the LL on the potential of open and agricultural spaces and abandoned land in peri-urban areas.
Experiencing	Internal meetings of the LL Secondary data collection and analysis Participant observation Internal meetings of the LL Online workshops with selected stakeholders	Mapping the current state of farmland in the plain of Lucca, data collection and elaboration. Assessment of governance models for peri-urban land in the plain of Lucca and the exploration of opportunities (revision of activities in 2020 due to COVID-19). Development of written guidelines to inform policy processes.

5. Results

This section presents the LL interactions phase by phase, reporting on the main events and documenting processes and key results, which will be discussed in the following Section 6.

5.1. Envisioning Phase: Understanding Rural–Urban Links in the Plain of Lucca

The start of the Living Lab in 2018 involved the first phase of reciprocal observation. Initially, our Living Lab consisted of a group of academics and members of the spatial planning department of the Province of Lucca (Universities of Pisa and Florence and the Province of Lucca were partners of the ROBUST project consortium (see <https://cordis.europa.eu/project/id/727988/reporting/it>, accessed on 20 November 2024)). It took some time and several meetings at the premises of the Province of Lucca for the academics and the local public authority partners to engage with each other and align their visions, ambitions, and expectations, as they had not worked together before. The Living Lab had to develop its agenda to enable collaboration and to ensure the effectiveness of the process. The Province of Lucca coordinated the Living Lab with the support of academic partners and involved the other municipalities working on various topics.

The recognition that agriculture and food play a key role in shaping landscape, identity, and culture in the entire province, together with marked sensitivity to sustainability, were shared starting points in the LL. A quick scan of rural–urban links and governance arrangements was developed by means of desk research (more details and pictures are available here: <https://rural-urban.eu/living-lab/lucca/live-cases>, accessed on 20 November 2024). Numerous initiatives were ongoing, led by the municipal authorities, civil society, farmers’ organisations, and businesses. Despite a lively environment, there was a growing awareness that these initiatives were fragmented and lacked an overarching vision and a shared project.

This view was politically supported by the president of the province, who initiated a policy process to enable a systemic approach to food and to capitalise on the synergies that can arise from the integration of policy areas around agriculture and food. This led to the decision to officially launch the process in May 2018 with a kick-off event at which the

Province of Lucca (together with the municipalities of Lucca and Capannori) signed the Milan Food Charter and informed citizens (in attendance and via the local media) about the Living Lab's activities over the coming years. The Living Lab, as part of the ROBUST project, served the purpose of building on existing initiatives and facilitating integrated visioning and planning.

The provincial administration was supported by academics in establishing a dialogue between urban planning and local food policy processes considering the different institutional levels (i.e., province and municipalities but also regional authorities depending on the subject matter and competences).

5.2. Experimenting Phase: Identification of Rural–Urban Interactions and Local Involvement

In June and September 2019, direct involvement with stakeholders of the local area took place, aimed at identifying the initiatives that create a link between urban and rural territory. Focus groups and workshops were carried out to identify the factors that facilitate or hinder ongoing or activable initiatives in the area in relation to the local food system, culture, and ecosystem services (Appendix A).

The plain of Lucca is confirmed to be rich in civic initiatives—largely related to food—that provide fertile ground for a deeper reflection on the use and valorisation of peri-urban areas. In creating synergies between urban and rural areas, farmers' markets, solidarity purchasing groups, food education initiatives in schools, and the procurement of food from short supply chains for school canteens, along with the role of wine and oil routes, forms of rural tourism, and cultural events on food, play an important role. These initiatives offer opportunities to generate economic, social, cultural, and environmental value. However, they are not always adequately recognised: despite their proximity to urban centres and potential local markets, farmers often struggle with land fragmentation, difficult access to land and water, and challenges in coexisting with residential or industrial areas.

In light of the above collective discussions, several internal meetings between the academics and the province partners took place. During this phase, the LL partners focalised that two processes were moving on in parallel: on one side, the Intermunicipal Food Policy for the Plain of Lucca was developing as a strategic governance instrument, activating different strategic actions (e.g., lifestyles, local production, food access and food waste, school and food education, urban agriculture, etc.). A dedicated office for food policy was established in the municipality of Capannori, with the aim of coordinating future activities. The governance model—and specific regulations—that could best suit the needs emerging from the territory was discussed in depth and formalised. This has led, in recent years, to the development of a local food policy [48]. The province and the municipalities of the plain of Lucca were renewing the territorial planning tools required by law 65/2014 (i.e., the operational land use plan for the municipality of Lucca, the structural plan for several municipalities, and the territorial coordination plan for the Province of Lucca).

Overall, many activities were underway, but the political processes were not linear, both on the side of the food policy development and the urban planning process (e.g., elections forced an interruption). There was concern that the LL would lose focus and effectiveness and the risk that the efforts made would be lost.

It became clear that the integration between the nascent Food Policy Plan and the current processes for territorial planning was desirable, especially when considering that agriculture and food are the pivot elements around which most of the rural–urban interactions identified revolved. Therefore, the decision was made to better focus the topic and activities of the LL. The LL decided to concentrate on the potential of open and agricultural land in peri-urban areas, with specific attention to abandoned land and its roles in improving urban–rural relations. Specifically, the reformulation of the Living Lab's ambition was: "To develop a local food policy and a territorial plan to counter urban expansion, guide the synergies between city and countryside and enhance the cultural heritage, the landscape and the territory".

