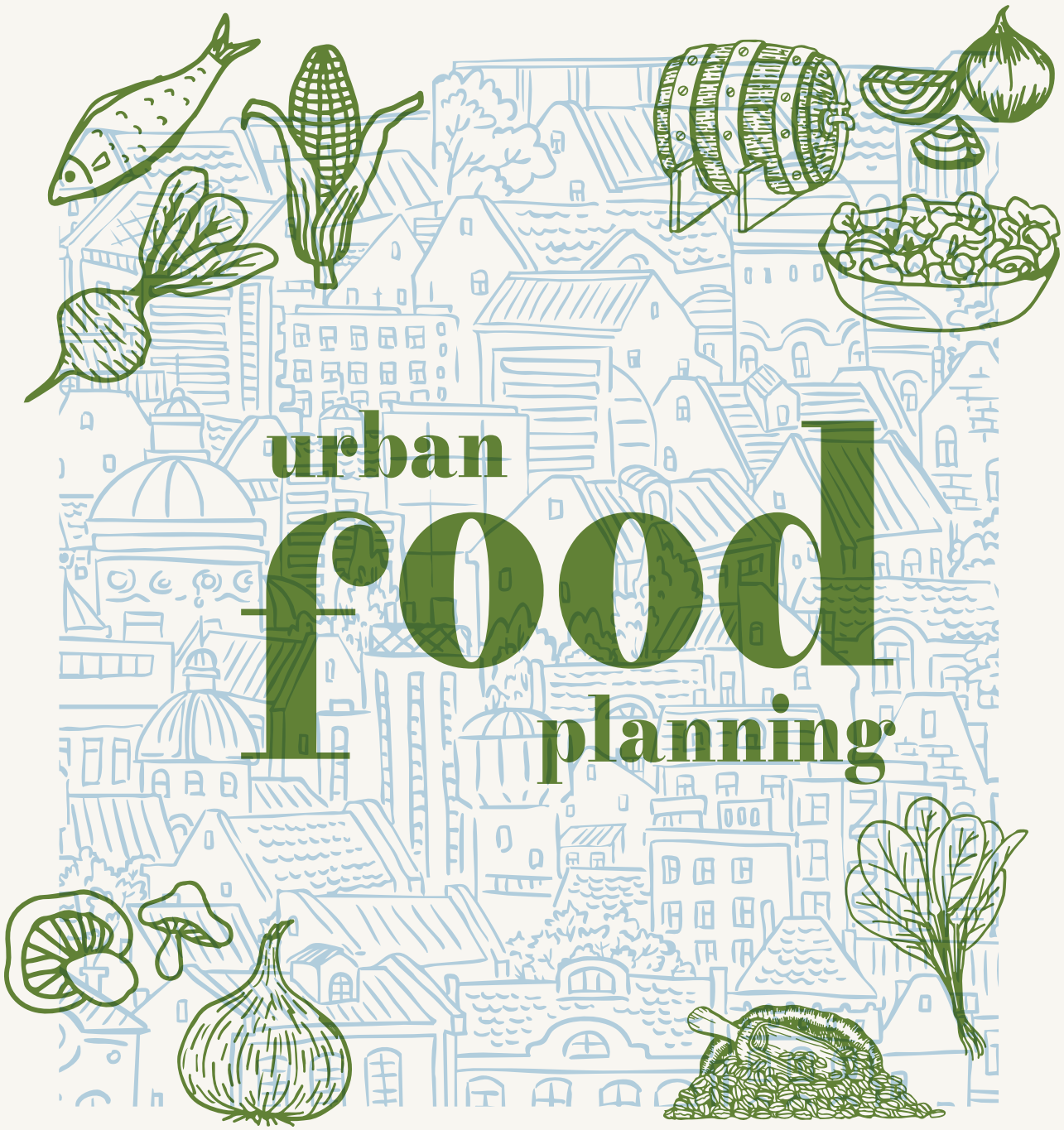
ISSN 1300-7319
2025 | Supp(1)
Special Issue

PLANLAMA

TMMOB ŞEHİR PLANCILARI ODASI YAYINI



urban food planning

TMMOB
Şehir Plancıları Odası

ISSN 1300-7319

The Journal of Planning, the official publication of the UCTEA Chamber of City Planners of Turkey, was launched in 1986.

Published three times a year (March, July, November).

Journal of Planning is listed as "national peer-reviewed journal" in ULAKBIM Social Science Database by TUBITAK and indexed in Ulrich's and Avery (Index) since 2013; in Web of Science, Emerging Sources Citation Index (ESCI) Database since 2015; in TUBITAK ULAKBIM TR Index Social Science Database since 2017; in European Reference Index For The Humanities And Social Sciences (ERIHPLUS) since 2019; in EBSCO since the end of 2020, in Idealonline, GALE and Asian Science Citation Index(ASCI) indexed starting to 2024.

Owner and Chief Editor: Akif Burak ATLAR, on behalf of UCTEA Chamber of City Planners of Turkey

UCTEA Chamber of City Planners Istanbul Branch

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Internet address: www.planlamadergisi.org

KARE MEDIA www.karepb.com

Designed by KARE MEDIA.

Publication date: September, 2025
Publication type: Periodical

Cover design: Furkan Türk

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ture review, providing a critical evaluation highlighting their strengths and weaknesses, addressing controversial or missing points in the literature, and identifying areas requiring further research. The titles and abstracts of these articles should be written in the format of research articles; the subsequent sections should consist of introduction, text, and references and should not exceed 5000 words.

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6. Ethics Committee Approval Document (if required)
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All sections of the article should be prepared in 11-point "Arial" font size and double-spaced; leaving a margin of 2.5 cm (1 inch) on all sides of the page. The main text along with tables and figures should be uploaded as separate files into the system. The main text should be in Word format, and line numbers should not be included within the text. Article pages should be sequentially numbered throughout the article.

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Content

Editorial

It is with great pleasure that we introduce this special issue on **Urban Food Planning**. Conceived as a contribution to the literature on urban food systems and as a platform for disseminating the outcomes of the **FUSILLI project**, this issue has successfully brought together scholars, researchers, and practitioners from diverse regions across the globe, spanning Europe and the Global South. The editorial process, initiated in September 2024, has now reached its conclusion. We extend our sincere appreciation to all the authors, referees, and colleagues at the *Journal of Planning*, as well as to the editorial team, for their indispensable contributions.

Before providing insights from the issue, we would like to commemorate **Prof. Dr. Yves Cabannes**, who enriched this issue with his valuable reflections on the call and by generously serving as a referee. His passing on 12 January 2025, at the age of 72, represents a profound loss to the international planning community. **We dedicate this special issue to his memory, his priceless ideas, and his lifelong contributions and guidance** in the fields of urban planning, urban local food systems, urban food planning, participatory budgeting, habitat-related human rights, and more. He was both an engaged activist who stood alongside many resistances and a dedicated researcher who worked in more than 60 countries across Europe, Sub-Saharan, North Africa, Asia, the Middle East, and Latin America. At the end of this editorial introduction, we included obituaries written by his colleagues Prof. Dr. Julio D. Dávila and by Prof. Dr. Robert Biel, both from University College London (UCL).

Food, long considered a stranger to the field of planning, has become one of the most critical and complex challenges that cities face today. Urbanization in most parts of the world has left cities largely dependent on external sources—surrounding regions or less developed countries—for their food supply. Yet, our food systems are proving unsustainable in the face of crises related to climate change, food justice, land grabbing, biodiversity loss, food sovereignty, public health, animal welfare, and resource depletion. The urgency of a new paradigm in city and regional planning, as well as among policymakers, cannot be overstated.

International frameworks, including the UN's New Urban Agenda, the SDGs, the EU Green Deal, and the Milan Urban Food Policy Pact, highlight the role of cities in transitions of the urban food systems. Although food was long neglected in urban planning, since the 2000s there has been growing academic and policy attention to "sustainable food planning," supported by academia, local authorities, and grassroots initiatives.

Building on this general framework, this special issue addresses discussions at the interface of food, cities, and planning through thirteen contributions: six research articles, two reviews, and five opinion papers.

The first research article examines the relations between multi-scalar actors—from international organizations to vulnerable groups—together with local and rural development policies, emerging local food systems, and governance mechanisms across southeastern and southern Anatolia. The second article investigates urban policies with reference to the water-energy-food (WEF) nexus, applying both qualitative and quantitative techniques in three major metropolitan cities in Turkey.

Focusing on a more local scale, the third article explores spatial multicriteria decision making for urban agriculture in Beylikdüzü (Istanbul). In turn, the fourth article reconsiders the potential of SWOT analysis in designing a local government-centred urban food system in Mamak (Ankara).

Moving beyond the Turkish context, the fifth article addresses the Global North-centric perspective of the urban food strategies literature by examining the case of Gualeguaychú, Argentina, which is developing an urban food policy independent of international agreements. Finally, the sixth article investigates governance mechanisms of urban and peri-urban agriculture (UPA), questioning their contribution to sustainability, innovative capacity and problem-solving potential, based on evidence from 15 European cases.

This special issue is supported by the FUSILLI project, funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000717.

Editorial

Together with these research articles, the issue also features review contributions. The first review article conducts a systematic literature review on spatial planning in the transition of food systems. Following this, the second review examines environmentally sustainable agriculture in Hungary, with a focus on permaculture as an innovative practice.

Complementing both research and reviews, the issue further includes opinion papers. The first opinion paper emphasizes the connections between agri-food and cities from a sustainable perspective through UPA, SDGs and the role of urban planning and governance in sustainability transitions. The second presents insights from the EU Horizon-funded FUSILLI project, which involves 12 European cities, positioning cities as key agents in sustainable urban food system transitions through comprehensive methodologies and city actors to help cities design and implement effective food policies.

The third paper assesses the role of multilevel governance in food system resilience and the need for integrative policies, drawing on the Thematic Partnership on Food, developed under the Urban Agenda for 40 the EU. The fourth contribution reflects the need for a paradigm shift on urban planning in Turkey moving from closed to open planning approaches. Finally, the fifth piece reimagines urban gardens as disaster parks, as the spaces that could guarantee food resilience in times of emergency and crises.

We hope that the studies in this special issue will contribute to the growing literature of urban food planning, inspire new intellectual horizons, and stimulate further research in this field. Once again, we sincerely thank all contributing authors and referees, whose careful evaluations greatly enhanced this issue. We wish you an insightful and enjoyable read.

Emel KARAKAYA AYALP

On Behalf of Special Issue Editorial Team

This special issue is supported by the FUSILLI project, funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000717.

Obituary

YVES CABANNES, UCL EMERITUS PROFESSOR OF DEVELOPMENT PLANNING (1952-2025)

Professor Julio D. Dávila
UCL, London

Countless colleagues and friends were deeply saddened by the news that Professor Yves Cabannes passed away unexpectedly on Sunday 12 January 2025 at the age of 72. He was a distinguished scholar, lecturer and activist in the urban field, having worked in over 60 countries in Latin America, the Middle East and North Africa, Sub-Saharan Africa, Asia and Europe. Yves had been University College London's (UCL) Professor of Development Planning between September 2006 and March 2015 when he retired from UCL. At the core of his work was a profound engagement with social justice and the respect of human rights. His research work centred around urban agriculture and food sovereignty, collective and communal forms of land tenure, and local governance, including the development of urban management tools such as participatory budgeting, a Brazilian innovation to involve local communities in making decisions about the investment budgets of municipalities.

Photo Credit: Julio D. Dávila, 2009

Yves was a passionate defender of marginalised urban communities and used his vast network of contacts among scholars, practitioners and international aid agency staff to raise awareness of the plight of thousands of people, while steering efforts to build staff capacity in municipal governments, non-governmental organisations and universities. Between 2004 and 2010 through his work as Chairperson of the Advisory Group on Forced Evictions to the Executive Director of UN-Habitat (AGFE), he supported urban people's movements and their struggles against arbitrary evictions across many countries, travelling to work with them, connect them to others, and to document their resistance.

Prior to UCL, he worked for three years as a lecturer in Harvard University's Graduate School of Design. Between 1997 and 2003 he was the Regional Coordinator of the UN-Habitat/UNDP Urban Management Program for Latin America and the Caribbean based in Quito, Ecuador. There, he oversaw the production of numerous studies and training programmes to improve the effectiveness of municipal governments, a role that saw him visiting tens of cities in the region while widening his already considerable network of contacts.

