



# Integrating Land-Use and Food Planning for the Re-territorialisation of Agricultural Activities: A Review of the Literature

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Tianzhu LIU,<sup>1</sup> Romain MELOT,<sup>2,3</sup> Frédéric WALLET<sup>2,4</sup> and Coline PERRIN<sup>2,5</sup>

## Abstract

The re-territorialisation of agricultural activities (RAA) refers to the promotion of local food production and its diversification geared towards local consumption. RAA helps to shape the local food system, a subject that is increasingly studied with regard to planning. Land-use and food planning are two local policy areas associated with RAA, yet the way in which they interact to facilitate RAA remains unclear. This research aims to provide a comprehensive understanding of the integration between land-use and food planning by reviewing the scientific literature in these planning fields in the Global North over the past 24 years. We reviewed 161 publications pertaining to RAA-related interests and instruments, intersecting action fields and governance mechanisms. The literature shows the complementarity between land-use and food planning in areas related to RAA, and the consequent need to develop coherent planning strategies to improve the effective implementation of RAA. Land-use planning has a spatial dimension with regulatory instruments, whereas food planning often has a food system and life cycle dimension with strategic instruments. Access to land, collective food infrastructures, and farming practices are three areas around which land-use and food planning can have synergies. Coherence and synergy can also be favoured by a well-established co-governance model, which implies collaboration between sectors, multi-level governmental actors, and a combination of top-down and bottom-up processes. We conclude with suggestions for planning practitioners and provide a future research agenda by appealing for more empirical studies on the intersectional fields of land-use and food planning.

<sup>1</sup> Institute of Geography, University of Bern, Switzerland

<sup>2</sup> National Research Institute for Agriculture, Food and Environment (INRAE), France

<sup>3</sup> Research unit BAGAP, Rue Rabelais, 49007 Angers, France

<sup>4</sup> UMR AGIR, 24 chemin de Borde-Rouge, 31326 Castanet-Tolosan, France

<sup>5</sup> UMR Innovation; INNOVATION, University of Montpellier, CIRAD, INRAE, Institut Agro, 2 Place Pierre Viala, 34060 Montpellier, France

Corresponding author: Tianzhu Liu, [tianzhu.liu@unibe.ch](mailto:tianzhu.liu@unibe.ch)

## Biographical notes

**Tianzhu Liu** is a postdoctoral researcher at the Institute of Geography, University of Bern. Her research focuses on sustainable planning with regards to rural-urban linkages and the interplay among stakeholders.

**Romain Melot** is a researcher in sociology at INRAE based in Angers. He conducts research in legal sociology and explores matters on governance of land ownership and property rights, land policies and conflicts.

**Frédéric Wallet** is a researcher in geographical economics and institutions at INRAE in Toulouse. His work focuses on the dynamics of rural territories, focusing on organisational innovation processes and governance mechanisms.

**Coline Perrin** is a researcher and geographer at INRAE in Montpellier. Her work focuses on the interface between urban planning and agriculture, and about food system reterritorialisation with a governance perspective.

## Introduction

Planning for local food systems has been a research topic for over two decades, since the seminal studies by Pothukuchi & Kaufman (1999, 2000). Local food systems involve food produced and consumed locally, creating closer links between consumers and producers, and addressing negative consequences of the global food system regarding product quality, climate, water quality and food security (Morgan, Marsden and Murdoch, 2006; Feagan, 2007; Sonnino, 2009; Allen, 2010; Morgan and Sonnino, 2010; Enthoven and Van den Broeck, 2021; Fei et al., 2023). The Covid-19 pandemic and climate change have boosted interest in local food systems, making them a current issue (Fattibene et al., 2023; Liu, Korthals Altes, Wallet, et al., 2024). Planning and local food systems share concerns about health, economy, land use, transportation and social justice (Pothukuchi and Kaufman, 1999; Brinkley, 2013; Mui et al., 2021; Morgan, 2013).

Creating a local food system requires producers to shift from global- to local-oriented activities, termed the “re-territorialisation of agricultural activities” (RAA), which includes local food production and its diversification geared towards local consumption (e.g., farming, local processing and sale, community-supported agriculture, and agritourism) (Liu, 2024; Liu, Korthals Altes, Melot, et al., 2024). RAA involves developing new relations between products and local specificity, between rural and urban, and between stakeholders across the supply chain (Liu, 2024). *Territorialisation* involves processes that strengthen the links between activities and the territory in the spatial, material, identity-related, organisational and political dimensions (Agnew, 2013; Cox, 2013; Felici and Mazzocchi, 2022; Ying and Egermann, 2024). Although the spatial boundary of ‘local’ or ‘territorial’ food systems is not standardised (Morgan and Sonnino, 2010; Carey, 2013; Sonnino, 2016; Battersby and Watson, 2019), the prefix ‘re’ suggests a return from de-territorialised agrifood systems to the territory (Rieutort, 2009; Ying and Egermann, 2024). RAA extends beyond mere ‘local’ by encompassing *alternative food networks* based on proximity between producers and consumers, and *quality food improvement* through territorial embeddedness (Lamine, Garçon and Brunori, 2019; Liu, 2024). Although RAA does not ensure sustainability, and risks falling into the ‘local trap’ (Born and Purcell, 2006), it has the potential to improve socio-ecological sustainability and territorial development under the right conditions (Mundler and Laughrea, 2016).

Land-use and food planning are local planning policies that can significantly influence RAA. Land-use planning allocates spatial resources and building rights, among other considerations (Hengstermann and Hartmann, 2018). RAA creates needs for new buildings (e.g., for local processing or on-farm sales), which land-use planning must include while preserving farmland (Rouquier et al., 2024). Food planning emerged as a local response to the limitations of national and international productivism models (Sonnino, 2016). It is a ‘local policy framework that is adopted to address one or, typically, more food system activities with the explicit aim of steering food system outcomes in a desired direction’ (Candel, 2020, p. 922). Sonnino (2019) argues that food planning emphasises “translocalism” as a perspective integrating territoriality in a network of relations with other scales of the food system and governance such as urban regions. It uses foodshed as a strategy to holistically combine territoriality with social, economic, and environmental sustainability, and avoid the ‘local trap’ (Born and Purcell, 2006). Food planning projects vary in name – ‘urban food strategy’, ‘food charter’, and ‘food system planning’, but they are usually designed in a similar way to planning documents with a vision statement and an action plan (Sonnino, 2016).

While food planning is mainly strategic, land-use planning contains area-based rules that are legally binding. Several scholars have emphasised that food planning should be cross-sectional and coherent with land-use planning (Pothukuchi and Kaufman, 1999, 2000; APA, 2007; Raja, Born and Russell, 2008; Vitiello and Brinkley, 2014). The Milan Urban Food Policy Pact Monitoring Framework explicitly refers to land-use planning as a lever to achieve food planning goals to ‘protect the local agricultural resource base and use’ (FAO, 2019, p. 24). We posit that missing links between land-use and food planning can hinder RAA. For example, a multifunctional farming project supported by food planning can be hindered by overly strict mono-functional



land-use regulations (Crivits et al., 2016). A comprehensive understanding of how food and land-use planning can be integrated to support RAA is however missing.