5.3. Experiencing Phase: Activating Rural–Urban Synergies Through Governance Arrangements

This last phase, marked by the outbreak of the COVID-19 pandemic in 2020, revolved around evaluating the most effective governance arrangements. In line with the ROBUST project, a governance arrangement is a multi-actor process and a collaborative system of planning and decision-making, characterised by significant autonomy and shared resources and power [2,13,46]. Governance arrangements are characterised by a common goal and strategy that require appropriate institutional and organisational arrangements, beyond the established architecture of government authority.

This phase initially entailed dedicated data collection and analysis to inform the discussion with policymakers and stakeholders and, after, the organisation of dedicated workshops to identify ways forward in the governance of peri-urban land. The final aim was to write a set of guidelines to support future policy decisions.

5.3.1. Data Analysis

There was a need to inform the discussion on governance arrangements and the current status of peri-urban land use. Therefore, data collection was carried out to characterise land use dynamics, with particular attention to the role played by agriculture in this context. We present a brief summary of the key outcomes (detailed information can be accessed in the guidelines developed by the LL mentioned above).

- Land consumption: the analysis of the evolution of land use classes shows that approximately 314 ha of agricultural and forestry land were consumed (data available between 2007 and 2016), eroding the agricultural areas by approximately 1.4%. This consumption is widespread and perpetuates a model of settlement dispersion.
- Area occupied by professional agriculture (identified as the agricultural surface managed by professional farms, i.e. farms registered in the ARTEA, the regional system for accessing support from the Common Agricultural Policy): data illustrate a limited spatial distribution of professional agriculture; out of a total of approximately 18,926 ha of agricultural land, 6219 ha are cultivated by structured agribusinesses (approximately 1/3 of agricultural land), whereas 2/3 are entrusted to hobby farmers who do so for income integration.
- Analysis of farms' cultivation plans shows that agriculture is strongly orientated towards the incentives of the Common Agricultural Policy: in both 2016 and 2019, the most common form of use is set-aside, followed by forage and permanent pastures. Olives and vines are only widespread in hilly areas. Fruit and vegetable cultivation is not very widespread. The widespread use of fodder crops and pastures contrasts with the disappearance of livestock farming.
- Active farms in 2019 were 800, and among these, 554 had a dimension below 5 ha. Large farms (greater than 59 ha) only number 24, even if, in spatial terms, they manage 31% of the professional agricultural land, potentially playing a fundamental role in the policies for the valorisation of rural territory. Available data do not allow to have the perception of an increasingly widespread phenomenon in Tuscan agriculture, namely the concentration of the management of land resources by a few actors (contractors) who go in search of land to cultivate, optimising the use of machinery. Probably, many of those 554 small-sized companies (but also larger companies) have now delegated the management of their land to the contracting companies (or to large-sized agricultural companies) with informal contractual agreements while keeping the CAP premium.
- Overall, the plain reports a prevalence of small-sized companies, a high diversification of cultivation systems with a prevalence of low-intensity systems and a limited diffusion of organic farming (only 29 companies for a total surface area of less than 300 ha), and the presence of an equal number of companies with a similar surface area in the conversion phase.
- The fragmentation of land into large farms and the tendency of smaller farms to have their land farmed by other farms or by contractors means that instruments

must be found that promote not so much the consolidation of land ownership as the management of the land resource itself.

- The increase in abandoned agricultural land is causing problems in land management. From surveys carried out in the peri-urban agricultural territory between the municipalities of Lucca and Capannori, for 1 ha of agricultural land conducted by professional farms, there are about 0.37 ha of abandoned agricultural land (ARTEA data) and/or in the process of reforestation whose recovery to its original function will be impossible due to the high costs that will have to be incurred.
- If, on the one hand, the conversion of agricultural land into fallow land makes it possible in any case to guarantee some ecosystem services, such as the habitat function for some species, water infiltration capacity, the absorption of CO₂, etc., on the other hand, other ecosystem services provided by agricultural land are lost and/or reduced (e.g., food production, hydraulic regulation, and/or landscape quality). The result is, therefore, a reduction in the effectiveness of territorial resource utilisation, which is then interpreted in public opinion (and by policymakers) as “worthless” land that could be better utilised through development, leading to the above-mentioned phenomena of settlement dispersion.
- One last aspect that was researched was related to food self-sufficiency and the potential of demand in steering the local food system; the difference between the potential quantities produced and the (estimated) quantities consumed within the Province of Lucca. The analysis was carried out using ISTAT statistics for production and EFSA (European Food Safety Authority) average consumption to quantify the demand for food. Data show, as expected, that there is a deficit for the main food categories, which is particularly negative for meat, fruits, and vegetables. This data collection was developed as part of another European project called SALSA—Small farms, small food businesses, and sustainable food and nutrition security—and the results were published in [49]).
- A final aspect in relation to fruit and vegetable production is the presence of traditional products with a high symbolic, cultural and identity value, such as the Canestrino tomato, the Lucca onion, and various types of beans. These are fruit and vegetable products that, for the most part, are placed on the market by the local Cooperative (*Unitaria*) to which about 42 farms in the Plain of Lucca deliver their products.

5.3.2. Discussion with Stakeholders on Governance Arrangements Integration

This phase of the Living Lab aimed to evaluate the opportunities and limits of some existing forms of governance (which emerged during the previous workshops) with a view to identifying possible forms of institutional innovation useful to the territory. Three online workshops were organised between June and September 2020 in online mode (following the outbreak of the pandemic). They focused on three governance arrangements and were aimed at seizing the synergies between city and countryside for the effective management and enhancement of abandoned agricultural land in peri-urban areas.