Photo Credit: Julio D. Dávila, 2024

Yves was a supportive mentor, teacher, coordinator and friend, and after his retirement returned every year to UCL to teach MSc students and collaborate with colleagues on research and activism. He was a systematic thinker with unbounded levels of energy, travelling frequently to meetings, conferences, training events, and street demonstrations in distant cities, at a pace that was only slightly reduced by illness in recent years. His considerable height and mastery of empirical facts added to the feeling of authority wherever he went, but his personal warmth quickly put people at ease. He was a consummate polyglot, who could quickly switch from his native French to Spanish, Portuguese and English. Born in Southwest France, he also spoke Languedoc and was at ease speaking Catalan. He used these qualities to great effect, from bringing people together to putting pressure on governments and international aid agencies.

His premature loss is deeply mourned by a large range of people, from leaders of poor urban communities and social movements to municipal officials, United Nations staff, former students, and friends. Our thoughts and solidarity are with Cecilia Delgado, his widow, and his children.

Obituary

IN MEMORY OF YVES CABANNES

Prof. Dr. Robert Biel, UCL

Yves and I met as colleagues when he first joined University College London (UCL), and we worked together for many years, becoming very close. We were contrasting personalities and had our differences, which made the friendship even more interesting and meaningful, and I must say he was the most loyal friend I ever had. I saw so many instances of how committed and generous he was with people, including students whose future careers he always felt a responsibility to support. With Yves, one really had a friend for life, and this is why his disappearance has left such a sense of loss, for me, and I'm sure a huge number of others.

Yves' work had many facets: the right to the city, participatory planning and design, urban agriculture, resisting evictions, community land trusts/housing trusts, alternative currencies. In each of these areas, he was a – or in many cases *the* – leading expert at a world level. Although the main focus of my practical collaboration with Yves was urban food-system planning, our discussions were usually about the cross-cutting themes which link *all* these movements. The key theme was to develop an enduring commons-based institutional focus for the struggles of the most oppressed and marginalised populations, in a way both relevant to immediate day-to-day livelihoods, and also prefigurative of a wider, emancipatory social order.

We were both rooted in the radical political tradition, and this of course traverses' phases of optimistic upsurge, and other phases where the situation appears more challenging. At such moments, when one might easily be discouraged, Yves was invariably a source of positivity. He kept his finger on the pulse of the real struggle, and never wavered in his qualities of humanity, empathy and commitment to the cause … as well as his great sense of humour.

In terms of practical application, there is something which made him an extremely *effective* operator in getting results in the real world. He possessed an astonishing intuition, so that if you parachuted him into any situation, or place, he could instantaneously sense the relation of forces and know exactly where to intervene to unblock the situation. He consciously trained himself in this faculty and kept me entertained with his explanations of how he employed strategy and tactics, notably aphorisms from the French translation of the Chinese military classic, *The Art of War* by Sun Zi, which was his constant companion. The key is always the relation between the concrete local gains and the bigger strategic picture.

We can, and must, continue to reflect on all these lessons, and re-affirm the commitment which Yves always embodied.

Planlama 2025;Supp(1):1–17 | doi: 10.14744/planlama.2025.76258

ARTICLE / ARAŞTIRMA

New Policies, Trends, and Experiences in Resilient Urban Food Systems in Türkiye in the Age of Multiple Crises

Çoklu Krizler Çağında Türkiye'de Dirençli Kentsel Gıda Sistemlerinde Yeni Politikalar, Eğilimler ve Deneyimler

Uygar Dursun Yıldırım

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ABSTRACT

Developments such as the food crisis, COVID-19, increasing drought due to global warming and earthquakes are prompting widespread discussions on how to strengthen and make cities, in which the majority of the world's population now resides, more resilient to sudden shocks, both globally and in Türkiye. As questioning of the industrial food system becomes more prevalent, crises and shocks are compelling many actors to construct new food systems centered around fresh food policies and strategies. Within this broader context, this study examines local food systems established through cooperation between international organizations, ministries, and local initiatives within the frame- work of local/rural development policies in cities in Türkiye such as Hatay, Gaziantep, Kahramanmaraş, Adana, and Mardin. These local food systems, in which newly established cooperatives play key roles, have evolved into models that bring together actors of various scales—such as women producers, small family producers, and refugees—with global organizations, ministries, and NGOs. The study focuses on these local food systems in terms of their governance mechanisms, supply chains, localization, and resilience potential. The research draws on data collected during fieldwork conducted in 2021 and 2022, as well as observations made during subsequent field visits in 2023 and 2024. Urban food systems evolving through the support and collaboration of multiple actors play a critical role in integrating small farmers, women, and refugees into the system. However, the strong influence of higher-level institutional structures also poses new challenges in building resilient systems.

Keywords: Cooperatives; governance; localization; resilience; urban food systems.

ÖZ

Gıda krizi, COVID-19, küresel ısınmaya bağlı artan kuraklık ve depremler gibi gelişmeler, dünyada ve Türkiye'de nüfusun ağırlıklı olarak yaşadığı kentleri ani şoklara karşı güçlendirme ve dirençli hâle getirme tartışmalarını yaygınlaştırmaktadır. Bu süreçte endüstriyel gıda sistemine ilişkin sorgulamalar artarken, çoklu krizler aktörleri yeni politikalar ve stratejiler etrafında gıda sistemleri inşa etmeye zorlamaktadır. Türkiye'de uluslararası örgütlerden merkezi devlete, yerel yönetimlerden gıda inisiyatifleri ve kadın örgütlenmelerine kadar birçok aktör özellikle kent ölçeğinde yeni modeller geliştirmektedir. Bu çerçevede çalışmada; Hatay, Gaziantep, Kahramanmaraş, Adana, Mardin gibi kentlerde uluslararası örgütler, bakanlıklar ve yerel inisiyatifler arasındaki işbirlikleriyle kurulan yerel gıda sistemleri ele alınmıştır. Yeni kooperatiflerin merkezi roller üstlendiği kentsel gıda sistemleri; kadın üreticiler, küçük aile üreticileri ve mültecilerle küresel örgütler, bakanlıklar, yerel yönetimler ve STK'lar gibi farklı ölçeklerdeki aktörleri bir araya getiren modellere dönüşmüştür. Yerel gıda sistemleri; yönetişim mekanizmaları, tedarik zincirleri, yerelleşme ve dirençlilik potansiyelleri bakımından değerlendirilmiştir. Çalışmada 2021–2022'de yapılan saha araştırması verileri ile 2023–2024'te tekrarlanan ziyaretlerdeki gözlemlerden yararlanılmıştır. Çoklu aktörlerin destek ve işbirlikleri çerçevesinde gelişen kentsel gıda sistemleri; küçük çiftçiler, kadınlar ve mültecilerin sistemle entegre olmasında kritik roller üstlenmektedir. Ancak üst ölçekteki kurumsal yapıların güçlü etkileri dirençli sistemlerin inşası bakımından yeni sorunlar da yaratmaktadır.

Anahtar sözcükler: Kooperatifler; yönetişim; yerelleşme; dirençlilik; kentsel gıda sistemleri.

Received: 01.09.2024 Revised: 27.01.2025
Accepted: 04.02.2025 Available online date: 18.08.2025
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1. Introduction

In recent years, in addition to the increasingly evident crises in food and ecology, the COVID-19 pandemic, earthquakes, tornadoes, floods, and wars have encouraged new approaches and searches for models in the fields of agriculture and food both in the world and in Türkiye. The food crisis, which at first glance manifests with rapidly rising prices, nutritional problems and food security issues, is closely tied to multifaceted problems that emerge in areas such as rural-urban relations, migration, employment, climate change, and the political crises they accompany. In Türkiye, which ranks among the top five countries experiencing rapid increases in food prices in recent years (Yıldırım, 2024), extreme climatic conditions such as rising temperatures and drought, along with challenges in agricultural production, employment, and urban access to affordable and healthy food, are emerging as key dimensions of the crisis. As multidimensional crises and shocks associated with natural disasters become part of daily life, development models based on economic growth and productivity are being questioned globally and domestically. In this regard, numerous actors have started to develop new models in the areas of urban food systems and ecological frameworks. Reports published by the United Nations (UN) Food and Agriculture Organization (FAO) in 2008 and 2021 have highlighted issues related to the industrial food regime and the need for policy changes in agriculture (FAO, 2008; 2021). Alongside the policies implemented by global organizations such as the European Union (EU), other countries and the World Bank (WB), which focus on sustainability, transitioning to a green economy, and inclusive policies, discussions on cooperative economies, degrowth, circular economy, and localization have become prominent topics in the process of change and transformation. A key aspect of this process is enhancing the alignment of urban food systems—from production to consumption—with ecological principles, while simultaneously building more resilient and inclusive systems capable of withstanding multiple crises and shocks.

Social cooperatives, or new generation cooperatives, have become one of the leading elements of new development programs worldwide in recent years. The cooperative policy, rooted in the concept of social and solidarity economies, represents one of the key strategies endorsed by international organizations, including the UN, the International Cooperative Alliance (ICA), the EU, and the OECD. The ICA employs the framework of social and solidarity economies to characterize the production of goods and services by various non-profit organizations and initiatives guided by principles of solidarity, ethics, and democratic governance, while simultaneously integrating ecological objectives (UN, 2014; ICA, 2020). Within this framework, cooperatives are regarded as essential entities for advancing sustainability, facilitating the transition to a green economy, enhancing livelihoods, and promoting small-scale producers and women's entrepreneurship. Spain and Italy stand out as prominent examples where advanced models of social and solidarity economies have been developed, particularly in the domains of agriculture, food systems, and social services. Businesses and cooperatives operating within the social solidarity economy contribute approximately 10% to Spain's national income and 15% to that of Italy (EU, 2022). Notably, the number of social cooperatives active in these economies has expanded significantly in Spain and Italy in the years since the 2008 financial crisis.

In countries such as Brazil, Argentina, Colombia, and Mexico, cooperative-type organizations have reemerged in the context of local development, inclusive business models, and multiple social policies (UN, 2021). It has also been noted that in Türkiye's 11th and 12th Development Plans, cooperative-type organizations will be supported to assist and empower disadvantaged groups, such as women and small family farmers. Furthermore, the new public management approach has brought flexible, accountable, and transparent governance practices to the forefront, rather than rigid, bureaucratic, and centralized structures, with an emphasis on quality at every stage (Yılmaz, 2015, p. 200).

In the face of multifaceted crises and shocks, questioning of industrial food systems has become increasingly widespread, with new frameworks of food policies and new practices and models alongside new structures being established. In Türkiye, interest in production and supply models has been growing with respect to collaboration, accountability, local scale, and ecological policy- making processes. In addition to the dominant system controlled by corporations and supermarkets, we observe the emergence of various alternative models that draw on local culture, institutions, and social movements. These models develop within short supply chains and adhere to ethical and ecological principles. The political polarization being experienced in Türkiye has also affected the agricultural and food sectors, with novel food policies being adopted in response to the crisis, which in turn has resulted in greater diversification. In certain cases, emerging agricultural and food policies have deliberately positioned themselves outside the frameworks of the central state, market, and capital. For this reason, The Hopa Agricultural Development Cooperative, the Ovacık Experience, and the Gödence Agricultural Development Cooperatives, along with food initiatives and consumer cooperatives that collaborate with small-scale farmers and women producers, all strive to establish alternative food systems in urban areas based on the principles of solidarity economy.[1]

[1] In recent years, there has been a growing body of literature on alternative food networks and cooperative efforts in Türkiye, with an increase in relevant books, articles, and theses. For examples of these studies, see Öngel and Yıldırım (2019), Özkaya (2021), and Şahin (2021).

Alongside the above-mentioned model, many local governments have started to develop rural-urban economy systems aimed at empowering small family farmers and women producers while addressing the city's need for healthy food, and utilizing the opportunities provided by amendments to municipal law. Moreover, as the operations known as the 'İzmir Model,' begun during the term of Mayor Aziz Kocaoğlu of the İzmir Metropolitan Municipality, and the Ovacık Experience, initiated by Fatih Maçoğlu, are recognized as pioneering experiences by many other local governments—including the metropolitan municipalities of İstanbul, Çanakkale, Eskişehir, Gaziantep, Konya, and Adana, as well as district municipalities such as Karşıyaka and Nilüfer—they too have also started to develop food policies and strategies. Therefore, a primary raison d'être for these cooperatives is the twofold aim of local governments' rural development policies, namely empowering small producers and addressing the city's need for healthy and affordable food. As observed in these models, the contemporary understanding of cooperatives not only aims to strengthen rural areas and agriculture but also address the economic needs of urban life and underdeveloped areas within cities, particularly those of disadvantaged communities (Yalçın, 2022, p. 16). Furthermore, these new generation cooperatives provide institutions and municipalities with the opportunity to implement comprehensive, inclusive food policies that integrate rural and urban systems.