This research aims therefore to further our understanding of the integration between land-use planning and food planning in a way that facilitates RAA, and thus to suggest ways to fostering synergy between them. To this end, we review scientific publications on land-use and food planning, focusing on the Global North because of shared agri-food system problems, socio-economic paths, and institutional patterns. This review considers the following questions: How does the emerging field of food planning tackle RAA? How does traditional land-use planning adapt to the new needs of RAA? What are the intersections between these two planning levers? What governance mechanisms can facilitate the coherence between land-use and food planning to improve RAA?

This paper is organised as follows. The next section outlines the methodology, followed by the presentation of results in three parts: RAA-related interests in food and land-use planning; the intersecting action fields; and governance factors affecting the integration between the two policies. We conclude with suggestions for future research.

## Materials and Methods

### Data Collection

We searched for scientific publications based on the literature review retrieval method of Hagen-Zanker and Mallett (2013). This method follows the core principles of a systematic review to broaden the data range and provide a transparent procedure while giving more flexibility to social science researchers. We searched academic databases using search strings, then screened results based on inclusion and exclusion criteria. We finally completed the literature search through snowballing and adding papers on specific topics after the initial retrieval.

First, we searched the SCOPUS database for two types of academic papers: papers on food planning and RAA, and on land-use planning and RAA. We searched for journal-style papers published in English over the past 24 years, since 2000, because in their article ‘The food system: A stranger to the planning field’, Pothukuchi and Kaufman (2000) pointed out the resurgence of awareness of food in the field of planning.

**Table 1.** Keywords of the Scopus database search strings

	Query string used in SCOPUS database, determining:	
Searching group	planning type and RAA (in title, abstract or author-keywords)	local level (in title, abstract or author-keywords)
Food planning	“food plan*” or “food strateg*” or “food poli*” or “food system plan*”	local* or municip* or communit* or territor* or urban or city or rural or region*
Land-use planning	(“agricultur*” or “farm*” or “food*”) and (“land use plan*” or “urban plan*”)	

We identified keywords for SCOPUS queries (Table 1). To define ‘RAA’, we used broad terms (“agricultur\*” OR “farm\*” OR “food\*”) to capture a wide range of activities, as RAA cannot simply be defined by a few specific terms. For instance, direct on-farm sales, agritourism, and farmers’ markets are related to RAA. We identified articles relevant to re-territorialisation at the screening stage, based on inclusion and exclusion criteria. The query (“land use plan\*” OR “urban plan\*”) defined ‘land-use planning’ because urban planning refers to land-use planning in some contexts. The query (“food plan\*” OR “food strateg\*” OR “food poli\*” OR “food system plan\*”) defined “food planning”, covering its different names. We used (local\* OR municip\* OR communit\* OR territor\* OR urban OR city OR rural OR region\*) to limit results to policy studies at

local levels. We used 18 July 2024 as the last publication date and identified papers in the ‘land-use planning’ group (n = 1319) and the ‘food planning’ group (n = 1044).

We screened the results based on the inclusion and exclusion criteria. We included papers that addressed planning projects (food planning, land-use planning, or both) and RAA-related topics in the same study. The criteria for identifying RAA referred to our definition, namely activities related to local food production and its diversification towards local consumers, including local supply chain activities (i.e., from local farming, processing, transport and logistics to local sale) and activities involving consumers (e.g., community-supported agriculture and agritourism). We focused on studies in the Global North, where most food planning projects were developed (Morgan, 2015; Candel, 2020), and where similar socio-economic contexts apply (Filippini, Mazzocchi and Corsi, 2019). We identified the Global North by referring to the advanced economies categorised by International Monetary Fund classification (2020). We excluded studies focusing on global- or national-level policies, performing from a technical perspective (e.g., archaeology, botanical issues, nutrition, water, flood, climate change, soil science, GIS and remote sensing), and those only dealing with case studies in the Global South. Each paper was initially screened by title and abstract, followed by the entire publication if necessary.

**Figure 1. Flow diagram of the literature selection process.**

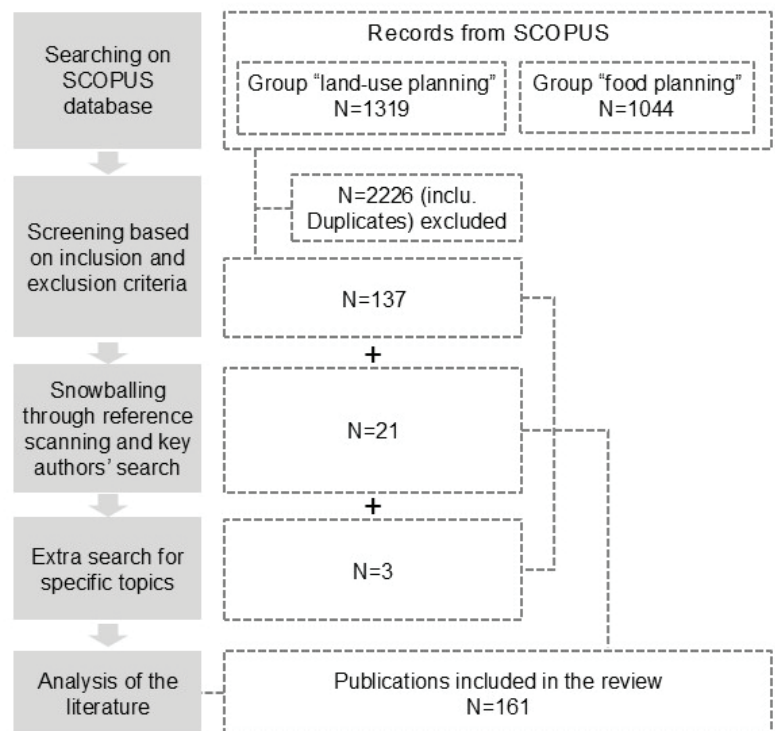
We completed the collection of papers using a snowballing technique. This involved searching for additional publications cited in the references of already identified papers and searching for work by key authors. Additionally, we conducted an extra search for articles on the specific topic of peri-urban agriculture. A total of 161 publications were reviewed (Figure 1).

### Data Analysis

The data analysis was guided by the research questions. Each paper was categorised as a ‘food planning study’, ‘land-use planning study’, or ‘both’, based on definitions provided earlier. To understand how food and land-use planning concern RAA, we identified papers based on empirical studies and recorded RAA-related interests, case study areas and planning types. For the intersections between these two types of planning policy, we first checked if land-use planning was mentioned in a food planning paper or vice-versa, and noted common topics and policy instruments. Three categories emerged: access to land, collective infrastructure, and farming practices. We then allocated papers to these categories. Regarding governance mechanisms that support coherent planning policies, we initially obtained information from papers discussing both types of planning policy, and identified major elements: cross-sector collaboration, multi-level governance, and innovative governance frameworks that involve diverse stakeholders. In the second round of the review, we included additional relevant papers that contributed to those elements and assigned them to these sub-categories. Appendix A (Supplementary material) provides details on each study.