At the basis of these discussions, there was the awareness that there is not a single governance tool for the management of the problem addressed but a set of tools, each of which can contribute to addressing particular aspects, especially if these tools are coherent and integrated with each other. Among the governance arrangements to be discussed with stakeholders, we selected:

1. The limits and opportunities of the current territorial planning tool to be implemented at the provincial level (according to regional law 65/2014) and its ability to implement strategies for the enhancement of the rural territory with a view to strengthening urban–rural connections (first workshop).
2. The Intermunicipal Food Plan as an example of public–private collaboration to build a local food strategy among the five municipalities of the Plain of Lucca (second workshop).

3. The land bank established by the Tuscany Region (established by Regional Law 80/2012) for the activation of more effective management of the land resource avoiding the phenomena of abandonment (third workshop).

We are aware that this is a partial choice, since other fundamental policy instruments also operate in the area such as, for example, the Rural Development Plan (RDP), a tool through which farms can apply for funding for business investments but also for landscape improvement and ecological infrastructure interventions. However, the RDP has some limits that are difficult to overcome: on the one hand, it operates from a sectoral and company perspective, and on the other, its direction is now national and regional; these reasons do not allow much room for manoeuvring to meet the specificities of the territories.

Overall, 28 participants—in addition to the seven members of the province and the university research group—attended these three workshops. Stakeholders represented veterinary scientists, the reclamation consortium, farmers' unions, the agricultural high school, the Regional Land Bank, academics, the third sector, land planners of the Lucca Province, members of the Municipalities, agronomists, and local landowners.

This exercise was developed in three steps, according to a visioning and backcasting approach:

1. To define a shared vision for the future of peri-urban areas in the Plain of Lucca with a time horizon of 2050, dedicated Living Lab workshops were held at the headquarters of the Province of Lucca. The vision was developed by the core team and subsequently discussed with about thirty participants in the workshops held in the summer of 2020. The following question was posed to the participants: what are the actions to be developed so that the desirable future framework reported in Appendix B can be achieved in the territory of the Plain of Lucca?
2. The description of the role that the selected governance arrangements may have in pursuing the vision outlined above. The aim is to identify the problems, their implications, and the necessary or desirable changes.
3. Reflection on possible solutions/innovations that could help to better develop synergies between rural and urban actors. To be concrete, it was a question of answering questions such as: what elements/tools/actions are missing to reach the vision and what needs to be done to bridge the gap between vision and reality?

Table 2 reports the summary of the discussion that took place during the three workshops on governance arrangements with reference to the main problems and needs to address as well as a set of suggested actions.

From the discussion in the first workshop (on spatial planning), it emerged that the multiple spatial planning tools (Provincial Coordination Plan (PTCP); the Intermunicipal Structural Plan of Capannori, Porcari, Altopascio and Villa Basilica; and the Operational Plan of Lucca) must find consistency and synergy with each other. In Tuscany, the planning arrangements provide (art. 1 letter a—Regional Law 65/2014) the conservation and management of the territorial heritage, promoting its enhancement in the function of sustainable local development and (art. 6—Regional Law 65/2014) the drafting of the statute of the territory, which is the act through which the local community recognises its territorial heritage and identifies the rules for its protection, reproduction, and transformation. Specifically, art. 90 of Regional Law 65/2014, concerning the purpose and tasks of the PTCP, paragraph 5 (letter a), calls for the definition of the territorial heritage with reference to the rural territory. It is, above all, paragraph 6 that offers interesting opportunities by stating that the strategic part of the PTCP indicates the project lines of territorial planning and outlines the strategy of territorial development and, to this end, “[..] e) identifies strategies for the active protection of the territorial heritage, also for the purpose of the socio-economic and cultural development of the provincial community”. Furthermore, in LR 65/2014, art. 67—Peri-urban areas, and art. 68—Quality of the rural territory, explicit reference is made to the need for integrated policies (planning and sectoral policies) to promote “the support of forms of agriculture that can be usefully integrated with urban settlements, including social gardens and multifunctional agriculture, safeguarding the elements of

the rural landscape still present [...] in coherence with the elements of the rural landscape, guaranteeing the role of ecological connection of these areas and the ecological and fruitive connections between the urbanised and rural territory”.

Table 2. What problems and needs can be addressed by local food policy and spatial planning?