In addition to these various models, another we will focus on in this study is the food systems that have been established through collaboration between international organizations, ministries, and local initiatives within the framework of local/rural development policies in cities such as Hatay, Gaziantep, Kahramanmaraş, Adana, and Mardin, all of whose agricultural and food systems have been affected by shocks such as drought, climate change, pandemics, and earthquakes in recent years (Özcan, 2018; Yılmaz et al., 2020; Yıldızcan, 2023). These cities also received large numbers of refugees following the outbreak of the Syrian Civil War in 2011. Thus, the food crisis and shocks resulting from natural disasters, combined with employment and social integration issues, brought to prominence the construction of new food systems, organized by governance mechanisms and institutions. This process, manifested through a new dynamic of cooperativism, has transformed into models that bring together actors a range of actors, including women producers, small family farmers, and refugees at the local level with global organizations, ministries, and NGOs.

The governance mechanisms applied within the framework of local/rural development paradigms are structured around various social policies, including the food crisis, women's empowerment, refugee social integration, and climate change. The support policies implemented within this framework are carried out with cooperative-type organizations based on new entrepreneurship, and job and employment development opportunities in the pursuit of profitability aimed at disadvantaged groups.

Thus, it is assumed that cooperatives play new roles in local development and food systems within this framework, roles which significantly differ from other models in terms of their relationship with the central state and the market, as well as in their guiding principles and values. Cooperatives in receipt of substantial support from international organizations and institutions during their establishment, development, and operations are structured according to principles such as branding, entrepreneurship, and profitability, spanning the entire process from production to sales. The roles of cooperative policies in local food systems vary considerably, involving a diverse range of actors, including international organizations, the central state, civil society components, and social movements. Beyond models integrated with the central state and market relations, cooperatives emerging from grassroots organizations—such as food initiatives, women's organizations, and ecological movements—also display notable differences in roles and principles. This study will therefore focus on the diversity of complex relations which cooperatives and food systems embrace based both on principles such as entrepreneurship, branding, and profitability as they align with market relations, and those other principles that have evolved through collaboration with the central state, local authorities, and social networks.

As will be discussed in the field data section of this study, the number of cooperatives established in recent years for agricultural development and women's entrepreneurship has increased rapidly. These cooperatives play a crucial role in food systems, bridging local production and urban consumption. They are formed within the framework of employment and integration policies aimed at small family farmers, women producers, and refugees, and they deliver to urban consumers food products produced and processed using local and traditional methods via various collaborations, support mechanisms, and digital channels. Thus, cooperatives, operating within governance frameworks, are pivotal in forging social and economic connections between production groups, ministries, NGOs, and international organizations, as well as between rural and urban areas. This study investigates the experiences of multi-stakeholder local food systems that have been established and expanded through various institutional mechanisms and policy frameworks since the onset of the pandemic, particularly in the cities of southeast Türkiye mentioned above. Grounded in the conceptualization of resilient food systems, a significant proportion of these cooperatives—key actors in the development of local food systems—were founded in the post-pandemic period. They operate within a framework of extensive collaboration and support involving diverse groups, including women, small-scale producers, and

refugee organizations, as well as institutions and organizations at both local and higher administrative levels. This study will critically examine the evolution of local food systems, fostered through cooperation between cooperatives and institutions, focusing on key dimensions such as governance, localization, and short supply chains, while assessing the opportunities and constraints these systems face in terms of resilience.

2. Literature: Urban Food Systems and Resilience

According to Akşit (2006), theoretical debates on agrarian question and the transformation of small-scale peasantry in Türkiye during the 1960s and 1970s predominantly revolved around systemic and structural processes such as modernization and capitalist influences, and their effects on rural areas. These debates emphasized diversified transformation processes. The critical literature of the 1990s and 2000s, while primarily concerned with the transformations and dislocations brought about by neoliberal capitalism—especially in the context of rural areas and agricultural systems—has evolved in recent theoretical discourse to increasingly emphasize the urban scale, thereby embedding cities within a more holistic framework. Tekeli (2015) argues that the blurring of boundaries between rural and urban areas necessitates a re-evaluation of agricultural and food issues within the context of urban systems. This perspective is reinforced by the 2016 UN HABITAT III Report, which emphasizes the importance of supporting small and medium-sized cities in enhancing food security and nutrition through cooperation and solidarity across various scales (UN HABITAT, 2017, p. 17).

As the focus on capitalism's global and local impacts has intensified, so too has interest grown in local initiatives, food organizations, official institutions, and NGOs that base themselves on agricultural and food issues. Hence, resilience, robustness, and inclusivity of food systems have become the subject of studies, especially in the face of crises and shocks.[2] Agriculture and food systems thus intersect with multidimensional problems, including the effects of climate change on food security, agricultural labor loss, migration, and employment issues. These complex challenges underscore the need to restructure rural-urban relations, making it essential to build resilient, local food systems based on ecological principles and inclusive models for marginalized groups.

The FAO and the Global Partnership for Sustainable Urban Agriculture and Food Systems (RUAF), for instance, have been approaching food systems through participatory and governance processes that involve various institutions, policies, scales, and programs (Blay-Palmer et al., 2021). Their frameworks address three main subtopics: (1) evaluating the vulnerabilities and strengths of food systems across rural and urban areas; (2) fostering continuity and planning between rural and urban areas, enhancing multi-stakeholder collaboration; and (3) coordinating actions to protect livelihoods and ensure food and nutrition security.

The concept of resilience has been greatly explored in various studies focusing on how to minimize the social, economic, and ecological risks and vulnerabilities associated with natural disasters throughout the entire agricultural and food system, ranging from cultivation, harvesting, packaging and processing, to distribution, marketing, consumption, and waste management (Ericksen, 2008; Committee on World Food Security, 2016; Ballamingi et al., 2022). Resilience involves enhancing the system's capacity to withstand future crises and shocks across all stages and scales. Studies suggest that preparing food systems for future shocks requires strengthening access to sufficient, healthy food, establishing food sovereignty, maintaining biodiversity, and preserving local and cultural knowledge (Tendall, 2015; Hospes & Brons, 2016; Dower & Gaddis, 2021).

2.1. Governance Principles in Food Systems

A significant dimension of resilient food systems is regulation based on horizontal relationships between rural and urban areas that adheres to multi-stakeholder governance principles. It has been emphasized by many scholars that effective local-scale food systems require governance mechanisms (İlhan & Kerimoğlu, 2023). Hospes (2016) also describes multi-stakeholder governance mechanisms as involving small producer groups, cooperatives, social movements, consumers, and NGOs in policy, planning, and strategy formulation to build fair and sustainable food systems within the capitalist framework. Multi-partner projects involving various institutions, civil society organizations, local governments, academics, and social movements are essential to the resilience process.

Faus and Sonnino (2018) have analyzed the concept of governance in relation to the literature on social movements and interactions across diverse localities and urban contexts. Within this framework, food policies and practices tailored to the specific needs and capacities of local settings are considered through the lens of network formation, cross-sectoral and multi-scalar collaborations, the cultivation of shared imaginaries and collective action capacities across localities, and the facilitation of knowledge and experience flows. In this context, the food planning process is structured through interactions, collaborations, and organizational frameworks

[2] The concept of 'inclusivity,' which is considered one of the foundational elements of making systems resilient, is addressed on the basis of providing goods, services, and livelihood resources to disadvantaged groups at the base of the economic pyramid and integrating them into value chains (G20, 2025; Schoneveld, 2022). In agricultural and food systems, providing opportunities such as purchasing guarantees, machinery/input support, and technical assistance to strengthen the production ties of vulnerable groups, such as small family farmers, women producers, and refugees, is seen as one of the key dimensions of 'inclusive' models. Furthermore, the empowerment of women in rural areas and the integration of their knowledge and experience into food systems is another critical feature of building inclusive, resilient, and sustainable systems (Kumar et al., 2023).

spanning multiple scales, sectors, localities, and actors. Similarly, Morgan (2009) conceptualizes the process of food policy and planning in the development of sustainable food systems as an inclusive and participatory endeavor that unfolds within communities and engages a diverse array of actors.

Moreover, effective governance processes between municipalities, administrators, and national or international organizations serves to enhance both democratic processes and urban resilience (Ballamingie, 2018). During crises, governance models that focus on local dynamics and adopt bottom-up rather than top-down methods, are more likely to produce flexible and responsive policies. Research by the FAO during the COVID-19 pandemic revealed that top-down methods often failed due to communication gaps and inadequate resource distribution (FAO, 2020a, p. 14).

Especially municipalities in cities such as Lima in Peru, Dhaka in Bangladesh, and various African cities developed partnerships with local communities to ensure effective food distribution and supply chains during the pandemic. Thus, the food systems approach requires coordination among numerous actors, from rural to urban areas, and from production to consumption, adopting a holistic perspective (Tendall et al., 2015). Strong connections between food councils and multi-stakeholder platforms through multi-scale governance mechanisms are crucial for developing suitable, flexible, and rapid policies during crises.

2.2. Short Supply Chains and Localization in Food Systems

Localization and short supply chains are also significant in building resilient food systems. The COVID-19 pandemic, along with other crises such as wars, earthquakes, and climate change-related disasters, has underscored the need for management models that are sensitive to local dynamics in food planning and policy-making processes. The literature highlights the challenges of applying a general template for food planning and the vulnerabilities of global industrial food systems in the face of shocks (Blay-Palmer et al., 2021). Localization involves developing participatory networks between city centers, surrounding areas, and rural regions, reducing reliance on distant sources for food, and leveraging local resources.

Examples such as the agricultural region of Montréal, Brazil's National Food Program, and Ontario's Golden Horseshoe Food and Farming Alliance illustrate efforts to source locally-produced food to ensure a stable supply during extreme events (Ballamingi et al., 2022; Diekmann et al., 2020). Strengthening rural-urban ties, fostering local economies, and reducing carbon emissions through shorter supply chains align with the UN's sustainability goals under Goal 11, which focuses on building resilient, inclusive, and sustainable cities (UN, 2024).

The revival of urban agriculture, local product consumption, shorter supply chains during the COVID-19 pandemic in Africa and Asia, and Bolivia's model of home delivery from peri-urban areas, demonstrate the critical role of short supply chains in ensuring rapid food supply. The EU Green Deal Agreement also emphasizes reducing transportation distances and intermediaries to expand local supply channels (AB Commission, 2020; Yıldırım & Yıldırım, 2021). Some researchers have argued that localization should be considered alongside agroecological methods, rural-urban solidarity, and producer-consumer organizations for greater resilience (Karakaya Ayalp & Yarış, 2023, p. 58). Therefore, access to sufficient and healthy food is both a quantitative issue and a process involving the preservation of traditional practices (Tendall, 2015).

In recent years, the literature has widely assumed that localization directly contributes to sustainability and resilience. However, some researchers have critically questioned this perspective. Purcell and Brown (2005) introduced the concept of the 'local trap' to challenge the presumption that the local scale is inherently the most appropriate for fostering social justice, ecological principles, and sustainable socio-economic relationships. They argue that within local communities, economic and political agendas often diverge, and power dynamics, along with conflicting interests, can hinder collective action on ecological and social justice issues. The authors highlight that localization does not inherently guarantee sustainability and stress the importance of evaluating each scale within its specific socio-political and ecological context rather than making broad generalizations. Researchers propose a dynamic theory of scale that incorporates the analysis of divergent interests and conflicts shaped by unequal power relations within food policy and planning processes. This approach challenges the bias that localization inherently enhances sustainability in food systems, and seeks to avoid what it calls the 'local trap' (Born & Percell, 2006).

2.3. Resilient Food Systems and Cooperatives

Cooperatives have (re)emerged as a prominent organizational model in building resilient food systems in recent years[3]. We observe a renewed interest in cooperative-type organizations similar to those which emerged to deal with past crises which drove large populations into social and economic turbulence. In today's neoliberal era, cooperatives are re-emerging as an alternative to address social, economic, and ecological issues where the central state and market mechanisms have proven insufficient in agriculture and food sectors. Cooperatives organized through communities, social networks, and new values, can play significant roles during crises and provide resilience in food systems against shocks (Billiet et al., 2021; Schoneveld, 2022). Based as they are on multi-stakeholder and collaborative work

[3] In this study, we address cooperatives based on the definition of these as autonomous organizations established by individuals who come together to meet their economic, social, and cultural needs and expectations through a business enterprise managed by democratic regulations (Polat, 2017, p. 19).

models, resilient food systems can be built which respect local, social and economic dynamics. We develop collective solutions and resilience during crises based on shared values and principles, participation, solidarity, and trust in social, economic, and ecological processes (Vieta, 2010; Zamponi & Bosi, 2018).