## Results and Discussion

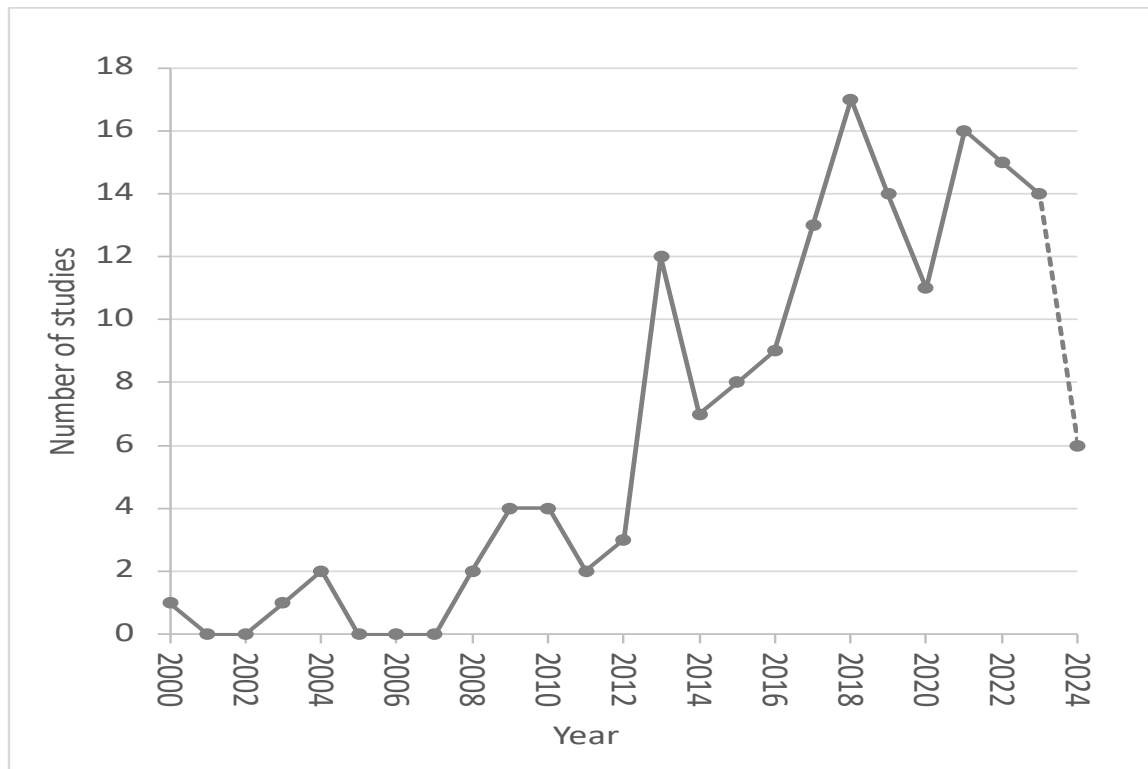
The rising trend of the reviewed 161 publications in recent years confirms the pertinence of this review (Figure





2). Table 2 presents the classification of the reviewed publications according to the planning types. It shows that only 33 publications addressed both land-use and food planning, indicating that research explicitly linking these two planning policies is just emerging. Our review was hence primarily based on ex-post comparisons of papers dedicated to a single policy.

**Figure 2. Number of reviewed publications on the topic per year**



**Table 2. Classification of the reviewed papers by studied planning types**

Studied planning types	Number of reviewed publications
Both land-use and food planning	33
Land-use planning	56
Food planning	72
Total	161

### *Shared RAA-Related Interests in Planning policies*

#### Food Planning: Regional Discrepancy on Approaches to RAA

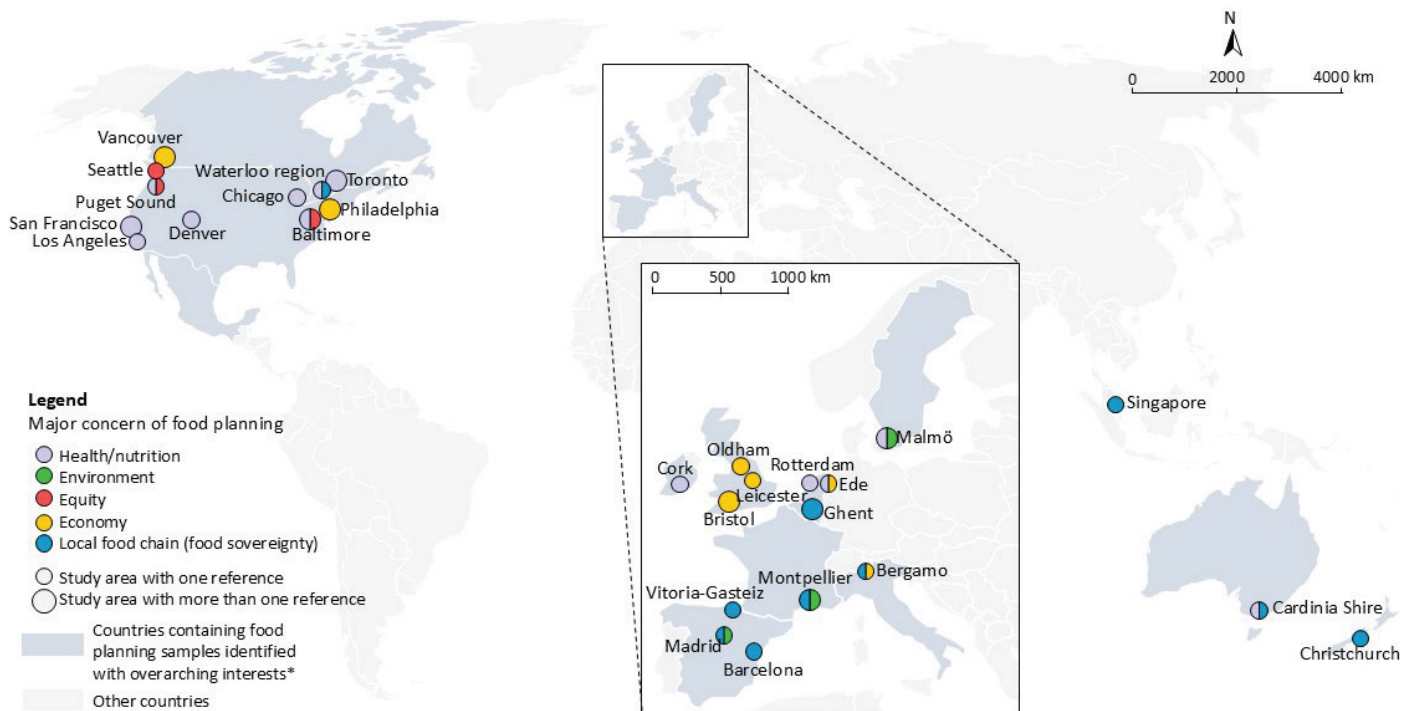
The literature shows that food planning generally aims to achieve multiple goals, such as food justice, health, environmental protection, economic development, and food sovereignty, through RAA-related activities: local food production and local food supply (Sonnino and Spayde, 2014; Ilieva, 2017; Filippini, Mazzocchi and Corsi, 2019; Candel, 2020; Liu, 2024). The empirical findings of the review illustrate regional differences in the overarching objectives of food planning (Figure 3), which affect RAA priorities (Sonnino and Spayde, 2014; Moragues-Faus and Carroll, 2018; Liu, Korthals Altes, Melot, et al., 2024).