Governance	Main Problems and Needs to Address	Suggested Actions
Intermunicipal Food Policy	Remove obstacles and barriers that prevent farmers from obtaining an adequate income from agriculture and related activities (multifunctionality). Promote the increase in farm profitability; improve farmers' skills and competencies in relation to both new technologies and land/agricultural management.	<ul style="list-style-type: none"> • The Intermunicipal Food Policy promotes the establishment and updating of a local inventory of farms and their products (based on best practices, e.g., the Atlas of Local Food of the city of Turin). • The inventory feeds a list of suppliers for food catering procurement. • Farmers included in the inventory are provided with support in relation to e-commerce, food safety legislation, management, and marketing skills according to their needs • Undertake a public information campaign aimed at citizens, schools, restaurants, tourism and hospitality operators, restaurateurs, and retailers to raise awareness of the role of a sustainable city-region food system. • Analyse the food metabolism of the territory to analyse consumption and production in relation to the different types of plant and livestock production to highlight strengths and weaknesses. • Enhance peri-urban agricultural areas and support social inclusion in food networks. • Redefine the logistics of food networks in the territory.
Spatial planning	Define new rules to avoid land consumption or reduction in arable agricultural land. Reinterpret the existing regulatory framework and activate flexible/strategic tools to strengthen the strategic role of the provinces in enhancing urban–rural synergies.	<ul style="list-style-type: none"> • Overcome the vision of art. 4 of LR 65/2014 so that urban areas can also be recovered, redeveloped, regenerated, etc., to enhance ecosystem services. • Plan an ecological network that also considers land uses that do not involve human activities (e.g., parks and protected areas). • Introduce assessment methods to highlight the role of agricultural activities in combating land consumption and sealing new (agricultural) land (e.g., the identification of areas where high-quality agricultural production takes place as a brake on land consumption). • Monetary evaluation of ecosystem services provided by farms, landscape conservation measures, etc., to be introduced within planning tools. • Create a strategic vision to encourage micro-activities and projects to define an innovative PTCP in socio-economic and environmental content.
Regional Land Bank	Remove barriers and obstacles that prevent public authorities and private landowners from effectively managing or lending vacant/unused/abandoned agricultural land. There is a need for tools to achieve a better match between land supply and demand in order to prevent abandonment and improve access to land.	<ul style="list-style-type: none"> • Awareness campaigns on the importance of land and soil for the provision of ecosystem services, the role of multifunctional agriculture, and issues related to land abandonment and increasing land consumption rates. • Activation of projects (e.g., using EU funds) to involve municipal and regional authorities, which involves third-sector organisations (e.g., Camaiore Social House Agency). • Enforce the obligations of landowners to take care of abandoned/unused land and, above all, hydraulic–agricultural arrangements (ditches and drains) to prevent damage. • Provide tax incentives to landowners who give up unused land in the experimentation of operational models to improve access to and the management of land. • Overcome bureaucratic, financial, and cultural barriers in this aspect.

The discussion in the second workshop highlighted how the Intermunicipal Food policy aims to address the various problems of the local food system in an integrated manner by working for the creation of a sustainable system from the point of view of equity, security, and in the use of agri-environmental resources. Among its objectives, it has

identified the need to strengthen the link between local production and local consumption through awareness-raising and education actions towards citizens and farmers but also by activating concrete actions to strengthen short supply chain circuits. It recognises the importance of promoting the maintenance of vital agriculture in a production context, which presents several critical elements (i.e., small, often fragmented farms, led by elderly farmers and not very competitive in global markets). To achieve this goal, priority is given to actions aimed at increasing citizens' interest in the consumption of local products and also in the knowledge of the peculiarities of some traditional productions of the area that are in danger of disappearing and which, conversely, are important for maintaining agro-biodiversity. In addition, the presence of agriculture in peri-urban areas can also contribute to maintaining an adequate level of production of ecosystem services (water recycling, ecological connections, biodiversity, hydraulic regulation).

Finally, the discussion during the third workshop insisted on the adaptation at the local (i.e., intermunicipal) level of the Regional Land Bank, suggested in order for it to be closer to the needs of citizens. This would help to raise awareness on the role of agricultural land in the provision of ecosystem services and, in particular, for food production; incentivise landowners who do not use agricultural land through tax bonuses and encourage owners of agricultural land to respect the maintenance requirements for abandoned/unused land in order to avoid damage and environmental degradation and activate youth entrepreneurship projects in the field of multifunctional agriculture.

This phase of the LL included a reflection on the governance models for peri-urban land in the plain of Lucca, an exploration of opportunities, and the development of written guidelines to inform policy processes. On one hand, the development of the first point was strongly influenced by the effects of the COVID-19 pandemic, which did not allow us to pursue face-to-face interactions and the actions initially planned. Another aspect that hindered the initial plan was due to the need to align with the implementation timing of local policies (i.e., local elections and the timing of the spatial planning processes).

Nonetheless, the drafting of the guidelines by the academic partners of the LL allowed for discussion at length as to how it would be appropriate to organise the process of integration between territorial planning and local food policies. Recalling the Living Lab's ambition, which was "To develop a local food policy and a territorial plan to counter urban expansion, guide the synergies between city and countryside and enhance the cultural heritage, the landscape and the territory", the process of policy integration between spatial planning and local food policy for the Lucca Plain may take place according to the following steps:

- (i) Starting by considering and acknowledging the willingness of civil society to pursue a strategy of relocalising food consumption, which focuses on bringing local agriculture, especially peri-urban farming, back into the spotlight to provide food and care for the open land. This approach ensures a balance of ecosystem services. The Province of Lucca has already made progress in this direction with the creation of the Intermunicipal Food Plan and by signing the Milan Urban Food Policy Pact (MUFPP), demonstrating its commitment to sustainable, locally centred food systems.
- (ii) At the level of provincial and municipal planning, based on art. 6 of law 65/2014 (mentioned above), define the Intermunicipal Food Plan as an element of the identity of the local community and a tool to ensure the vitality of the rural territory and its protection, reproduction, and transformation from a multifunctional agriculture perspective. This is yet to be achieved.
- (iii) At a strategic level, to foster the proactive protection of the rural landscape in the Plain of Lucca—recognised as a shared heritage—efforts should focus on promoting projects that strengthen the city–countryside connection, similar to successful initiatives in other regions. Drawing on Article 90 of Regional Law 65/2014, the creation of a multifunctional agricultural park should be integrated into the PTCP project framework, inspired by examples like the Parco Agricolo Sud di Milano and Parco della Piana Fiorentina. Achieving this objective is essential. This is yet to be achieved.