In regard to better inclusivity in food systems, it is widely acknowledged that under competitive market conditions producer and consumer cooperatives act as an umbrella for small family farmers, the rural poor, and other vulnerable groups in cities (Bijman & Wijers, 2019). Cooperatives are found to provide significant advantages in reducing production costs for small family farmers, facilitating their participation in value chains and business development processes, and connecting their products with the market (Wassie et al., 2018, p. 626; Quilloy, 2015). Moreover, as a self-help and solidarity movement, cooperative-type organizations offer small family farmers and other disadvantaged groups in rural and urban areas access to goods, services, and livelihood opportunities. Additionally, women's cooperativism is becoming increasingly common due to the patriarchal nature of agricultural and food systems and barriers faced by women in joining mixed cooperatives. Despite their involvement in all processes of agricultural food production, processing, supply, and sales, women are often excluded from management processes. Women's cooperativism is emphasized as a model for the economic and political empowerment of women, enabling them to take a more active role in building food systems (Dohmwirth & Hanisch, 2018). Field studies conducted in India, Egypt, and Kenya show that policies and projects aimed at empowering women provide opportunities to diversify activities in agricultural food systems, engage in sustainable agricultural practices, participate in decision-making processes, and access new livelihood opportunities (Kumar et al., 2023, p. 11).

3. Transformation of Food Systems and New Policy Searches in Türkiye

There was a significant transformation in the Turkish literature of agricultural and food systems from the 1980s to the 2000s. In this period, market actors such as corporations, chain markets, banks, and both large and small traders strengthened their dominance over food systems. As frequently emphasized by researchers such as Keyder (1983) and Boratav (2004), there was a continuity from the late Ottoman period through the early years of the Republic, whereby agriculture was dominated by small-scale peasantry in terms of labor, production, and ownership, with state institutions, cooperatives, and organizations playing regulatory roles in both agriculture and food markets. Mainly, the central state's support-focused agricultural policies centered around 'peasantism' (Karaömerlioğlu, 2006), and this along with efforts to keep small farmers on the land and the need to regulate food markets, constituted the core characteristics of food systems during this era.

Cooperatives, in the context of agricultural and food sector organizations, were established around national developmental goals during the early period of the Turkish Republic and began to spread in the 1960s as a result of stronger connections with social movements and peasant movements. In the 1970s, cooperativism, with the help of the social municipalism approach of CHP-led local governments in agriculture and food, witnessed a revival. In the literature, the post-1970s period is designated the neoliberal era, the era in which the foundations of the corporatization of agriculture and food systems and the entrenchment of the industrial system were established. During this period, the central state gradually withdrew from its regulatory, supportive, and protective roles in small-scale agriculture and family farming (Kuran, 2021, p. 174). The central state's withdrawal from national-level agricultural and food policies, especially in the 2000s, has led to two significant developments concerning the future of food systems in Türkiye. The first is the increasing share of multinational food companies and large capital groups like Sabancı, Koç, Yaşar, and Tekfen in sectors such as meat, dairy, vegetables, fruits, and processed foods, along with the rapid expansion of the supermarket in cities across Türkiye (Oral, 2006). Between 2014 and 2017, the number of chain markets like Migros, Carrefour, Real, Tesco, Adese, Makro, Uyum, Onur, Beğendik, Özdilek, and Happy grew by 29%, while local chains expanded by 13%. Meanwhile, the growth of discount national chains like BİM, A101, and Şok reached 72% (Ekinci, 2017).

The second major development observed in the most recent decade of the 2000s is the emergence of a new phase in which a wide range of actors—including global organizations, central governments, local administrations, and social movements—have begun to seek new policies and solutions in response to the crises and problems generated by the industrial food system. Urbanization and construction dynamics in peri-urban and rural/agricultural areas led to new regulations in the Municipalities Act in 2004 and 2012, as rising food inflation and developments in migration and employment all necessitated the development of policies and strategies to more holistically encompass both rural and urban areas in agricultural and food policies. A particularly significant recent development is the role local governments have taken on as key actors in local agricultural and food systems in Türkiye.

Another characteristic of the current period is that new food policies and experiences are developing locally in processes that are fragmented and multi-faceted. In general, multi-models which display inclusive and public-centered characteristics, and attempt to intervene in and improve the problems produced by the food crisis, are spreading in different cities with varying political approaches. Experiences of solidarity economies connecting rural to urban areas, including tea producers, cooperatives, consumer cooperatives, and local governments, as well as struggles around urban gardens in İstanbul

and the turn towards consumer cooperatives are some examples of these models in districts like Kadıköy, Beşiktaş, and Üsküdar in İstanbul since the 2013 Gezi Park protests, and in İzmir (Öcal & Erkut, 2019). Initiatives organized within the framework of solidarity economies aim to build alternative food systems outside of the central state, local governments, and market actors, based on principles of direct democracy and solidarity (Oba & Özsoy, 2023). Actors within these networks tend to organize food production and supply processes along the lines of gender equality and ecological values, without intermediaries like chain markets or companies.

As previously mentioned, the organization and agricultural support efforts conducted by Metropolitan Municipalities such as İzmir, Gaziantep, İstanbul, Çanakkale, and Adana, under the rural development approach, and the attempts of Nilüfer and Karşıyaka Municipalities to create food strategies and local-specific policy roadmaps, are among recent prominent efforts. CHP-led local governments approach agricultural and food issues within the framework of rural development and the city's needs concerning nutrition, poverty, and employment. Local regulatory policies and interventions regarding food systems are being carried out based on the city's food security issues, strengthening the ties between small family farmers and production, as well as on employment and migration policies (Yıldırım, 2019). The rural development and agricultural production-strengthening policies of metropolitan municipalities are reflected in employment data. The support policies pursued by İzmir Metropolitan Municipality under Aziz Kocaoğlu's leadership resulted in an increase in agricultural employment rates from 7.5% to 8.5% between 2008 and 2018, and in the number of farmers from 49,782 to 51,334 over the same period (Yetişkul et al., 2021, p. 270).

As is clear then, in the context of food planning in Türkiye, growing crises have significantly diversified research in food and ecology, and the shocks related to natural disasters are prompting new policies and institutional efforts. Over the last decade, and largely shaped by the dissolution of agriculture, the food crisis, pandemics, and earthquakes, the central government, the Ministry of Agriculture, the Ministry of Customs and Trade, and international organizations such as the FAO, ILO, UNWOMEN, EU, and WB, have been collaborating with local governments in efforts to build resilient, inclusive systems (KEİG, 2015). Another model in which ministries and international organizations are active involves policies aimed at improving agricultural and food systems, intertwined with social policies focused on women and refugees. Within this governance framework, the empowerment of women producers, refugees, and small family farmers, and the branding of traditional, local food products to create new opportunities for profit and entrepreneurship, are among the key goals. In particular, cooperative-type organizations play an essential role in strengthening these disadvantaged groups and running multi-dimensional social policies in areas such as food, gender equality, and refugees (Gültekin et al., 2024). As briefly summarized above, it may be observed that while urban and local-scale policies and practices are spreading in the field of agriculture and food in Türkiye, so too are models diverging according to the specific social, political, and economic characteristics of different cities.

4. Field Findings

4.1. Aim and Method

In recent years, rapid changes and new developments have been occurring in the field of agriculture and food in Türkiye, in terms of planning, policy, and implementation. Particularly after the COVID-19 pandemic, new models and organizations aimed at meeting the local needs in the agricultural and food sectors have emerged in numerous cities, such as İstanbul, İzmir, Ankara, Gaziantep, Kahramanmaraş, Hatay, Mardin, Şanlıurfa, Mersin, and Adana. While the search for new policies and organizational structures has diversified, at the same time, collaborations between international organizations, NGOs, the provincial branches of the central government, local governments, and other professional associations at the local level have been attempting to establish new food systems, from production to sale, in these cities.

These systems have two dimensions: the first involves organizing production and sales around cooperatives between cities, surrounding areas, and nearby rural regions, supported by numerous institutions through funds, grants, and land. The second dimension is about how models centered on agricultural and food policies that focus on supporting small producers intersect with various goals such as women's empowerment and refugee social cohesion and integration policies. The aim of this study is to analyze one of the emerging models, which is built around cooperatives where multi-stakeholder governance mechanisms are collaborative and involve joint management systems. In this context, within the framework of resilience discussions, this study seeks to examine how these governance mechanisms function and the roles that short supply chains and localization play within this model.

As for providing an answer to the study's questions, we benefit from the field data based on a research report conducted jointly by the Ministry of Labor and Social Security's Directorate General of International Labor Force (TCÇSGB) and the German International Cooperation Agency (GIZ) between 2021– 2022 and published as a book in 2024. This report, titled 'The Effects of Cooperatives on Employment and Social Cohesion,' was carried out in cities such as İstanbul, İzmir, Ankara, Gaziantep, Kahramanmaraş, Hatay, Mardin, Şanlıurfa, Mersin, and Adana (TCÇSGB & GIZ, 2023). As is known, rapid urbanization, population growth, and the rapid transformation of rural/agricultural structures, coupled with intensive refugee migration, are processes that significantly

affect these cities. Qualitative methods were employed in the field research, which was structured around questions concerning the operational mechanisms of local food systems, institutions, governance processes, supply chains, and localization. Within the scope of the field study, 58 interviews were conducted with various agents, including cooperative members, local governments, international organizations, and NGO experts in the areas of agriculture, food, ecology, gender equality, and refugee policies. [4]

Questions were posed to cooperative members, experts, and bureaucrats accessed through the snowball sampling method about cooperatives' operational processes, relationships with institutions collaborating in the process from agricultural production to sales in urban areas, and topics related to disadvantaged groups. Although the field research focused primarily on cooperatives, extensive data and observations were collected regarding multi-agent structures, supply chains, and localization processes developed around the production, processing, and supply practices of food within rural-urban relationships. Therefore, in this study, cooperatives are not viewed as single entities conducting economic and social activities, but rather as dynamic actors embedded in local systems shaped by spatial dynamics, built through relationships and collaborations among institutions and organizations operating across multiple scales.

4.2. General Dynamics Affecting Urban Food Systems

A significant number of the cities within the scope of the field research have been experiencing rapid urbanization, construction, and population increase in recent years, while also possessing significant potential for agricultural production. Despite this potential, in cities like Gaziantep, Hatay, Adana, and İzmir, rural populations and agricultural labor have been declining over the past decade, while at the same time, there has been a strong trend toward marketization in food supply processes. In another research study, which focused on small family farmers in İzmir, it was found that 56% of the interviewed farmers were unwilling to continue production, as they were negatively affected by rising input costs (Yılmaz et al., 2020, p. 116). Similarly, in recent days, farmers affected by extreme heat and drought, who protested the inability of market prices to cover their costs, organized a convoy with tractors and blocked the Kahramanmaraş-Gaziantep highway (Keber & Yaşar, 2024). In the related news, it was mentioned that tomato, wheat, cotton, and watermelon producers were being severely affected by low market prices.

It is also worth noting here that Gaziantep, Kahramanmaraş and other cities in Türkiye's Southeast Anatolia are among those most affected by climate change in Türkiye in recent years (Selçuk & Gülümser, 2023, p. 437). In particular, wheat, corn, fresh fruit, vegetables, and cotton are among crops most affected by the impacts of climate change, with predictions of declining productivity due to climate change effects by 2050. In Gaziantep's İslahiye and Şehitkamil districts, as well as in many villages with large agricultural areas, vulnerability to the effects of climate change and drought has been found to be quite high (İpekyolu Kalkınma Ajansı, 2019). It is expected that this process will result in direct effects on water resources, soil, cropping patterns, crop yields, food prices, and social change.

What's more, the city centers and outlying districts of Gaziantep, Hatay, Kahramanmaraş, and Adana are among the cities most affected by the February 6, 2023 earthquakes. Of Türkiye's plant production value, 20.9% derives from this region; 33% of corn, 72% of cotton, 57% of citrus fruits, 82.7% of pistachio nuts, 19% of wheat, and 16% of olives respectively are produced in the eleven cities affected by the earthquakes (TMMOB, 2023). According to the TMMOB report, the earthquakes caused significant losses of livestock, with nearly 13,000 barns destroyed, and various damage to food warehouses belonging to both the private sector and the Turkish Grain Board (TMO) in city centers. The earthquakes accelerated the abandonment of agriculture and rural areas, while also causing a reverse effect whereby 800,000 people sought refuge in rural villages in some areas (Yıldızcan, 2023, p. 19).