Empirical studies show that food planning projects in North America tend to prioritise health and equity, largely attributed to the profound impact of the food justice movement (e.g., Vitiello and Brinkley, 2014; Pothukuchi, 2015; Horst, 2017; Prové, de Krom and Dessein, 2019; Candel, 2020; Cohen and Ilieva, 2021). They therefore focus primarily on urban agriculture and urban food distribution, to increase food access and



promote a healthy, equitable environment (Horst, 2017; Prové, de Krom and Dessein, 2019; Candel, 2020; Cohen and Ilieva, 2021).

**Figure 3. Distribution of the overarching objectives of food planning<sup>1</sup>**



Sources: Appendix B (Supplementary material)

In contrast, food planning in European countries tends to emphasise the environmental and economic performance of local supply chains (e.g., Crivits et al., 2016; Prové, de Krom and Dessein, 2019; Candel, 2020; Giambartolomei, Forno and Sage, 2021; Zerbian and De Luis Romero, 2021; Liu, 2024). This emphasis can partly be attributed to the climate change policy framework and the European Common Agricultural Policy, which promotes endogenous economic development (Prové, de Krom and Dessein, 2019). Food planning in Europe appears to focus more on professional agriculture, addressing issues of farmland preservation, environmental protection and regional development at a larger scale than non-professional urban agriculture (Filippini, Mazzocchi and Corsi, 2019; Prové, de Krom and Dessein, 2019). More specifically, food planning in Southern Europe tends to explicitly emphasise RAA, highlighting local food supply, agroecology, high-value products and agritourism (Candel, 2020; Giambartolomei, Forno and Sage, 2021; Zerbian and De Luis Romero, 2021; Liu, Korthals Altes, Melot, et al., 2024). This specificity might be explained by the largely embedded culture of quality food products and a less de-territorialised food system in these areas (Calori et al., 2017; Ilieva, 2017).

Similarly, food planning projects in island countries such as Singapore, Australia and New Zealand place a direct emphasis on RAA. These projects aim to improve local food supplies to cope with uncertainties from natural and economic crises, thereby reinforcing resilience (Haylock and Connelly, 2018; Diehl et al., 2020; Lourival and Rose, 2020).

#### Land-Use Planning: from Farmland Preservation to Multifunctional Agriculture

In the literature, the integration of RAA in land-use planning can be categorised into farmland preservation and urban agriculture perspectives. Land-use planning in the Global North typically has the function of preserving farmland to contain urban sprawl and secure land for food production, although the local food provision

<sup>1</sup> Some studies on food planning projects in areas such as London, New York and Milan show that food plans have comprehensive goals. It is therefore difficult to conclude on what their specific 'overarching objectives' actually are. Accordingly, we have not included these areas on this map, which aims to present distinct overarching objectives of food planning.



dimension is not always explicit and is just emerging (Vitiello and Brinkley, 2014; Daniels, 2020; Perrin et al., 2020; Jansma and Wertheim-Heck, 2021). Critics argue that this preservation tends to prioritise the quantity of farmland over the quality of farming activities (Brinkley, 2013; James and O'Neill, 2016; Perrin et al., 2020). Other than farmland preservation, much of the land-use planning literature focuses on integrating agriculture into urban settings, a reversal of the historical separation between city and agriculture. Land-use planning usually addresses the multifunctionality of urban agriculture, including tackling food insecurity, increasing self-sufficiency, creating a healthy environment, increasing social inclusion, and promoting economic development (Lovell, 2010; Thompson and Kent, 2016; Meenar, Morales and Bonarek, 2017; Dias and Marat-Mendes, 2021; Slater and Birchall, 2022; Marini, Caro and Thomsen, 2023).

Interestingly, peri-urban agriculture occupies a particular position in both urban agriculture and farmland preservation discussions. Due to its proximity to cities and the unclear boundary between urban and peri-urban areas, it is often included in urban agriculture and is recognised for its multifunctionality and diversification (e.g., Panagopoulos, Jankovska and Bostenaru Dan, 2018; Corkery, Osmond and Williams, 2021; Hanna and Wallace, 2022; Jansma and Wertheim-Heck, 2022). Compared to intra-urban agriculture, peri-urban agriculture is typically larger in scale, more professionalised, and employs more diverse distribution methods, thus having a higher potential for urban food security (Castillo et al., 2013; Opitz et al., 2016). This proximity also subjects it to significant urbanisation pressure regarding farmland preservation (Opitz et al., 2016; Duvernoy et al., 2018; Lawton and Morrison, 2022). In their land-use planning, some areas are beginning to recognise the multifunctionality of peri-urban farmland and the diversification of peri-urban agricultural activities (Camaioni et al., 2016; Scheromm et al., 2019; Jansma and Wertheim-Heck, 2022). However, farmland preservation implemented via land-use planning is argued to remain 'urban-biased' (Gulinck et al., 2018, p. 5). Local food production often gives way to other priorities such as nature conservation, energy production, landscape, recreation, territorial marketing and cultural functions (Perrin, 2013; Brinkley, 2013; Olsson et al., 2016; Tedesco et al., 2017; Gulinck et al., 2018; Perrin et al., 2020). Some preserved farmland might thus be used for recreational purposes rather than farming (Perrin, 2013; Olsson et al., 2016; James and O'Neill, 2016). Scholars argue that peri-urban and urban agriculture are insufficiently addressed in planning (Opitz et al., 2016; Scheromm et al., 2019; Corsi et al., 2023). The process of adapting land-use planning to urban agriculture is not homogeneous everywhere, and some studies even claim that it inadequately incorporates and even hinders the development of urban agriculture (Gerster-Bentaya, 2013; Halloran and Magid, 2013; Koopmans et al., 2017; Klimas and Lideika, 2018; Panagopoulos, Jankovska and Bostenaru Dan, 2018; Hanna and Wallace, 2022). Moreover, although land-use planning does address local production, it is criticised for neglecting local food supply, such as transportation and distribution facilities for locally produced food (Desjardins, Lubczynski and Xuereb, 2011; Brinkley, 2013; Edmonds and Carsjens, 2021).

To summarise the RAA-related interests in planning policies, we find that in the emerging field of food planning, diverse situations across the world reflect varying overarching goals and foci on RAA. The literature on land-use planning highlights research recognising the multifunctionality of RAA, especially in urban and peri-urban areas, representing a renewed emphasis on agriculture. Their shared interests in the multifunctionality of RAA could serve as a basis for dialogue between land-use and food planning.

### *Complementary Policy Instruments and Intersecting Action Fields*

#### Complementary Policy Instruments

Systematic studies on food planning instruments have been empirically conducted in different countries, such as Switzerland (Moschitz, 2018), Germany (Doernberg et al., 2019), the Netherlands (Sibbing, Candel and Termeer, 2021), Italy (Monticone et al., 2023), Australia (Vieira, Serrao-Neumann and Howes, 2024), Canada and the US (Schreiber et al., 2023), and France (Liu, 2024), as well as from an international comparison perspective (Filippini, Mazzocchi and Corsi, 2019; Candel, 2020; Mattioni, Milbourne and Sonnino, 2022; Liu, Korthals Altes, Melot, et al., 2024). A shared finding is that food planning mobilises a diverse range of policy

instruments, which include economic and informational, “soft” measures, rather than regulatory, “hard” ones, although measures do differ according to institutional context (legal context, authorities’ competences, and human resources).