This latter proposal, outlined in the PTCP, must be integrated into municipal or intermunicipal planning frameworks. These frameworks can provide detailed guidance on the necessary public infrastructure interventions, such as sustainable mobility systems and areas for recreational activities linked to rural life. They can also outline strategic directions for agricultural businesses. A critical element is establishing a “control room” to guide and support investments in agriculture. An effective tool for this purpose could be the creation of a CLLD (Community-Led Local Development) initiative, as envisioned by EU policies. Within this framework, particular emphasis should be placed on developing a local land bank. Such a bank would facilitate better land resource management, preventing land abandonment, the fragmentation of ownership, and the dispersal of agricultural enterprises across the plain.

Ultimately, the path, which started with the Living Lab of the ROBUST project, has helped us understand that the strengthening of rural–urban linkages in the peri-urban territory of the Plain of Lucca could also be characterised by potential growth and sustainable development models:

- The proposal of an agricultural park in the area of the Plain of Lucca in the planning framework could guarantee the production of ecosystem services linked to rurality and, in particular, local food, tourist accommodation, etc., with a relative increase in added value for local farms but also for other sectors. At the same time, there would be positive effects on the protection of the landscape and the environment thanks to better maintenance of the territory with consequent better usability of open and green spaces and an increase in well-being and quality of life for residents and tourists.
- In this sense, the recognition within the planning tools of a local food policy—which operates in the field of food education, access to food, and circularity, among others—can produce positive effects on the demand for local food that will also have to be characterised by environmental and social sustainability precisely because it is a public food policy.
- At the same time, the recognition, within the planning tools, of the value of the land as a non-renewable resource to be protected should also push towards the definition of a new governance model for the sustainable and effective management of land resources to avoid or limit the phenomena of abandonment and, at the same time, increase the opportunities for the strengthening of existing farms and the start-up of new farms or businesses that offer services related to rurality. In addition, the recovery of abandoned/unused land would benefit the community at large, as it would have positive effects on resilience and the landscape.

6. Discussion

In light of the experience of the ROBUST project and the relevance of the theme for the area of the Plain of Lucca, beyond the results of the specific experiments conducted in the Living Lab, it is possible to develop some reflections to feed the academic debate posed by our research questions: (1) How can spatial planning and local food policies in peri-urban areas enhance the sustainability and resilience of local food systems while limiting land consumption and preserving environmental and landscape values? (2) What are the main challenges and enablers in this integration process?

While exploring how to strengthen urban–rural ties for sustainable territorial development, we observed inconsistent dynamics in the Plain of Lucca: territorial planning often undervalues peri-urban agricultural areas and their role in providing essential ecosystem services, while local public administrations, through food policies, have stressed the need to protect and revitalise struggling agricultural areas by limiting land consumption.

6.1. On Rural–Urban Links as an Integrative Concept

A first reflection is the observation that the understanding of urban–rural (dis)connections and the acquisition of an awareness of their importance remains a strongly sectoral, implicit, and sometimes vague theme, as emphasised by academic literature [50].

At the same time, we must recognise that the production/consumption of local food and the provision of ecosystem services (including cultural heritage) are very useful keys to understanding the link between rural and urban areas and identifying site-specific strategies and policies. This link must be adequately understood at the local level: as indicated by Berkhout et al. [8], “new localities”, are essential for integrating rural and urban food systems to enhance resilience by addressing localised challenges (like access to markets and the management of ecosystem services).

There is a pressing need to generate new knowledge on how rural–urban linkages manifest in different territorial contexts, with the goal of fostering awareness among citizens, policymakers, institutions, and stakeholders. Thus, stakeholders can better understand key challenges and priorities, enabling the development of targeted and effective policies. For example, what are the implications of rural and peri-urban areas specialising in specific crops, such as maize monoculture, at the expense of crop rotation? How does this practice, or the widespread use of set-aside policies, impact the quality of the rural landscape and the delivery of ecosystem services? Does it contribute to the degradation and simplification of the agricultural landscape? Similarly, how do irregular land consumption and urban sprawl affect farming activities? Do they discourage agricultural practices by increasing challenges in land access and reducing the usability of agricultural machinery, thereby prompting farmers to abandon their livelihoods? These questions—which emerged during the LL exchanges—highlight the importance of tailoring policies to address the specific interactions between urban and rural dynamics, ensuring sustainable landscapes and resilient agricultural systems.

The Living Lab meetings revealed a lack of communication between local administration planners and rural stakeholders. This disconnect often results in planning decisions that prioritise private interests over public ones, leading to urban sprawl, the fragmentation of agricultural land, and threats to farm viability, as indeed recognised by the literature [51].

Fostering stronger relationships between local institutions and rural stakeholders could streamline bureaucratic processes, boost local entrepreneurship, encourage investments, and support innovative rural activities. Additionally, improving these relationships could enhance local administrations’ awareness of the importance of protecting rural territories. This might lead to policies aimed at limiting agricultural land consumption and promoting the recovery of abandoned peri-urban land.

Modern agri-food systems often neglect the potential synergies between rural and urban areas. In regions where agriculture is fragile and cities depend heavily on global markets, policies should focus on supporting local agriculture to ensure its contributions to food production and territorial sustainability. For example, the integration of Local Food Policies, as seen in the Plain of Lucca, aims to enable community-driven planning that protects rural and peri-urban areas while fostering mutual benefits. In such fragmented agricultural contexts, promoting short food supply chains is a priority in strengthening rural–urban ties. This requires establishing supportive structures such as logistical hubs (e.g., food hubs) and information systems (e.g., labelling or guarantee mechanisms) to facilitate connections and enhance local food systems [52].