It is also well known that small-scale retailers like grocers, butchers, and greengrocers have struggled to survive amid intense competition with large chain markets, in which they lose their significance within urban economics (Sarı, 2019, pp. 233– 234). In cities like Gaziantep, Hatay, and Kahramanmaraş, a rapid marketization process in food supply chains has been observed, paralleling nationwide trends. It is estimated that in Gaziantep the total number of markets, including those in districts, has approached 700, with the number of chain markets such as Migros, Bim, A101, and Şok reaching 450 (Olay Medya, 2021). In cities like Gaziantep, Adana, Hatay, Kahramanmaraş, and Adıyaman, chain markets account for 70% of the food retail sector. Similarly, in İzmir, since the 2000s, the share of grocers in the food supply chain and retail sector has been steadily declining, while the share of chain markets has been rapidly increasing (Candemir, 2010). İzmir is also known as the city where the first hypermarket in the Middle East and the Balkans, Alsancak Migros, was opened, making it a symbol of marketization in food retailing (Migros, 2011).

To sum up, growing risks in the food market—such as marketization, climate change, and shocks related to earthquakes—are creating significant vulnerabilities among producer groups within agricultural and food systems. Existing market actors and food companies are inadequate in the face of increasing

[4] The field research and the report titled 'The Effects of Cooperatives on Employment and Social Cohesion' involved researchers, Prof. Dr. Aylin Çiğdem Köne, Prof. Dr. Çağatay Edgücan Şahin, Assoc. Prof. Dr. Ferit Serkan Öngel, Assoc. Prof. Dr. Mehmet Cevat Yıldırım, and Dr. Uygar Dursun Yıldırım.

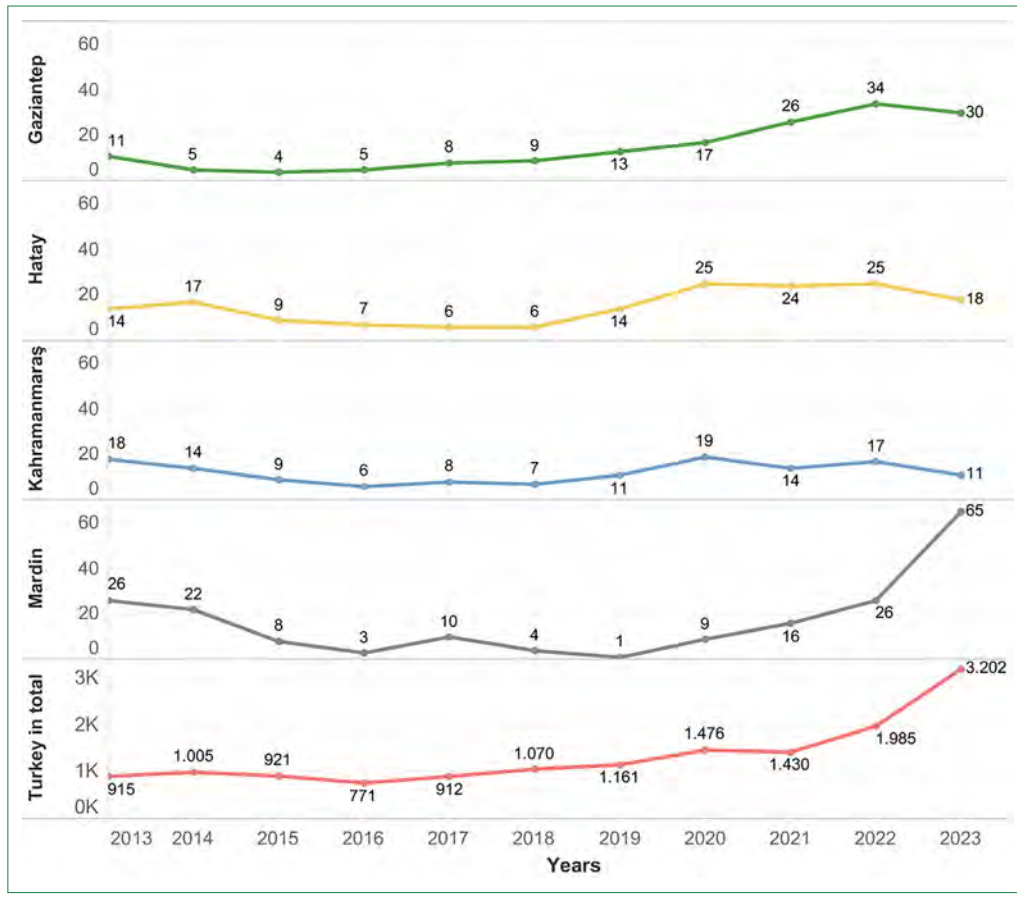

Figure 1. Changes in the number of cooperatives by year across Türkiye and in different cities (2013–2023).

risks and vulnerabilities to agricultural and food systems, nature, and biodiversity. As a result, strategies, organizations, and experiences surrounding new agricultural and food policies are emerging within the governance mechanisms and local initiatives of these cities. The most striking change within these organizations has been observed in cooperatives. As seen in the Figure 1, there has been a steady and rapid increase in the number of new cooperatives established over the past 10 years. As discussed below, this increase is emerging within the framework of building resilient and inclusive local food systems in response to existing risks and shocks in different cities. These cooperatives are positioned at the intersection of multiple social policies concerning agriculture, food, women, and refugees in local areas, and have become post-earthquake hubs for collecting and distributing aid and support.

According to the 2000 census, there were 37 cooperatives in Gaziantep engaged in agricultural development and sales, two of the most prominent being Güneydoğu Birlik and ÇukoBirlik (TMKB, 2001). These cooperatives are organized around the production and processing of products such as grapes, legumes, red peppers, olive oil, and pistachios. In the intervening period, the number of members affiliated with Güneydoğu Birlik reached 11,000. By 2019, the total number of cooperatives in Gaziantep had reached 200, with the number of producer members increased to 27,000 (Koopbis, 2019). As shown in the Figure 1, there has been a consistent increase in the number of cooperatives established in other cities included in the field research, as well as across Türkiye, particularly from 2019 and 2020 onwards.

Additionally, it has been observed in other field studies conducted in rural areas of cities like Kahramanmaraş, Gaziantep, and Hatay, that imece culture (a traditional form of communal labor) was revived in the wake of the earthquakes, and nearly all the land of farmers who lost their lives in the earthquakes has been recultivated by their relatives or those close to them (Gülçubuk & Oğuz, 2023; Yıldızcan, 2023). Following the earthquakes, cooperatives in Gaziantep, Hatay, and Kahramanmaraş that were initially unable to carry out their routine activities assumed crucial roles in the social and economic reconstruction process in the wake of the destruction and loss. Observations from visits to these cities in June and July 2023 revealed that these cooperatives continued their operations in aid collection and distribution, as well as in maintaining food supply. During this period, various solidarity organizations, aid agencies, and foreign entities seeking to provide support established contact with the cooperatives in the region. Given that,

we may say governance processes and cooperativism emerge under extraordinary circumstances such as food crises, climate change, pandemics, and earthquakes, especially for those who focus on agricultural food production and processing.

4.3. Governance Processes in Local Food Systems

In the cities covered by the field research, especially following the COVID-19 pandemic, it was observed that global organizations such as the FAO, ILO, WB, UN Women, as well as the provincial branches of the Ministries of Agriculture and Commerce, municipalities at the district and provincial levels, NGOs, and producer and women's organizations, were all actively producing inclusive policies and projects. The policies carried out by different institutions and actors at the global, national, and local levels demonstrate a variety of characteristics. For instance, in 2022, the World Bank (WB) announced a $341 million loan to develop sustainable, competitive, and climate-sensitive agricultural systems in Türkiye (WB, 2022). The development of agricultural and food systems encompasses long-term sustainable growth, the creation of new job opportunities for young people, the prevention of outward migration, the elimination of gender inequalities, and the enhancement of welfare in rural areas. The FAO also outlines the three main outcomes of its support as the restructuring of agri-food systems, the revitalization of agricultural labor markets and the empowerment of rural communities (FAO, 2023). In the Ministry of Agriculture's rural development policies the focus on small producers is of particular significance. The provincial branches of ministries, local governments, and NGOs links to international organizations such as the UN provide extensive support, including prices for products, inputs (credit, fertilizers, pesticides, machinery, seedlings, seeds, land allocation), income support (grants and fund transfers), and training/legal information support (Kuran, 2021, p. 50). In addition to UN-affiliated organizations like the ILO, FAO, and UNDP, NGOs linked to the WB and the EU are actively providing support in the form of grants, machinery purchases, and training within the scope of various policies and projects in the region. Projects and support mechanisms developed in cooperation with local state institutions and local governments play a significant role in both the establishment and development of cooperatives and in the construction of local food systems, spanning stages from production and processing to supply and consumption. It is evident that new policies and institutional frameworks have emerged in the field of agriculture and food particularly after the COVID-19 pandemic in cities such as Gaziantep, Kahramanmaraş, Hatay, and Adana, alongside a new dynamic of cooperativism.

4.3.1. Small Producers, Women and Governance Processes

The primary target groups of these institutions and cooperatives comprise women, refugee groups, and small farmers. In the establishment processes of cooperatives, therefore, women are often the ones who undertake the tasks on a voluntary basis, have no regular income, need additional income, and are motivated by the desire to work collaboratively (TCÇSGB & GIZ, 2023, p. 18). The majority of women seeks to integrate their domestic labor or products from their fields into cooperative networks, but have limited access to credit and capital resources and lack opportunities to be employed. In cities such as Adana, Mardin, Gaziantep, and Hatay, agricultural development cooperatives and women's initiative production and management cooperatives provide regular support by purchasing products produced by small family producers and refugee women in homes and fields. Producers and women are involved in the economic and managerial activities of cooperatives since they take a role in social and spatial networks such as NGOs, local governments, ministries, and international organizations. Collaborative activities open pathways for these groups to engage in local food systems, while also facilitating spatial cooperation within the city region and breaking down gender-based barriers. It has been mentioned that when women producers in an agricultural cooperative first went to sell their products in Adana's wholesale market, they were initially met with surprise by the predominantly male traders, but once they actively began taking on a role in the cooperatives, they were able to sell their products easily (M. H., Cooperative Chairwoman, Adana, 28.07.2022) (TCÇSGB & GIZ, 2023, p. 71).

Through global organizations, NGOs, and local governments, the support often extends from the production of agricultural food to processing and eventually to sales. In this context, the cooperatives and small producers in Gaziantep and Hatay benefit from support for drying and packaging machines, seedling and seed distribution, vocational/technical training, free sales areas, and contract purchases. Additionally, there are examples of rent for buildings and personnel expenses being covered by district and provincial municipalities, NGOs, and various organizations affiliated with the UN and WB. In the FAO's rural development policies, besides strengthening agricultural production, input support is provided in organizing groups such as women, small family producers, and refugees. Likewise, NGOs affiliated with the WB support urban-centric projects aimed at empowering women's entrepreneurship and bringing women's labor to market through branding efforts. Furthermore, district governorships and municipalities support agricultural lands, shops, and sales points. Many cooperatives operating in Gaziantep, Hatay, and Mersin run restaurants and kitchens supported by various institutions within the scope of comprehensive aid programs.

> *"Through the protocol of cooperation with the municipality, we have been provided with a production site and a restaurant. The basic equipment such as maintenance machines, packaging machines, dough kneading machines, mixers, external packaging machines, etc., were also acquired with*

Table 1. Governance processes and actors

Institutions	Policies	Support processes	Target groups	Social objectives
UN FAO	Empowerment of agricultural production	Funds and grants	Funds and grants	Job and employment development
UN ILO				
UN UNWOMEN		Machinery and equipment purchases	Machinery and equipment purchases	
UN UNDP	Empowerment of women and refugee groups			Promotion of entrepreneurship
WB		Land, store, and stand allocations	Land, store, and stand allocations	
EU				
GIZ	Mitigating climate change ımpacts and sustainability			Branding of local/ traditional food products
Ministry of Customs and Trade				
Ministry of Agriculture and Forestry	Local/rural development			
Local Governments				
NGO'S				

Prepared by the researcher based on field data.