In contrast, land-use planning mainly employs regulatory instruments based on territorial strategies, often including legally-binding measures such as zoning and building regulations to preserve farmland or legalise RAA activities (e.g., Daniels, 2000; Wegener, Hanning and Raine, 2012; Lazzarini, 2018; Perrin and Nougaredes, 2022; Daniels, 2020). Two major criticisms arise from the literature. First, binding land-use regulations alone cannot ensure farmland preservation or the development of agricultural activities (Paül and McKenzie, 2013; McFarland, 2015; Abrantes et al., 2016; Pritchard, Welch and Restrepo, 2024). Second, inflexible, over-strict and mono-functional land use regulations designed for large-scale commercial farms are likely to hinder RAA activities that have different land-use and building needs; for example, small-scale peri-urban direct-sale farms might be incompatible with minimum lot size regulations designed for farmland preservation (Nichol, 2003; Korthals Altes and Van Rij, 2013; Horst and Gwin, 2018; Perrin and Nougaredes, 2022; Corsi et al., 2023).

Therefore, land-use and food planning integration at strategic and instrumental levels is advocated. At the strategic level, integrating food planning into land-use planning can help incorporate systematic approaches and align strategic orientations and resolve conflicts, such as between farmland preservation and urban development goals (Cabannes and Marocchino, 2018; Kassis, Bertrand and Pecqueur, 2021; Jónsdóttir and Gísladóttir, 2023; Vieira, Serrao-Neumann and Howes, 2024). It may also embed food system thinking in land-use planning, focusing on the needs of agricultural activities rather than merely the quantity of preserved farmland (Campbell, 2004; Perrin, 2013; Olsson et al., 2016; Slater and Birchall, 2022). For instance, Diehl et al. (2020) show that integrated planning bolsters RAA by emphasising farming for food security, stressing productivity due to land scarcity, and establishing flexible land-use rules for new types of farms. At the policy instrument level, land-use planning serves as a regulatory lever to implement food planning goals regarding the protection of farming spaces and to remove legal barriers (McClintock, Wooten and Brown, 2012; Perrin, 2013; Huang and Drescher, 2015; Crivits et al., 2016; Filippini, Mazzocchi and Corsi, 2019; Vieira, Serrao-Neumann and Howes, 2024). Food planning is highlighted for its ability to leverage diverse instruments to implement RAA activities, thus reinforcing the farmland preservation goals of land-use planning (Paül and McKenzie, 2013; Liu, Melot and Wallet, 2024). The combination of planning instruments is argued to lead to more effective RAA implementation (Marini, Caro and Thomsen, 2023; de Waegemaeker et al., 2023; Liu, Melot and Wallet, 2024).

The literature highlights key intersecting topics between food and land-use planning: land access, collective infrastructures, and farming practices. Table 3 presents an overview of measures identified in the literature, based on either authors’ empirical findings or their recommendations. The remaining part of this section discusses each topic in detail. Several empirical studies systematically examined (potential) policy instruments in food and/or land-use planning (Raja, Born and Russell, 2008; Sonnino and Spayde, 2014; Moschitz, 2018; Doernberg et al., 2019; Filippini, Mazzocchi and Corsi, 2019; Candel, 2020; Sibbing, Candel and Termeer, 2021; Mattioni, Milbourne and Sonnino, 2022; Marini, Caro and Thomsen, 2023; Schreiber et al., 2023; Liu, 2024; Liu, Korthals Altes, Melot, et al., 2024; Vieira, Serrao-Neumann and Howes, 2024). Table 3 is used to identify more specific instruments based on thematic studies. Therefore, the sources with systematic studies usually refer





to many of the measures listed in the table and are not systematically cited within it.

**Table 3. Planning instruments for RAA**

Planning measures	Examples (sources)
<b>Access to land</b>	
Designing spatial strategies to respond to RAA needs in land-use planning	<ul style="list-style-type: none"> <li>Integrating agriculture into urban green spaces as a multifunctional part of green infrastructure in land-use planning (Andre et al., 2015; Salvador, 2019; Resler and Hagolani-Albov, 2021; de Waegemaeker et al., 2023).               <ul style="list-style-type: none"> <li>E.g., the Continuous Productive Urban Landscape working method, in urban and city-region contexts (Viljoen and Bohn, 2009; Morgan, 2015; Cardoso and Domingos, 2023).</li> </ul> </li> <li>Grouping new agricultural buildings in rural areas to avoid dispersion while supporting farming activities (Perrin et al., 2018);</li> <li>Managing urbanisation by preserving the most suitable farmland for traditional agriculture through a detailed assessment of high-quality agriculture (Camaioni et al., 2016).</li> </ul>
Preserving farmland through land-use zoning and associated instruments	<ul style="list-style-type: none"> <li>Setting agricultural zones with regulations governing constructions (e.g., Perrin et al., 2020);</li> <li>Establishing clear urban-rural limits such as urban growth boundaries and greenbelt buffers (Daniels, 2000; Wegener, Hanning and Raine, 2012; Lazzarini, 2018; Daniels, 2020; Perrin and Nougaredes, 2022);</li> <li>Conservation easements (Daniels, 2020).</li> </ul>
Removing legal barriers and applying regulations to urban agriculture	<ul style="list-style-type: none"> <li>Creating new zoning categories for urban agriculture (Shey and Belis, 2013; Meenar, Morales and Bonarek, 2017);</li> <li>Establishing new urban agriculture districts or park with incentives (Thibert, 2012; Magoni and Colucci, 2017; Diehl et al., 2020);</li> <li>Down-zoning vacant urban land for urban agriculture (Thompson and Kent, 2016; Coppola, 2019);</li> <li>Authorising agriculture in selected urban zones by amending zoning regulations (McClintock, Wooten and Brown, 2012; Paddeu, 2017; Corkery, Osmond and Williams, 2021);</li> <li>Setting regulations and guidelines for urban agriculture, such as withdrawal distances, garden plot sizes, community garden building heights, backyard animal requirements (McClintock, Pallana and Wooten, 2014; Meenar, Morales and Bonarek, 2017; Coppola, 2019; Halvey et al., 2020; Dias and Marat-Mendes, 2021; Slater and Birchall, 2022).</li> </ul>
Applying incentives or imposing rules for developing urban agriculture	<ul style="list-style-type: none"> <li>Encouraging urban agriculture in the private sector by, for example, supporting roof farms through exemptions from gross floor area ratios (Diehl et al., 2020);</li> <li>Creating rules that require residents to dedicate a certain percentage of their gardens to food production (Van der Gaast, Van Leeuwen and Wertheim-Heck, 2020; Jansma and Wertheim-Heck, 2022);</li> <li>Incorporating food production spaces in new developments and social housing projects, and permitting rooftop gardens on public buildings (Huang and Drescher, 2015).</li> </ul>