The LL also highlighted the need to strengthen the relationship between agricultural organisations, producers, and local administrations so that farm production planning and scheduling may become a shared process and not an activity of exclusive interest to the producer. Another aspect that emerges from the experience of the LL is the need for training activities, technical assistance, and the exchange of good (and bad) practices for farms operating in the territory. This is with the aim of encouraging their re-orientation towards multifunctional and environmentally friendly agricultural models considering that most farms produce commodities that end up on long and/or low value-added supply chains. This re-orientation is also necessary because we are witnessing an imbalance between the demand for local and environmentally friendly products on the part of citizens—consumers—and the supply from farms that are unable to perceive this opportunity or, while perceiving it, are unable to reinvent themselves in this sense. The need for training

and technical assistance underlines the importance of integration with another fundamental instrument of agricultural policies, such as the Rural Development Plan. For example, a PGS (Participatory Guarantee System) for local markets could provide a useful tool to promote active farmers' engagement together with consumers and local authorities. These come together to make decisions, support each other, avoid certification costs, and make sure farmers produce to a collectively agreed standard. In the case of Lucca, a PGS is currently being studied and is expected to consolidate trust, build a sense of community between farmers and their customers, improve the image of producers, and provide incentives for other farmers to increase their quality and enter local markets.

6.2. On Governance Arrangements: The Difficulties in Integrating Spatial Planning and Food Policies

The LL interactions revealed a situation of evident difficulty in proceeding with an integration between spatial planning and food policies. Territorial planning, as shown, develops on multiple institutional levels (region, province, municipality) which, in theory, should dialogue and integrate with each other but, in practice, often bring out "degrees of freedom" between the various decision-making levels. From a formal point of view, the (regional) law allows for (i) recognising, within the statutes of the territory, the importance of rural–urban linkages for the overall sustainability of the territory; (ii) proposing specific tools for the enhancement of rural and peri-urban areas such as, for example, the establishment of agricultural parks.

Moreover, responsibilities for urban planning, the environment, and infrastructure are assigned to different sectors/offices that sometimes show difficulties in developing a constructive dialogue. Agricultural policies, in the Italian context, are a regional competence even if within a framework that tends to bring control back to the state level (with National Strategic Plans for 2021–2027) with little attention to individual territorial specificities. Food policies lack a clear governance model, but municipalities can play a key role due to their decision-making autonomy. They influence the local agri-food economy through choices in school catering models (depending on catering contracts), fundraising (e.g., European projects), food assistance systems, and food education initiatives in schools. This complexity hinders dialogue between planning, agricultural policies, and food policies, but further new forms of territorial governance are also emerging (e.g., Food Districts, Biodistricts and Food Communities, etc.) which can make a great contribution to the integration process [35,53,54].

6.3. Advancing from Projects to Institutional Change: Strengthening Cross-Sectoral Connections

To transition from individual projects to systemic institutional changes, it is essential to experiment with multilevel governance models that align agricultural policies, rural development strategies, food policies, and territorial planning. The Living Lab approach offers a promising platform to kick-start this integration, although its voluntary and experimental nature limits its impact. Formal recognition by public administrations and continuous innovation in participatory methodologies are necessary to foster meaningful discussions and decision-making.

One of the key issues that emerged is the access to farmland by peri-urban farmers (or other cooperators potentially active in farming). In contexts like the Plain of Lucca, fragmented land ownership and the prevalence of non-agricultural owners (who prefer to leave land uncultivated and abandoned rather than give it to farms for management) lead to abandoned or underutilised farmland, leading to environmental and landscape consequences. Addressing this issue requires a governance model, such as a municipal or intermunicipal Regional Land Bank (Section 5.3.2), to mediate interests among landowners, farmers, and citizens effectively.

In relation to community well-being, collaborative governance involving (rural and urban) public–private stakeholders can be adopted to experiment with innovative services. Examples include partnerships linking agriculture and tourism (e.g., ecotourism) to enhance

the public value of local farms and cross-sectoral projects in education, catering, and planning to strengthen rural–urban ties through food. Establishing collaborations between diverse sectors, such as school education and food distribution or agriculture and planning, can unlock the potential of rural–urban connections. Cultural events related to rurality and food festivals are (already in place as) effective ways to mobilise civil society and strengthen the links between farmers, consumers, restaurants, citizens, and local institutions (across rural and urban spaces) [45].

Among potential growth and sustainable development models, the proposal for an agricultural park in the area of the Plain of Lucca in the planning framework could be a promising way forward to guarantee the production of ecosystem services linked to rurality and, in particular, local farms and food, tourist accommodation, etc. There would be potential positive effects for landscape and environment protection, with consequent better usability of open and green spaces and an increase in well-being and quality of life for residents and tourists.

On the other hand, the establishment of an agricultural park may face opposition and challenges from various stakeholders. Potential drawbacks include resistance from landowners (if they anticipate higher financial returns from selling or developing their land for non-agricultural purposes) and pressure from developers against zoning restrictions to urban expansion. Moreover, without stable funding mechanisms, agricultural parks may struggle to remain operational, particularly if reliant on public subsidies or irregular income streams from tourism or events. Lack of coordination and short-term political interests may overshadow the long-term goals of agricultural park initiatives, leading to inconsistent support.

To mitigate opposition, planners should engage stakeholders through participatory processes to ensure representation, providing incentives to landowners for preservation efforts (e.g., tax reductions) and establishing clear governance models that balance agricultural, ecological, and urban needs. These considerations reflect challenges documented in similar projects, such as the Parco Agricolo Sud Milano and others, where balancing stakeholder priorities and long-term sustainability has been critical [55].