> *support from an NGO and the Metropolitan Municipality."* (Cooperative Member, 19.10.2022, Hatay) (TCÇSGB & GIZ, 2023, p. 37)
>
> *"Had our director not allocated a total of 30 decares of land for organic farming, we would not have been able to achieve this. We received significant support from nearly all institutions in Nurdağı. The Chamber of Agriculture and the District Directorate of Agriculture were particularly helpful in terms of sales. We received training support from UN Specialized Agencies. We also receive product development and marketing support from the FAO."* (Cooperative President, 20.10.2022, Gaziantep) (TCÇSGB & GIZ, 2023, p. 37)
>
> *"The municipality has now distributed more than three million seedlings. In addition, they provide support for procurement, logistics, and fertilizer."* (Cooperative President, 21.10.2022, Adana) (TCÇSGB & GIZ, 2023, p. 38)

Support provided through collaborations between institutions, international organizations, and NGOs can reach cooperatives and producers in district centers such as Altınözü, Defne, Kırıkhan, Nurdağı, and İslahiye in Gaziantep and Hatay. Since these supports are delivered through direct purchases, they can also reach the products of small producers in rural areas surrounding the district centers. For instance, the '*Topraktan Tabağa*' Agricultural Development Cooperative in the center of Mardin, was able to regularly purchase locally sourced, chemical-free products grown from heirloom seeds from small family farmers and women producers in the districts. These products are then distributed to consumers through cooperative-owned stores in the city center and via social media channels.

In these examples, we see that cooperatives act as intermediaries connecting producers in the rural periphery and urban members and markets. Unlike the dominant food system, cooperatives attempt to find a place in the market by offering products that prioritize the health of consumers while protecting the interests of small producers through fair prices. Thus, cooperatives operating within the framework of governance mechanisms can support sustainable production and offer flexibility in reaching vulnerable groups in the rural and urban periphery, positively contributing to resilience.

Collaborations between ministries, international organizations, and NGOs, which have created multi-dimensional partnerships, prefer more inclusive business models, such as cooperatives, over companies and markets for production, processing, and establishing distribution channels. Joint projects carried out by institutions in cooperation with small producers, women's organizations, and cooperatives enable the application of more flexible policies that are responsive to local needs such as food security, new livelihood and employment opportunities, and the inclusion of disadvantaged groups. It is widely accepted that multi-stakeholder, participatory food production, processing, and supply models are more inclusive compared to traditional, hierarchical methods of service delivery, which are typically top-down, as seen in central governments and companies.

Various groups, including women, small family producers, and refugee women, are able to participate in the local-scale production and processing of food through governance processes and cooperatives. This model, in which cooperatives play intermediary roles from production to consumption, is shaped around extensive support from numerous institutions at a higher level (Table 1).

4.4. Supply Chains and Localization

The cooperatives are established and operated within the social networks in local food systems extending from nearby rural/agricultural areas to kitchens and restaurants, sales points in urban centers, and digital platforms. In this sense, cooperatives are structured on a local scale, linking rural/agricultural areas located on the peripheries of cities to urban centers, where food is processed in kitchens, restaurants, and sales points. Most cooperatives continue to work with women, refugees, and small producers who remain connected to agricultural activities in rural areas but have been heavily affected by the recent food crisis. These groups often face challenges in bringing their products to the market at prices that ensure their livelihoods.

One employee of a cooperative in the center of Mardin explained the purchases they make from nearby small producers as follows: "*Pepper producers from Siverek, tomato growers from Karacadağ, and later, small farmers cultivating 1– 2 acres of land in villages started coming to us. Currently, our cooperative has 48 farmers producing 170 different products*" (TCÇSGB & GIZ, 2024, p. 30). Cooperatives like the Mardin '*Topraktan Tabağa*' Agricultural Development Cooperative, the Kahramanmaraş '*Mutlu Besinler*' Agricultural Development Cooperative, and the Adana 'Meryem Kadın' Cooperative make regular purchases from small producers who cannot sell their products at sustainable prices. During field visits, we observed that many producers were struggling to sell their products at fair prices, while intermediaries, moneylenders and supermarket chains buy their goods at much lower rates. In places like İskenderun, İslahiye, Defne, and Kırıkhan, many cooperatives active in food production and processing regularly purchase from producers in nearby rural areas. In some instances, cooperatives have chosen to produce items that were previously not grown in their region, rather than sourcing from geographically distant agricultural areas. For example, a cooperative in Hatay's Yayladağ district has started mushroom and flower production, while another cooperative in Nurdağı has initiated the cultivation of moringa, a new crop for the area, on 50– 60 acre of land, contributing to the local economy.

4.4.1. Food Produced Through Local Knowledge and Methods

Moreover, one of the core elements of local food systems is traditional and additive-free production methods and knowledge that women transfer from their homes to the cooperative. In this regard, women's traditional, additive-free production methods are considered a key component of food security.[5] In another example, the municipalities of Adana and Mersin are collaborating with small producers

Figure 2. General characteristics of food products in local food systems.

to support production using agroecological methods and local heirloom seeds, taking steps to promote food security. Such 'healthy, additive-free' products provide significant advantages to cooperatives in a food market dominated by large supermarket chains. The differentiated products of cooperatives include dried, processed, and high value-added packaged foods. For instance, a cooperative member in Mersin mentioned that they produce nine different products, including banana chips, banana flour, and banana mixtures, as well as sports drinks, all made from dried and processed bananas. Pasta, noodles, breakfast jams, tomato paste, and sauces are among the most commonly produced and sold items at cooperatives. Additionally, local cooperatives mostly purchase heirloom seeds, local wheat varieties, and fruits grown without chemical fertilizers (Fig. 2).

4.4.2. Supply, Distribution, and Sales Processes

The subject of our research follows a policy of delivering goods directly to consumers without intermediaries, and this has been followed up in the supply, distribution, and sales processes. The production and supply chains, centered around cooperatives, women's organizations, small producers, and refugees, extend from fields to kitchens and restaurants, and from sales outlets (shops) to e-commerce platforms. Particularly, e-commerce platforms and stores/sales points allocated by institutions like governorates and municipalities play a crucial role in ensuring that products are 'additive-free' and

[5] In this study, the concept of food security has been employed within the framework defined by Şık (2018). According to this definition, food security refers to approaches that prevent, neutralize, or eliminate various risk factors of physical, biological, and chemical nature that may cause foodborne illnesses or diseases during the processes of harvesting, transporting, processing, preparing, storing, and delivering food to the end consumer. Thus, efforts made to delay the spoilage of food are also considered an essential component of food security initiatives (Şık, 2018).

Figure 3. Local food systems from production to sale.

'healthy', especially for those who apply traditional household methods and reach the food market and consumers. Therefore, the final stage of local food system is the sales/marketing phase, which involves the following channels: Digital platforms through which cooperatives sell their products include social media channels, Instagram, e-commerce platforms like Hepsiburada and Trendyol, and cooperative e-commerce sites like hepyerinden.coop. Some cooperatives in Hatay have expanded their markets by making agreements with consumer cooperatives even in other cities. Therefore, the new food systems developing locally are nourished not only by collaborations between different institutions, organizations, and NGOs but also by solidarity relationships among cooperatives (Fig. 3).

It has been observed that both cooperatives and NGOs often make supportive social purchases through quite diverse sales channels, and a large portion of the financial cycle of cooperatives comes from purchases made by supporting institutions. Many cooperatives have developed a high dependence on external support in the production, processing, and sales processes, but this is not to say that the connections between cooperative production and marketing/sales channels are strong and stable. Indeed, the supportive position of numerous institutions in the establishment of local food systems is a risk in terms of the financial independence of producers and cooperatives. Nevertheless, cooperatives still place great importance on product promotion and advertising, including the use social media effectively, and they even work with experts who can quickly increase their sales without the support of other institutions.

Some of the principles specific to the market economy, such as profitability, efficiency, branding, and entrepreneurship, and institutions, have been adopted within the local food systems by experts from NGOs and official institutions, as well as cooperative members. Cooperatives themselves also attempt to enter the market with food products produced and branded under discourses of 'healthy, additive-free, organic, traditional'.

It was also observed in cities such as Mersin, Gaziantep's İslahiye, and Hatay's Defne and Yayladağı, that some cooperatives conduct production activities with "zero waste" goals. Many cooperatives are working to compost their waste products and reuse them in production, demonstrating a commitment to sustainability. The integration of local knowledge and production methods based on ecological principles and inclusivity into branding and market adaptation is one of the leading characteristics of these local food systems. In addition, branding and market integration, the support of disadvantaged groups, the revitalization of local traditional production knowledge and flavors, and the focus on food safety-driven production, as well as the utilization of vacant lands, constitute other defining aspects of local food systems.

5. Conclusion

Many crises in the world, such as the 2008 Crisis financial crash, COVID-19, sudden climate events, and earthquakes have given rise to new debates, in which strengthening cities against sudden shocks, and making them resilient are commonly discussed. In these discussions, and especially those on resilient and inclusive cities, there are some recurring topics; ensuring food security against shocks, establishing supply chains for food suitable for human health, supporting small-scale producers, and expanding food communities

strengthened by cooperatives. While there is general agreement on these topics, at the regional level, we encounter heterogeneous and diverse solutions, policies, and models in response to the multiple challenges, since despite the crises and problems it generates, the industrial food system continues to dominate and thus compels a wide range of actors to develop new coping strategies, models, and policies.

One of the characteristics of such a crisis is that central government seeks new policies for local food systems. Similarly, in Türkiye, in recent years, urban areas have become spaces where various actors—ranging from the central government, local administrations, social movements active in food and ecology, various NGOs, and global organizations—are striving to produce policies and projects related to food. We have focused on the local food systems being built at the urban level by international organizations, ministries, local administrations, and NGOs, along with local social initiatives. The study utilizes data from field research conducted and documented by the Ministry of Labor and the German International Cooperation Agency in cities such as Gaziantep, Kahramanmaraş, Adana, and Hatay. The central focus of the research is on the newly- evolving local food systems and cooperatives shaped in recent years by governance processes in these cities. The food systems constructed along the line of relationships spanning production to sale, encompassing city centers, surrounding districts and rural regions, are examined in this study in terms of governance, supply processes, and localization dimensions.

Based on the field research conducted between 2021 and 2022, as well as observations from visits to the same region in 2024, the data and findings highlight that, particularly in the post-COVID-19 period, a new cooperative dynamic system has emerged within a multi-actor structure extending from global to local levels. The efforts of institutions to build resilient systems in agriculture and food, policies aimed at strengthening small-scale family farming and women, and policies targeting employment and social integration for refugees are the primary drivers of these efforts.

This study has attempted to conceptualize local food systems, since the activities of the aforementioned institutions in cities like Gaziantep, Hatay, Kahramanmaraş, and Mardin specifically emerged out of the relationships and processes all the way from production and processing, to supply to sale of food between rural and urban areas. Therefore, we suggest that the cooperative dynamic in these cities may only be understood in terms of the roles these organizations play within the local food systems. In other words, cooperatives established for agricultural development and women's entrepreneurship are not independently functioning units, but rather institutions founded and operated in line with the policies and extensive supports of various institutions. The construction of resilient, inclusive, and locally distinctive food systems, spanning rural to urban, from production to sale, develops and is nurtured by collaborations, projects, and social networks between institutions, NGOs, and cooperatives.

Local food systems are built on a broad institutional structure that includes rural branches of central government, local administrations, international organizations, and NGOs. These projects, based on large-scale funding, grants, and equipment support, are largely structured by international organizations and the rural branches of ministries. However, local civil initiatives—composed of women, small-scale producers, and refugees—are able to participate in these structures only in a limited way. The stronger institutional structure at higher spatial scales results in weaker organic connections with the dynamics of the local community. In brief, we found that the relative weakness of local initiatives and the dependence of food systems on the support of national and global institutions negatively impact the system's resilience capacity.

We have observed in the field that women participants in food production and management tasks learn from each other, and try to create new public spaces for themselves. Therefore, the role of women's organizations in the construction of local food systems is quite significant. Additionally, we have mentioned various reports indicating that the rate of informal employment among women working in agriculture in the region is notably high (İpekyolu Kalkınma Ajansı, 2015). In the cooperative examples we have addressed here, membership requires legal procedures, and in many cases, the supporting institutions have included women members actively involved in the production and management work of cooperatives within the social security system. Thus, the strengthening of local food systems in the future may not only mean the inclusion of more producer and refugee women, but also may create positive effects on women working in informal employment.

However, excessive dependence on multi-actor funding and grant support raises concerns about the capacity of small producers, women, and refugee organizations to develop and implement their own policies. In other words, governance structures operating with the backing of substantial budgets and expertise from global, national, and local organizations and institutions should progress in a way that strengthens the potential of vulnerable groups—particularly those most affected by existing crises and shocks in the region—to develop food policies and organize themselves.