Allocation of publicly owned land for targeted types of agricultural activities	<ul style="list-style-type: none"> <li>• To young farmers and alternative activities (Perrin et al., 2018);</li> <li>• To small farms practising agroecology (Perrin and Baysse-Lainé, 2020; Resler and Hagolani-Albov, 2021);</li> <li>• To disadvantaged producers such as social housing for young farmers (Poli, 2017) and immigrant communities (Olsson, 2018);</li> <li>• To government-run farms and gardens (Cretella and Buenger, 2016; Horst, 2017; Halvey et al., 2020; Jahrl, Moschitz and Cavin, 2021);</li> <li>• To farm incubators, social integration farms and agro-parks (Liu, 2024);</li> <li>• To local farming in general (e.g., Mansfield and Mendes, 2013; Cretella and Buenger, 2016; Horst, 2017; Perrin and Baysse-Lainé, 2020; Resler and Hagolani-Albov, 2021; Vara-Sánchez et al., 2021).</li> </ul>
Collective models of ownership to provide tenure for farmers	<ul style="list-style-type: none"> <li>• Establishing farmland trusts to allocate collective land to local farms (Andre et al., 2015; Léger-Bosch et al., 2020; Cohen and Ilieva, 2021);</li> <li>• Using land banks to acquire and redistribute vacant or derelict land for agricultural use (LaCroix, 2010; Crivits et al., 2016; Horst, McClintock and Hoey, 2017; Prové, de Krom and Dessein, 2019);</li> <li>• Negotiating property rights to preserve farmland, such as through the trade or purchase of development rights (Daniels, 2000; Perrin et al., 2020).</li> </ul>
Modifying lease rules to improve tenancy security	<ul style="list-style-type: none"> <li>• Fabricating long-term, renewable and/or flexible leases (Huang and Drescher, 2015; Meenar, Morales and Bonarek, 2017; Diehl et al., 2020);</li> </ul>
Economic incentives to encourage local farming	<ul style="list-style-type: none"> <li>• Providing direct investments, awards, grants and direct/indirect subsidies for farming activities (Cretella and Buenger, 2016; Horst, 2017; Morley and Morgan, 2021).</li> </ul>
Informational support to encourage local farming	<ul style="list-style-type: none"> <li>• Providing farmers with information and technical advice on land access and farm operations (Moragues-Faus and Morgan, 2015; Cretella and Buenger, 2016);</li> <li>• Making inventories of potential land for farming (Mansfield and Mendes, 2013; Huang and Drescher, 2015).</li> </ul>
Collective food infrastructures	
Spatially organising food infrastructure networks in land-use planning	<ul style="list-style-type: none"> <li>• Integrating diverse local food infrastructures in spatial planning, such as food hubs, public storage, transportation facilities and mobile food distribution (Sonnino, 2016; Tedesco et al., 2017; Siegner, Sowerwine and Acey, 2018);</li> <li>• Addressing accessibility and compatibility with neighbouring land uses (Nichol, 2003; Gerster-Bentaya, 2013; Salvador, 2019; Marat-Mendes et al., 2021);</li> <li>• Incorporating food infrastructures into local regeneration schemes when creating new public spaces (Nichol, 2003; Hamilton, 2011; Salvador, 2019). <ul style="list-style-type: none"> <li>• E.g., designing food hubs as a complex for food aggregation, processing, distribution, tourism and community activities (Luoni, 2021).</li> </ul> </li> </ul>
Removing legal barriers and setting regulations for local food infrastructures	<ul style="list-style-type: none"> <li>• Authorising farmers' markets in zoning plans and regulations (Hamilton, 2011; Thompson and Kent, 2016; Vara-Sánchez et al., 2021);</li> <li>• Designing regulations tailored to the food infrastructure characteristics <ul style="list-style-type: none"> <li>• E.g., managing nuisances to inhabitants when permitting urban livestock slaughter (McClintock, Pallana and Wooten, 2014).</li> </ul> </li> </ul>

Local authorities help establishing different forms of physical infrastructure	<ul style="list-style-type: none"> <li>Allocating dedicated spaces for farmers' markets, local processing industries, wholesale markets and food hubs that connect local producers (Blay-Palmer, 2009; Morgan and Sonnino, 2010; Mansfield and Mendes, 2013; Vara-Sánchez et al., 2021).</li> <li>E.g., addressing administrative barriers to develop an agroecological food hub within a wholesale market, considering the economic viability of the project, including agreements to lease the space and refurbishment works (Vara-Sánchez et al., 2021).</li> </ul>
Promoting public procurement of local food	Mobilising government and school canteens to purchase from local farmers with criteria, such as requiring a certain percentage of organic food (Morgan and Sonnino, 2010; Michel and Soulard, 2019; Cohen and Ilieva, 2021; Vara-Sánchez et al., 2021).
Farming practices	
Integrating RAA principles in spatial land-use plans	<ul style="list-style-type: none"> <li>Restructuring land-use plans to incorporate principles of product diversification (Menconi, Giordano and Grohmann, 2022; Cardoso and Domingos, 2023);</li> <li>Local authorities help establishing different forms of physical infrastructure</li> </ul>
Designing tailored regulations according to desired farming practices	<ul style="list-style-type: none"> <li>Designing land-use regulations based on land-suitability investigations (Mason and Knowd, 2010; Haberman et al., 2014).</li> <li>E.g., Tailoring regulations for different types of urban livestock based on their characteristics regarding farm size requirements, conflicts with habitats and consumption destinations (McClintock, Pallana and Wooten, 2014).</li> <li>E.g., Adapting regulations of diverse and hybrid activities in peri-urban areas based on their land-use requirements, their landscape impacts and owners' financial capacities, such as distinguishing between small-scale obsolete greenhouses and new high-tech greenhouses (Korthals Altes and Van Rij, 2013).</li> </ul>
Economic incentives to sustainable farming practices	<ul style="list-style-type: none"> <li>Leveraging agro-environmental compensations and providing financial support for ecological transition farmers (Liu, 2024);</li> <li>Applying environmental lease for publicly- or collectively-owned land (Léger-Bosch et al., 2020; Liu, 2024).</li> </ul>
Informational and organisational activities to promote sustainable farming practices	Providing information, communication and advice to facilitate farmers' ecological transition, including conducting analysis and providing strategies to help diversify local products (Liu, 2024).
Land allocation to desired farming practices	Allocating land specifically for agroecology farming (Perrin and Baysse-Lainé, 2020; Resler and Hagolani-Albov, 2021).

### Access to Land

Access to land is the most recurring topic in both the land-use and the food planning literature. The specific needs of RAA broaden the usual concern of producers' access to land, which leads to the need for combined planning instruments. The instruments identified in the literature range from integrating farming into the spatial organisation of green structures, zoning regulations and associated instruments, allocation of publicly owned land and diverse forms of ownership, to providing informational support for farmers (Table 3). Discussions are heavily focused on peri-urban and urban areas, where proximity to cities offers favourable conditions

for RAA but also imposes constraints (Blay-Palmer, 2009; James and O'Neill, 2016; Sanz Sanz, Martinetti and Napoléone, 2018; Zasada et al., 2019). It should be noted that although many measures are proposed and applied in specific contexts, they are not necessarily widespread. For example, through empirical research, Vandermaelen et al. (2023) found that although using public land for food production is included in policies, it is mostly symbolic and occurs within the systematic sale of public farmland, rather than being part of a broader farming strategy.