These and other potential cross-sectoral connections require a major effort to move from the status of a “project activity” to an established change in practices. Often very successful initiatives or projects are set up, but they fail to enter the institutional “routine” due to difficulties, for example, linked to the rigidity of administrative processes or the time and the costs necessary to achieve structural change or to overcome inertia caused by opposing interests. However, in situations characterised by a lack of planning and new ideas and projects, Living Lab methods can be very useful to create fertile and virtuous exchange networks to carry out sustainable projects.

7. Concluding Remarks

Fostering synergies between rural and urban areas is central to the EU’s goal of smart and inclusive growth, but fragmented governance often hinders balanced development. This study explores the integration of spatial planning and food policies to enhance the sustainability and resilience of local food systems, focusing on peri-urban areas. Using an LL approach in Lucca, Italy, under the ROBUST H2020 project, this research identified challenges and opportunities for strengthening rural–urban connections, particularly through reclaiming abandoned land with the involvement of local stakeholders. While this multi-year collaborative approach revealed gaps in recognising these linkages and fostering dialogue between rural actors and urban planners, it also demonstrated the potential of formalised public–private partnerships and cross-sectoral initiatives to connect agriculture with other domains, such as education, tourism, and landscape management.

The agricultural land in the Lucca plain provides essential ecosystemic functions that contribute to the quality of life in the area, with small-scale agriculture sustaining these functions while facing several challenges (e.g., limited access to land and markets

and declining profitability). Addressing these challenges requires integrated and strategic approaches to food policy, rural development, and spatial planning.

Spatial planning and local food policies contribute to shaping land use, food production, and urban development, and their complementarity is crucial for sustainable and inclusive growth. Several recommendations emerged from the LL interactions to enhance land access and profitability. Firstly, in relation to protecting agricultural land and containing urban sprawl, spatial planning can establish urban growth boundaries and safeguard peri-urban agricultural areas, while food policies promote local food production and shorter supply chains, reducing the distance food travels from farm to table. Second, spatial planning contributes to food distribution infrastructure, supply chains, and food outlets, while food policies can leverage these networks to improve local supply chain connections between rural and urban areas. Third, spatial planning can incorporate green belts, parks, and conservation areas to enhance urban sustainability, while local food policies align with these goals by supporting urban agriculture, community gardens, and sustainable farming practices. Furthermore, spatial planning can facilitate the development of local food markets, farmers' markets, and food hubs, while food policies promote these local systems to boost local economies, provide fresh produce, and support small-scale farmers. Community participation in spatial planning processes is essential, and food policies encourage this engagement to ensure that diverse community needs and preferences are reflected in food system planning, promoting social equity and inclusiveness.

Future research directions address the potential of integrating territorial planning and food systems to promote sustainable and balanced rural–urban development. More specifically, these include assessing the costs and benefits of integrating rural and urban systems, with a focus on the role of small-scale agriculture in local economies. Further, implementing and evaluating innovative governance models to determine their capacity to reduce agricultural fragmentation and improve stakeholder collaboration is a long-term research endeavour.

We acknowledge that the LL approach applied in a specific geographical context may limit the generalisability of the findings to other regions with different socio-economic and agricultural contexts. However, we argue that there is a need for real-world experiments that explicitly address cross-sectoral integration to preserve peri-urban farmland, support local economies, and promote a sustainable and resilient food system that benefits both urban and rural communities. The experience of the Living Lab in Lucca as part of the ROBUST project, which brought together spatial planners and local food policymakers, can be seen as the beginning of a reflection that will bear fruit in the long term.

Author Contributions: Conceptualisation, F.G. and M.R.; data curation, F.G., S.A. and M.R.; formal analysis, M.R.; funding acquisition, F.G.; investigation, F.G., S.A., G.B., A.M. and M.R.; methodology, F.G., S.A. and M.R.; writing—original draft, F.G. and M.R.; writing—review and editing, S.A., G.B., A.M. and M.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was carried out in the ROBUST project funded under the Horizon 2020 Framework Programme of the European Union under Grant Agreement no. 727988. The information and views set out in this article are those of the authors and do not necessarily reflect the official opinion of the European Union. The APC was funded by the corresponding author.

Data Availability Statement: Data are contained within the article.

Acknowledgments: We would like to thank the Province of Lucca, especially Maria Pia Casini and Monica Lazzaroni, for their dedicated and productive collaboration throughout the years of the ROBUST project. We also extend our gratitude to the entire ROBUST consortium for their valuable contributions.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A. Results of Brainstorming on Rural–Urban Links Identified as Distinctive in the Plain of Lucca