In the cities we visited during our research, the majority of the products derived from traditional local knowledge and methods of production had a significant place within the local food systems built around cooperatives. Women producers' knowledge of home-based, 'additive-free' production, heirloom seeds, agroecological methods, and the food processing and culinary culture of Syrian refugees are recognized as

the core components of local food. Cooperative members and experts place great emphasis on the safety of food produced using traditional, healthy, and additive-free methods. As concerns about products filling supermarket shelves under the industrial food system grow among the general public, interest in women producers' and cooperatives' products is increasing. Along with the importance placed on sustainable production methods, marketing these products through nearby retail stores, restaurants, and shops also provides opportunities to reduce the carbon footprint.

Based on the discussions thus far, it may be argued that the construction of resilient and sustainable food systems within multi-actor governance structures evolves as an inherently contradictory process. While a bureaucratically and financially powerful institutional framework exists at the top, we observe the emergence of new, dependent, and struggling social initiatives at the grassroots level. This process provides significant opportunities for the inclusion of women producers and refugees in food systems, enabling these actors to carve out a place in the market by producing niche products. In other words, compared to the dominant food system characterized by strong patriarchal production and ownership structures, local food systems exhibit more inclusive characteristics. However, the social policies produced by multinational organizations, state-affiliated institutions, and NGOs, accompanied by financial support mechanisms, significantly shape local social and economic networks as well as self-organized structures. The influence of higher-level actors in shaping local contexts raises concerns about the independence of cooperatives. Therefore, implementing support policies that provide greater space for local knowledge, experiences, and self-organized initiatives in food policies and planning processes tailored to the local context is crucial for strengthening resilience. Hence, to conclude, while multi-actor support policies have served as an important starting point in the cities under study, looking to the future, it would appear that fostering horizontal, solidarity-based networks among small-scale producers, women, and cooperatives—both within and across cities—through collaboration with other emerging cooperatives and food initiatives would serve to further enhance their resilience potential.

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Planlama 2025;Supp(1):18–34 | doi: 10.14744/planlama.2025.55798

ARTICLE / ARAŞTIRMA

Integrated and Sustainable Food Systems in the Context of the WEF Nexus Approach: An Assessment of Istanbul, Ankara, and Izmir

WEF Nexus Yaklaşımı Bağlamında Entegre ve Sürdürülebilir Gıda Sistemleri: İstanbul, Ankara ve İzmir Üzerine Bir Değerlendirme

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ABSTRACT

Urbanization, climate change, population growth, and resource limitations create significant challenges for sustainability and security in food systems. Despite advancing technology, the increasing number of people who cannot access safe food and the likelihood that this number will continue to rise due to global challenges necessitates a new approach in policy decisions related to food systems. In this context, terms like integration, interrelatedness, and Nexus have become central in the literature, as they are crucial for ensuring the resilience and sustainability of food systems in the face of negative externalities. Given the current food crisis, it is essential to evaluate these limited resources, which are directly or indirectly interconnected, in planning and implementation processes. The WEF Nexus approach, which explains the relationships between water, energy, and food components and aims to optimize them, is a concept that can respond to the sustainability framework. This study aims to explain the impact of the WEF Nexus on the sustainability of food systems. In this research, which examines urban policy decisions in the context of the WEF Nexus and specifically in food systems, Istanbul, Ankara, and Izmir, Türkiye's three largest metropolises, were selected for evaluation. Policy decisions affecting food systems and addressed by local governments have been analyzed qualitatively and quantitatively within the context of the WEF Nexus approach. These analyses highlight the need to ensure policy coherence in areas such as "waste management," "climate change," "education/awareness," "disaster management," and "logistics/IT" to achieve sustainable food systems.

Keywords: Integrated planning; sustainable food systems; Türkiye; WEF nexus.

ÖZ

Kentleşmenin yol açtığı arazi tahribatı, iklim değişikliği, nüfus artışı ve kaynakların kısıtlılığı gıda sistemlerinde sürdürülebilirlik ve güvenlik açısından çeşitli zorluklar yaratmaktadır. Gelişen teknolojiye rağmen güvenli gıdaya ulaşamayan insan sayısının artması ve bu sayının küresel zorlukların etkisiyle giderek artacak olması, gıda sistemlerine ilişkin politika kararlarında yeni bir yaklaşımı zorunlu kılmaktadır. Bu doğrultuda literatürde entegrasyon, ilişkisellik ve Nexus terimleri öncelikli hale gelmektedir. Bu terimler, olumsuz dışsallıklar karşısında gıda sistemlerinin dayanıklılığını ve sürdürülebilirliğini sağlama açısından önemlidir. Çünkü gıda krizinin gündemde olduğu bu dönemde, planlama ve uygulama süreçlerinde doğrudan veya dolaylı ilişkide olan bu kısıtlı kaynakların birlikte değerlendirilmesi gerekmektedir. WEF Nexus yaklaşımı ise; su, enerji ve gıda bileşenleri arasındaki ilişkileri açıklayarak ve optimize etmeyi hedefleyerek sürdürülebilirlik çerçevesine yanıt verebilecek bir kavramdır. Bu çalışma, WEF Nexus yaklaşımının gıda sistemlerinin sürdürülebilirliği üzerindeki etkisini açıklamayı amaçlamaktadır. Kentsel politika kararlarının WEF Nexus yaklaşımı bağlamında ve gıda sistemleri özelinde incelendiği bu araştırmada, değerlendirmek üzere Türkiye'nin en büyük üç metropolü olan İstanbul, Ankara ve İzmir seçilmiştir. Yerel yönetimler tarafından ele alınan ve gıda sistemlerini etkileyen veya etkileme potansiyelinde olan politika kararları, WEF Nexus yaklaşımı çerçevesinde nitel ve nicel olarak analiz edilmiştir. Bu analizler üç metropol özelinde, sürdürülebilir gıda sistemlerine ulaşmak için "atık yönetimi", "iklim değişikliği", "eğitim/farkındalık", "afet yönetimi" ve "lojistik/BT" gibi alanlarda politika tutarlılığı sağlama gerekliliğini vurgulamaktadır.

Anahtar sözcükler: Bütünleşik planlama; sürdürülebilir gıda sistemleri; Türkiye; WEF nexus.

Received: 22.08.2024 Revised: 06.03.2025
Accepted: 29.03.2025 Available online date: 18.08.2025
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TMMOB Şehir Plancıları Odası

Introduction

In the 21st century, various internal and external factors such as pandemics, wars, earthquakes, land degradation, climate change, and population growth, which significantly impact urban areas, are leading to the scarcity of natural resources, thereby jeopardizing the sustainability of food systems. Food systems are heterogeneous systems that establish direct or indirect relationships with water and energy components during production, distribution, consumption, and post-consumption processes, and they involve many internal and external factors. The continuity of these relationships, and thus the sustainability of food systems, are put at risk due to the depletion of natural resources. This is because these global challenges not only have negative effects on the supply of clean water and energy production, but also disrupt the balance between supply and demand, thereby affecting the sustainability of food systems (de Andrade Guerra et al., 2021).

According to United Nations (UN) reports, the world population could reach up to 8.5 billion by 2030. By 2030, urban areas are expected to house approximately 60% of the global population, and due to global population growth, demands for water, energy, and food are predicted to increase by approximately 35%, 40%, and 50%, respectively (UN, 2018, 2022; National Intelligence Council, 2012). In addition, although global food production strives to keep up with this rapid population growth and demand, it is known that nearly 750 million people, making up approximately 10% of the global population, were exposed to severe food insecurity in 2023 (FAO, 2024). Given the various global challenges faced today and the pressure these challenges place on natural resources, it is inevitable that this rate will rapidly increase over the years. Therefore, it should be understood that food systems cannot be addressed in isolation when responding to the food demand of the current and future population, and they must be integrated into a holistic planning process together with water and energy resources. Ringler and others support this view, arguing that resources and their usage are interconnected in terms of environmental outcomes for present and future generations, and that a rigorous theoretical framework is necessary to balance the costs of trade-offs and identify synergies to ensure sustainability (Ringler et al., 2013). Considering the natural resources that food systems are directly or indirectly connected with, the Water, Energy and Food Security Nexus concept/approach (WEF Nexus) corresponds to this theoretical framework. Therefore, the primary objective of this study is to qualitatively and quantitatively assess the sustainability of the urban food systems in terms of the level of integration among water, energy, and food components. This assessment is conducted through a systematic review, content analysis, and comparative analysis of the planning and policy decisions found in the plans prepared or commissioned by the local governments of Istanbul, Ankara, and Izmir—Türkiye's three largest metropolitan cities—using the MAXQDA 2024 software. In this regard, the study focuses respectively on the sustainability of food systems, the WEF Nexus, the relationship this approach establishes with sustainability, and finally the sustainability of food systems in the context of the WEF Nexus approach. Because this approach is recognized in the literature for explaining the connections between water, energy, and food components, aiming to optimize these components, and contributing to the sustainability of food systems. Additionally, it is regarded as a tool that optimizes the resource use of society and cities, and consequently, food systems.

Additionally the WEF Nexus approach has generally been a subject of study in the fields of engineering, economics, environmental sciences, and policy in the literature. These studies have addressed factors such as the design of systems, the use of innovative technologies, the standardization of economic investments, and the analysis of costs (Rasul, 2014; Bazilian et al., 2011; Smajgl & Ward, 2013; Hoff, 2011; Simpson & Jewitt, 2019; Ali & Acquaye, 2024). When examining plans at various scales, it becomes apparent that there are deficiencies in the visions of establishing intersectoral relationships and serving a network-connected planning approach for the future. The fragmentation of planning decisions and policies between sectors, along with the lack of integrated governance, leads to undesirable outcomes in terms of sustainability (Weitz et al., 2017; Childers et al., 2015). Despite the growing awareness in recent times, the integrated design and implementation of WEF components (water, energy, food) in planning processes, which have not yet been adequately addressed, also bring important legal and administrative issues to the forefront (Olawuyi, 2020). In other words, the lack of effective incorporation of the WEF Nexus approach into policy agendas from legal and administrative perspectives creates a significant gap between science and policy, affecting the sustainability of food systems.

While the WEF Nexus approach has been previously applied to food system planning, this study represents the first attempt in Türkiye to 'urbanize' and 'systematize' the concept, specifically within the context of food systems. It does so by examining the governance tools and power dynamics that shape interactions between water, energy, and food components in urban areas. Therefore, the findings of the study, derived from Türkiye's three largest metropolitan cities, are expected to shed light on the key points of convergence and divergence between sustainable food system goals and the criteria based on the WEF Nexus approach for policymakers and researchers.

Sustainable Food Systems

According to the literature, systems theory addresses the interactions between components aimed at maintaining the stability and integrity of a system in the face of various externalities, the problems arising from these interactions, and the effective management of resources (Eakin et al., 2017; Ericksen, 2008).

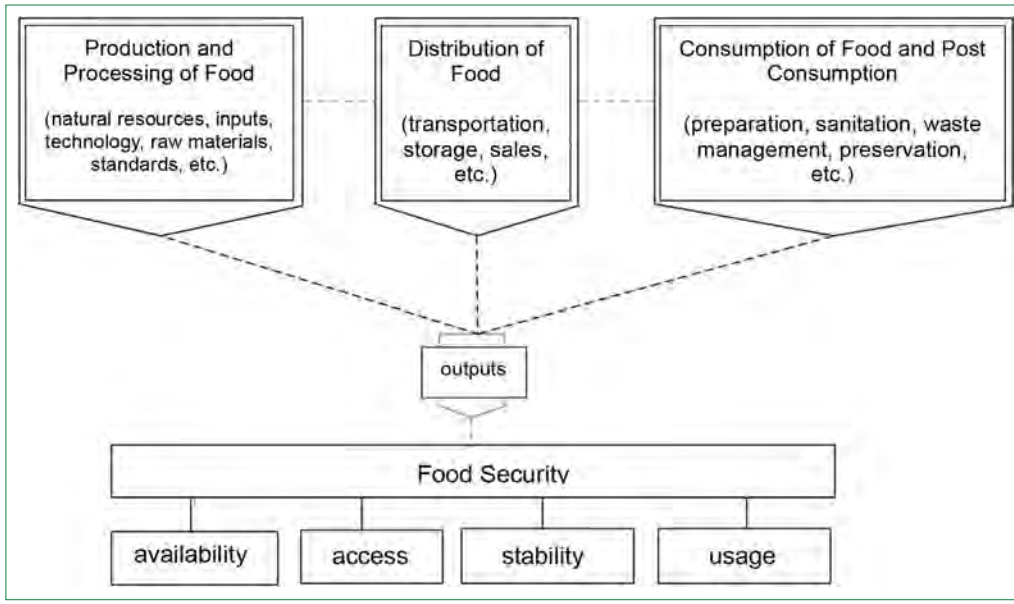

Figure 1. Processes and steps in food systems (Ericksen, 2018; FAO, 2014).