### Collective Food Infrastructures

Collective food infrastructure, such as farmers' markets, food hubs and mobile food distribution facilities, is a consistent topic in the food planning literature and an emerging one in the land-use planning literature. Sonnino and colleagues (2016; 2019) identified two types of infrastructure critical for connecting local food production and consumption: physical (e.g., farmers' markets, processing centres, wholesale markets) and invisible (i.e., public procurement leveraging purchasing power to connect producers and consumers). Instruments addressing these issues include measures for spatial organisation, removing legal barriers and supporting projects through dedicated land and investment (Table 3). The literature also highlights the fact that policy instruments evolve over time. Once identified as the 'missing middle' that needs greater attention in planning (Donald, 2008; Brinkley, 2013; Moragues-Faus and Marsden, 2017; Sonnino, Tegoni and De Cunto, 2019; Candel, 2020; Clark, Conley and Raja, 2020; Sibbing, Candel and Termeer, 2021), recent studies indicate progress in countries such as Spain (Vara-Sánchez et al., 2021) and France (Liu, 2024).

Interestingly, studies on removing land-use regulatory barriers for food infrastructure, especially farmers' markets, focus primarily on North America (Raja, Born and Russell, 2008; Desjardins, Lubczynski and Xuereb, 2011; Edmonds and Carsjens, 2021). For example, a study on incorporating food markets into municipal laws in Michigan, USA, shows that few cities explicitly allowed farmers' markets in zoning ordinances; the insufficient adaptation of food policy recommendations to land-use planning resulted in the illegal status of the markets (Edmonds and Carsjens, 2021). This reflects differences in research focus across areas, and it may result from varying institutional contexts. In many parts of Europe, farmers' markets remain active and are less constrained by planning regulations, which might explain the lower volume of research from this perspective.

### Farming Practices

The transition of farming practices is highlighted in the literature as essential for achieving the embedded goals of food planning in improving local food self-sufficiency and environmental performance (Lulovicova and Bouissou, 2023). This transition includes shifting from conventional to agro-ecological farming (Michel and Soulard, 2019; Zerbian and De Luis Romero, 2021; Marull et al., 2023; López-García and Carrascosa-García, 2024) and developing alternative urban farming practices (Lovell, 2010; Mason and Knowd, 2010; Haberman et al., 2014). Diversifying local products is likewise crucial, as regional food self-sufficiency also depends on providing sufficiently diverse products rather than relying on industrialised systems, which are characterised by the oversupply of livestock and a shortage of market gardening in the studied areas (Wascher and Jeurissen, 2017; Tedesco et al., 2017; Zasada et al., 2019; Lulovicova and Bouissou, 2024). The transition therefore requires restructuring land-use plans to support diversified farming types (Menconi, Giordano and Grohmann, 2022; Cardoso and Domingos, 2023).

There is limited literature specifically addressing measures and instruments for farming practices. Identified measures include the spatial restructuring of land-use, investment in desired farming projects, adaptation of land-use regulations, and provision of informational support (Table 3). A few studies show that land-use planning may constrain farming practices. For example, in France, market gardening was constrained by regulations on farm buildings (Perrin and Nougaredes, 2022). In Detroit, USA, the absence of land-use regulations on farm sizes has tended to favour large farms over small-scale producers (Pothukuchi, 2015; Paddeu, 2017). Liu (2024) argues that the lack of attention to the ecological transition of farming practices results from power dynamics between conventional and pro-transition actors, which leads to the marginalised voice of ecological



transition in planning processes.

Overall, the three intersecting action fields identified suggest important policy implications for the design of policy instruments. First, policymakers should consider diversified food supply chain activities beyond food production. Integrating food planning could enable land-use planning to include the specific needs of RAA and create an enabling regulatory environment for it. Second, innovative land-use strategies should address the particular issues associated with RAA, such as balancing building rights and minimising land take. Local authorities could also provide spaces for collectively managed RAA as experiments. Third, a combination of policy instruments supporting RAA is needed, such as combining land-use regulations and market-led land-use instruments. The ability of food planning to mobilise diverse 'soft' and non-regulatory policy instruments has especially great potential in flexible policy design.

### *Governance Models Facilitating Planning Integration*

#### Cross-Departmental Governance

Land-use and food planning projects are usually managed separately (despite a few cases, such as Bedore, 2014): land-use by traditional planning departments, and food planning by individual food policy offices or departments of health, environment, economic development or social development (see, for example, Sonnino, Tegoni and De Cunto, 2019; Mattioni, Milbourne and Sonnino, 2022). Yet food planning is inherently cross-sectoral. RAA, as a boundary object involving all the food system components, requires initiatives led by 'boundary spanners', who remove silos by linking internal and external networks (Clark and Jablonski, 2022). Therefore, planning policy integration requires collaboration between departments (Mansfield and Mendes, 2013; Morgan, 2013; Moragues-Faus and Morgan, 2015; Sonnino, Tegoni and De Cunto, 2019; Monticone et al., 2023).

We identified key forms of collaboration between the two planning-related departments from the literature. The communication of resources based on staff involvement in policymaking processes builds up bases for collaboration. It enables knowledge transfer, technical information sharing and consistent policy design (Wegener, Hanning and Raine, 2012; Michel and Souldard, 2019; Liu, Korthals Altes, Melot, et al., 2024). Institutional reform also fosters collaboration and reinforces RAA implementation. For instance, in Singapore, a coordinated process involving different agencies and authorities increased the approval of commercial farms on non-agriculture land (Diehl et al., 2020).

#### Cross-scalar and Trans-local Governance: RAA at a City-Region Scale

The food planning literature consistently emphasises planning RAA at the city-region scale, because this perspective addresses surrounding rural areas as 'foodsheds' to feed cities, links urban food insecurity with rural distress, drives regional development, and can improve living environments through rural-urban linkage (Sonnino, 2009; Carey, 2013; Morgan, 2015; Moragues-Faus and Marsden, 2017; Blay-Palmer et al., 2018; Cabannes and Marocchino, 2018; Valley and Wittman, 2019). The City Region Food System approach, developed and applied in multiple areas, is valued for its holistic approach that links rural and urban, and embeds sustainable goals. This approach addresses cross-scalar issues and is praised for its ability to unify stakeholders across jurisdictions, policies and scales (Blay-Palmer et al., 2018, 2022). Different cities within a city-region system also play varied roles (Van der Gaast, Van Leeuwen and Wertheim-Heck, 2020).

The scale of planning matters as it influences the participation of stakeholders, funding, resources and power (McPhearson, Hamstead and Kremer, 2014; Prové, de Krom and Dessein, 2019; Jablonski et al., 2019; Karetny et al., 2022). For example, when the governance scale is limited to urban municipalities, planners have difficulty addressing farmland issues beyond municipal boundaries (Hayhurst et al., 2013). Case studies on Greater London over time highlight how cross-scalar governance corrected mismatches in intervention scales



(Reynolds, 2009; Morgan and Sonnino, 2010; Parsons, Lang and Barling, 2021). London food planning managed at the metropolitan scale encountered implementation barriers because of the lack of implementation competency at the inferior local unit level (Morgan and Sonnino, 2010). As a solution, coordinated borough-level food policies facilitated effective implementation (Parsons, Lang and Barling, 2021).