Rural–Urban Links	Stakeholders Involved	Type of Interaction	Enabling Factors	Hampering Factor
Farmers' markets allow citizens and tourists to learn and build awareness about farming and local agriculture.	Farmers, producers' associations, municipalities, citizens-consumers.	The farmers' markets allow a flow of goods from the countryside into the city. They allow also for social and cultural interactions.	Farmers share knowledge and experience with customers. Popularity of farmers' markets is increased.	Prices are generally higher than in other food outlets. Lack of advertising of farmers' markets days and hours. Additional bureaucracy.
Solidarity purchasing groups reconnect producers and consumers improve understanding of the links between food ecology and human health.	Farmers, citizens-consumers, civil society.	A flow of agricultural goods from the countryside/peri-urban areas into the city. It enables a "sense of community".	Direct mutual relationship based on trust between local producers and consumers. Organic certification.	Occasional frauds lead to the disruption of entire networks. Costs of certification.
Food and wine routes are tourism initiatives to enhance the value of rural capital and its maintenance.	Farms, wineries, agri-tourisms, shops, farmers' consortia and coops, tour operators/guides, municipalities, provincial and regional authorities, tourists.	There is a significant movement of people and goods. Cultural, social, and organisational interactions take place.	Financial support.	Some initiatives revealed to be unsustainable in the long run without public financial support, especially in remote rural areas.
Regeneration of brownfield sites in peri-urban areas of Lucca and Capannori, where the industrial paper industry co-exists with agricultural activities (discussed as needed).	Industries, farmers, municipality, province, supervisory authorities.	This interaction requires actors to collaborate to address specific issues at the urban and rural interface, e.g. monitoring pollution levels.		Difficulties in defining the destination of regenerated sites. Pollution from paper industry to be monitored.
Food education initiatives in schools #1. Urban gardens and school garden projects.	Slow Food (NGO), regional authorities, agricultural high-school students, teachers, pupils, and their families.	This is a social and cultural interaction aimed at raising awareness of the complementary value of the rural and urban dimensions.	Regional projects on urban gardens provide a framework for land use and garden operations to support replication. High school students in agriculture to teach the skills for gardening in lower-level schools.	Space available out of school buildings is often limited for hosting vegetable gardens. Reliance on volunteer work. Summer months hinder garden care due to lack of volunteers.
Food education initiatives in schools #2. Vending machines supplied with healthy options, replacing snacks with fruits.	Schools, teachers, parents, pupils and students, NGOs.	Mainly a cultural interaction, raising awareness of the complementary values of the rural and urban areas.	Food waste awareness.	Young people are driven by social networks/advertising. Aesthetic irregularities of fruit and veg may limit consumption.
School meals and public procurement represent a significant market outlet for (organised) small farmers.	Schools, catering services, teachers, pupils and students, farmers, cooks, and kitchen staff.	There is a flow of goods from rural to urban areas. School meals are a means of education.	Public procurement represents a market outlet for small–medium local farmers (including local farms).	Rigid contract specifications are hard to change (i.e., now limited to special day menus).
Peri-urban farms work on formerly abandoned land and involve workers from vulnerable groups (social farming experiences).	Landlords, farmers, agricultural coops, local faith-based organisations, workers.	This type of farm works at the interface between urban and rural.	Some regulations offer possibilities to facilitate access to land (derogations to the law that states that agricultural contracts should be for at least 15 years).	Lack of access to land and fragmentation. Limited access to water in small land parcels. Co-existence between farming and residents.

Rural–Urban Links	Stakeholders Involved	Type of Interaction	Enabling Factors	Hampering Factor
Cultural events and food festivals value locally distinctive recipes and food-related rural traditions (e.g., a contest on a local traditional soup recipe made with local vegetables and beans).	NGOs and citizens.	This is mainly a cultural interaction.	Some of these events are very lively and have strong participation by locals.	Volunteers are not always available to support, risk of burden on some.
Guided tours and food-tasting experiences to wine farms, addresses locals and tourists.	Tourist guides, farms, citizens (consumers).	Cultural interaction by people from urban areas who visit the countryside.	Some farmers organise events with a high level of attendance.	Landscape degradation and abandonment lead to less attractiveness of rural areas.

Appendix B. A Vision for the Peri-Urban Area in the Plain of Lucca

“In 2050, de-carbonisation and circular economy are keywords in the EU. Same for the spreading of food systems’ models aimed at reconnecting local production and consumption. Within the European context, at local level the work of the Food Policy of the Plain of Lucca has proved effective in promoting the importance of consuming local products and boosting the activities of farms in place as well as the emergence of new farms run by young people. Thanks to such renewed interest in local food and agriculture, it is now convenient to get to cultivate the land in the peri-urban area between Lucca and Capannori (core municipalities of the Living Lab), so that land owners have either started to farm themselves or have made it available to those seeking to start a sustainable farm. This sustainability turn—in economic, environmental and social terms—epitomizes in the increase of organic and social farming and spread of new agro-ecological practices for biodiversity conservation and climate change mitigation. In addition, the model of multifunctional farms has significantly developed, with many farmers launching short supply chain initiatives—also aimed at public procurement—participatory guarantee instruments and collective brands.

Several factors have contributed to the recovery of land:

- the Rural Development Programme—provided funds for first settlement of young farmers in the areas of the Plain of Lucca and Capannori;
- a new Law on territorial planning for reducing sealing of new land to zero—reduced the expectations of landowners on the future opportunities for land development on agricultural land and open spaces;
- simplified procedures for reconverting to agriculture land which had been previously lost to abandonment;
- the Land Reclamation Consortium—requalified and maintained the network of irrigation channels in the Lucca Plain, ensuring water availability for sustainable farms;
- a new tool for matching land supply and demand, modelled on the Regional Land Bank.

A positive climate of trust due to the action of the Intermunicipal Food Policy has benefitted the activity of the Land Bank, in the first place by providing landowners with incentives for renting their land, this way overcoming their reluctance. The presence of a facilitation body and the use of ICT has allowed a more accurate knowledge of land availability, resulting in a more rational allocation of land. Soft mobility infrastructures have been created in the area of the Lucca Plain thanks to new planning tools and European funds. These make easier for residents and tourists to access the countryside for recreational activities, visiting farms and purchase local products. In addition, the impact of the recently built North-South road has been mitigated by way of ecological corridors with urban forest strips. Finally, in 2040 the so called “Six Mile Territory”—encompassing the strict relationship between the city of Lucca and the surrounding countryside, crucially important in 1950–60—has been restored with a view to sustainability and innovation”.

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