Cross-scalar governance is particularly essential in the context where local authorities lack legitimacy or human resources in agri-food issues (González De Molina and Lopez-Garcia, 2021; Arcuri, Minotti and Galli, 2022). It has however been found to be insufficient in planning practices, although specific and emergent issues such as Covid-19 accelerated the process and triggered greater attention at government level (Fattibene et al., 2023; Sonnino, 2023). After reviewing around 400 publications in the US and Europe, Clark et al. (2015) found that local publications mainly focus on food planning, whereas state publications emphasise land-use policies, indicating a lack of a holistic approach to integrating food and land-use policies in research on the local scale of governance.

The 'city-region' spatial boundary presents a planning challenge and has sparked discussions about the appropriate scale for planning. Researchers have examined self-sufficiency levels of local food systems using geographical food provision scales (Wascher and Jeurissen, 2017; Zasada et al., 2019). However, territoriality extends beyond mere geographical space to social coherence and regional identity, jurisdictional boundaries, resource flows and data availability (Sonnino, 2016; Borrelli and Marsden, 2018; Cavallo and Olivieri, 2022). Some argue that there are no fixed boundaries, and different rationales for delimitations, such as administrative units, territorial areas and production areas, may be appropriate for different localities (Sanz Sanz, Martinetti and Napoléone, 2018; Blay-Palmer et al., 2018).

#### An Innovative Framework Combining Bottom-Up and Top-Down Approaches

The literature on both planning policies highlights that bottom-up initiatives and top-down planning can be complementary to achieve efficiency. The literature on land-use planning emphasises the importance of participatory planning (James, 2014; Skog, 2018). In contrast, studies on food planning move beyond the participatory planning discourse and address innovative governance mechanisms emerging in this new policy domain. Bottom-up and top-down approaches are mutually dependent; while civil society needs local government support (e.g., granting access to public space, subsidies), local governments need external resources and skills to effectively implement food planning actions (Moragues-Faus and Morgan, 2015; Sadler, Arku and Gilliland, 2015; Duvernoy, 2018; Sibbing et al., 2022).

Two notable features of governance in the new policy field of food planning are highlighted in the literature. The first revolves around Food Policy Councils (FPCs) as a new governance model for food planning. FPCs, with either a bottom-up or a top-down approach, create a space for different actors from both public and private sectors to engage and exchange ideas (e.g., Campbell, 2004; Bassarab, Santo and Palmer, 2022). FPCs can contribute to planning policy integration by persuading planning officials to modify land-use planning based on food planning, mobilising diverse actors to deliver professional knowledge to policymakers, and influencing political awareness by linking land-use and food issues via the mobilisation of citizens (Wekerle, 2004; Blay-Palmer, 2009; Hamilton, 2011; McClintock, Wooten and Brown, 2012; Shey and Belis, 2013; Camaioni et al., 2016; Sloane et al., 2019; Vara-Sánchez et al., 2021; Bassarab, Santo and Palmer, 2022). Leitheiser and colleagues (2022) comment that FPCs are a way of 'commoning' in food governance, which requires policymakers to refresh their understanding of democracy.

The second feature of governance revolves around the fact that food planning is developed in unusual policy frames that are sometimes contingent, unstable and contentious, therefore necessitating certain flexibility (Moragues-Faus and Sonnino, 2019; Blay-Palmer et al., 2022). Local stakeholders do not always agree on consensual visions or priorities; therefore, 'assemblage' has been applied to food planning network as it provides a 'non-prescriptive framework that helped to identify diverse, fluid and overlapping agencies [...]



having rather undefined decision-making mechanisms [...]’ (Moragues-Faus and Sonnino, 2019, p. 14). Moreover, the vision of what should be the diversity of stakeholders is not consensual across territories, and is linked to divergent local ambitions of local initiatives – as mere debate arenas or as platforms leading to transformative actions (Santo and Moragues-Faus, 2019). Santo and Moragues-Faus (2019) address two sticking points: bringing together organisational representatives or grassroots communities, and involving stakeholders of both alternative and conventional agriculture in local groups. A recent study investigating the integration of land-use and food policies shows that procedural integration helps to incorporate multi-stakeholders of food planning into traditional land-use planning, thereby generating new dynamics and reshaping power relations (Liu, Melot and Wallet, 2024).

The identified models suggest policy implications regarding governance mechanisms. First, integrated planning requires cross-departmental collaboration throughout the planning process, from sharing technical resources and aligning regulations, to facilitating RAA-related permits. Second, we suggest adopting the city-region food system concept in planning and involving multi-level and trans-local stakeholders within the city-region to ensure coherence between stakeholders, and planning areas and break silos. Third, new governance strategies to integrate land-use and food planning should be further explored, potentially through FPCs. Fourth, it has been suggested that regional authorities and research institutes train local managers and planners in cross-sectoral, multi-level approaches to integrating land-use and food-related issues.

### **Conclusion: Integration of Food Planning with Land-Use Planning Needs – a Paradigm Shift**

This review has applied a systematic review retrieval method adapted to social science, to further the understanding of how the integration between land-use and food planning could facilitate RAA. The findings highlight their complementary and synergetic potential in enhancing RAA, particularly in access to land, collective food infrastructures and farming practices. Achieving this requires integrated planning governance mechanisms that are cross-sectoral, cross-scalar, and innovative in engaging multi-stakeholders – a framework that needs further development. This research is innovative in linking land-use and food planning, offering new insights into integrated planning and adding value to policy integration theories.

In our opinion, the integration of food planning with land-use planning calls for a paradigm shift. For land-use planning, this implies putting RAA on the agenda with other sustainable development issues and systematically paying attention to the various stages of local food supply chains, taking into account the diversity of stakeholders’ profiles and practices. It also involves translating food planning into effective implementation by addressing land-use and property rights issues. To this end, policymakers need innovation in the design of policy instruments and governance mechanisms.

This review highlights the fact that research specifically on planning for RAA remains limited. More empirical analyses on diverse RAA-associated activities could provide a better understanding of their particular needs and corresponding planning strategies. There is also a need to broaden the scope of the topics associated with RAA; for example, the issues of biodiversity and adaptation to climate change are largely absent from the existing literature, and the question of social equity has yet to be attended to. This review reveals varied RAA planning approaches across territories, and shows that institutional contexts matter. International comparisons could enrich the understanding of contextual differences and their impacts on planning. Whereas this review is limited to English-language contributions and to the Global North, food planning is also developing in the Global South and is spreading across the world. Future research could include non-English-language publications and focus, especially on the Global South to identify local policy innovations in different contexts. Future research could also explore the relevant scale for RAA planning, while emphasising local particularities due to institutional diversity. While most reviewed literature has an urban or peri-urban focus, future research could focus on rural settings. This review provides an overall understanding of the intersections between

planning policies but should be validated by empirical studies and by assessing the implementation of these policies. Avenues for future research could include empirical studies on the following: integration of land-use and food planning; evaluation of the impacts of significant issues such as Covid-19 and aggravated climate change; assessments of their effects on RAA; and comparisons between different contexts.

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## **Supplementary Materials**

### **Appendix A: Summary of 154 reviewed studies**

### **Appendix B: Major focus on food planning and on RAA**

These two appendices can be downloaded in an Excel file from:

<https://ijsaf.org/index.php/ijsaf/article/download/608/446>