Food systems are considered to be complex and heterogeneous systems that integrate social, environmental, and economic processes extending from production to consumption in order to meet vital needs (Ericksen, 2008; Sobal et al., 1998; Bilali et al., 2021). The discussion of the sustainability of these systems, which face the challenge or necessity of providing safe, adequate, and healthy food and encompass many processes, has gained importance in recent years among experts from different disciplines (Béné et al., 2019; Kneen, 1993; Chopra et al., 2005). It can be said that food systems, which are responsible for the vital continuity of the rapidly growing global population, face various challenges that require structural changes in order to become sustainable (Weber et al., 2020).

Making food systems sustainable and optimizing them are directly affected by how the supply-demand balance among various natural resources is established. Karan and others indicate that decisions related to meeting the food demands of the population directly impact water and energy demand (Karan et al., 2018). In this context, within the framework of systems theory and food systems sustainability, achieving an optimal balance in food systems depends directly on maintaining a well-regulated supply-demand relationship between water and energy components. Therefore, in policy or planning decisions aimed at ensuring the sustainability of food systems, it is necessary to consider the pressure and demand created on other natural resources and cities.

According to Eriksen and the Food and Agriculture Organization of the United Nations (FAO) report, food systems include three fundamental processes and various steps (Ericksen, 2008; FAO, 2014). These fundamental processes and their corresponding steps are illustrated in Figure 1.

As can be seen in Figure 1, food systems have three fundamental processes: food production, food distribution, and food consumption. These processes involve various steps and inputs.

Firstly, in the food production and processing stage, there is a need for various natural resource inputs, the use of technology, the procurement and preparation of raw materials, and the establishment of standards. In the food distribution process, steps include transportation and logistics, the safe and secure storage of food, and the execution of sales. Finally, in the food consumption and post-consumption stages, various steps such as preparation for consumption, sanitation processes, waste management, and storage are involved. If optimization of these processes and the steps within them can be achieved, food security can be ensured. This allows for sustainable responses to the demands of both current and future populations at the fundamental components of food security: "availability," "access," "stability," and "utilization" (Ericksen, 2008; FAO, 2014).

Therefore, the sustainability of food systems is essentially dependent on natural resources; this dependence and reliance inevitably lead to various impacts on the fundamental processes of food systems like production, processing, transportation, and retail (Béné et al., 2019). These impacts can threaten the availability of natural resources and the right/need of future populations to access food. This is because it is known that food systems account for approximately 34% of total greenhouse gas emissions, about 30–35% of global energy consumption, and about 70% of global water use, stemming from land use, storage, transportation, packaging, processing, retail, and consumption (International Food Policy Research Institute, 2022). In other words, the sustainability of food systems and their processes is in a bidirectional

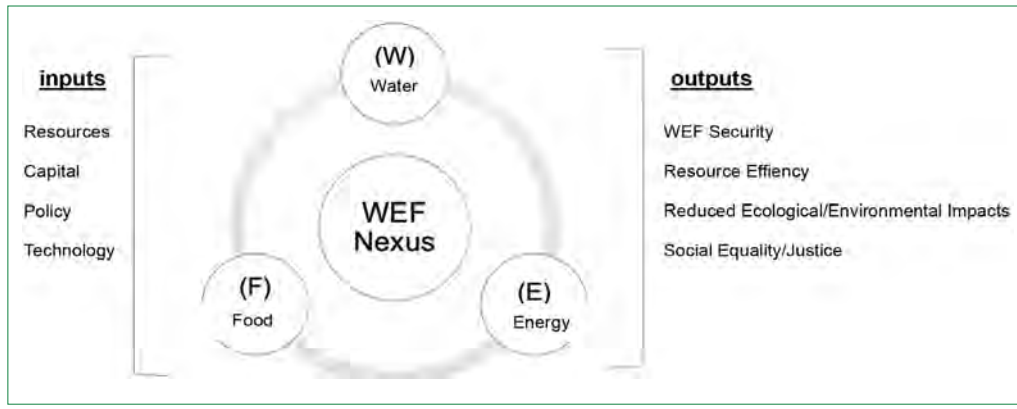

Figure 2. Bonn 2011 Nexus framework (Hoff, 2011).

relationship with unsustainable resources. Singh and Tayal state that one of the biggest barriers to urban policy efforts is the difficulty in understanding the holistic resource issues and interconnections within the food system (Singh & Tayal, 2022). From this perspective, understanding that the sustainability of food systems is directly related to other resources is crucial. It is necessary to approach the sustainability of this heterogeneous system, which is both directly affected by and has the potential to directly affect these resources, from the "Nexus" perspective. Because the fundamental purpose of the Nexus approach is to draw attention to three essential resources—water, energy, and food—that are at risk due to environmental changes and human interventions. The relationship among these resources is crucial for the survival of both humans and the biosphere (Farmandeh et al., 2024).

WEF Nexus Approach

The term "Nexus," derived from Latin meaning "to connect," generally refers to the concept of examining the interrelationships between two or more things (De Laurentiis et al., 2016). The WEF Nexus approach, aimed at ensuring water, energy, and food security for current and future populations, has particularly gained momentum in recent years. It focuses on enhancing inter-resource synergies and providing integrated governance for water, energy, and food security (Srigiri & Dombrowsky, 2021; Hoff, 2011). In this context, it can be stated that examining the mutual interconnections between water, energy, and food components forms the core idea of this approach (Orimoloye, 2022). Some of the main reasons for the increasing interest and importance in this approach in recent years are its multi-centric nature and the equal consideration of each sector within the approach's context (Simpson & Jewitt, 2019). In this context, the balance of supply and demand for water, energy, and food components is established, and any planning decisions made for one resource that could threaten the sustainability of the other two resources are prevented.

According to the literature, the emergence of this concept is known to be based on the increasing issues of water scarcity and insecurity that arose with the 2007–2008 food and energy crisis (Estoque, 2022; Chirisa & Bandauko, 2015). Additionally, this inter-resource connection and relationship was first brought to attention with the landmark report titled "Water Security: The Water-Food-Energy-Climate Nexus," published during the World Economic Forum in 2011 (World Economic Forum, 2011). In this forum, it was discussed that water security is a global concern and creates threats/opportunities for the business world, and solutions for the efficient use of resources were discussed (Pahl-Wostl , 2019). The Bonn 2011 Nexus Conference, organized by the German government in 2011, is considered a significant initial step in the development of the core concept and approach of the WEF Nexus (Leck et al., 2015). During the Bonn Conference in 2011, the term "Nexus" was coined for this relational situation supporting sustainability and sustainable development, through the background document titled "Understanding the Nexus," prepared by Hoff (Hoff, 2011). At the conference, the term "Nexus" was described as a network-focused approach necessary for addressing unsustainable growth patterns and emerging resource insecurities, while enhancing access security to essential services (Bonn 2011 Nexus Conference, 2011). In addition to the World Economic Forum and the Bonn Conference, which played significant roles in the emergence of this approach in 2011, organizations such as the World Water Forum, Planet Under Pressure, Future Earth, Rio+20, Nexus 2014, and Stockholm Water Week, held in 2012 and 2014, also played crucial roles in shaping the approach (Al-Saidi & Elagib, 2017). To summarize, following the food and energy crises of 2007 and 2008, this concept gained momentum particularly in the business world. With the World Economic Forum and the Bonn Conference in 2011, it took shape as the WEF Nexus approach. Today, it is seen as a managerial understanding necessary for the sustainability of all urban systems and systems in general.

Figure 2 shows the Nexus framework from the background document titled "Understanding the Nexus," presented by Hoff (2011) during the Bonn Conference in 2011, which was instrumental in the emergence of the WEF Nexus approach.

According to the framework in Figure 2, the WEF Nexus approach involves various inputs and outputs. Factors such as resources, capital, policies, and technology constitute the "inputs," while the outcome of a system addressing water, energy, and food components through this approach results in ensuring resource security, increasing resource efficiency, reducing environmental/ecological impacts, and promoting social justice/equality. In other words, the WEF Nexus supports integrated and sustainable resource planning and management, and optimizes resource use to ensure fundamental and universal rights related to water, energy, and food security (Kurian, 2017; World Economic Forum, 2011).

To anticipate potential risks of future resource insecurity and protect against them, this approach, which addresses key issues in food, water, and energy components through a sustainability lens, focuses on the security of the three resources. It offers simultaneous global assessment solutions for developing and implementing different approaches (Salem et al., 2022; Biggs et al., 2015). In this context, it is possible to state that the approach provides a common foundation for researchers, policymakers, practitioners, and stakeholders in managing the production, use, and security of water-energy-food systems in an interconnected manner (Cai et al., 2018).

Additionally, it has been determined that 2.2 billion people worldwide lack access to safe drinking water, approximately 789 million people were without electricity in 2018, and about 25.9% of the global population was affected by moderate to severe food insecurity in 2019 (Carmona-Moreno et al., 2021). In its 2012 report, the United States National Intelligence Council identified the WEF Nexus approach as one of four mega-trends for 2030. It highlighted that due to global population growth, demands for water, energy, and food are expected to increase by approximately 35%, 40%, and 50%, respectively. The report emphasized that policymakers and stakeholders need to be proactive to avoid resource constraints (National Intelligence Council, 2012). The European Union's (EU) 2011–2012 Development Report focused on water, energy, and land issues, and examined the importance of integrating these resources in promoting sustainable development (EU, 2012). In other words, the increase in shortages of water and food resources, along with supply crises and failures of fragmented management strategies, are considered driving forces behind the emergence of this approach. The approach aims to create synergies between water, energy, and food to ensure resource efficiency and sustainability as a solution to climate change and resource scarcity caused by various factors (Al-Saidi & Elagib, 2017; Conway et al., 2015).

In the context of the approach, the interconnections and relationships between sectors are paramount. Simply put, water is needed to produce energy, energy is needed to supply water, food is needed to produce energy, and energy is needed to produce food. Considering these interconnections can enhance mutual benefits and minimize negative impacts on the sectors (Bielicki et al., 2019; Stringer et al., 2014). Understanding the interactions between the components of the WEF Nexus approach and addressing policy decisions while balancing costs can enhance the efficient use of resources and ensure resource security (Hoff, 2011; World Economic Forum, 2011). Because most resource management policies in many countries remain sectoral and fragmented, they lead to various medium- and long-term challenges on a global scale in the process of resource management and climate change adaptation (de Andrade Guerra et al., 2021). In other words, the WEF Nexus approach (water-energy-food connection), which promotes synergistic integration between sectors, aims to reduce global risks by avoiding the negative externalities of treating each sector in isolation and focuses on increasing efficiency by optimizing resources.

The Relationship between WEF Nexus and Sustainability

The fulfilment of essential human activities is related to the sustainability of water, energy, and food systems (Biggs et al., 2015). These resources and systems, while having various activity areas and processes, can create both positive and negative effects on each other. For example, according to the FAO's 2018 report, about one-third of the food produced in food supply and consumption processes is lost, which accounts for 20% of freshwater and 38% of energy consumption (FAO, 2018). By 2030, it is estimated that there will be a 40% water deficit in meeting global drinking water demand, food, and energy needs (Bizikova et al., 2013). In this context, considering the interconnections between systems and the loss of natural resources resulting from these interconnections, it is possible to state that vital issues such as food security, nutrition, and sustainability are under threat in the future. As a result, there is a need to focus on ensuring the "safety" of sustainability and examining the positive and negative impacts of the resources or systems discussed within the approach (Simpson & Jewitt, 2019). Additionally, sustainability is directly connected to the concept of "security," but it is not solely related to the existence or availability of resources; it also requires focusing on ensuring universal access and distributive justice (Biggs et al., 2015; Leese & Meisch, 2015). In this context, the WEF Nexus approach is an approach that aims to focus on resource security and equal/fair distribution of resources, and it directly contributes to sustainability. This approach, which explains the interdependencies or dependencies between these resources or systems, can also significantly affect future urban growth (Kurian & Ardakanian, 2015). Additionally, it is suggested that integrating water, energy, and food within a "nexus" framework is a necessary path to achieving a holistic sustainability vision that aims to balance the various goals, interests, and needs of people and the envi-

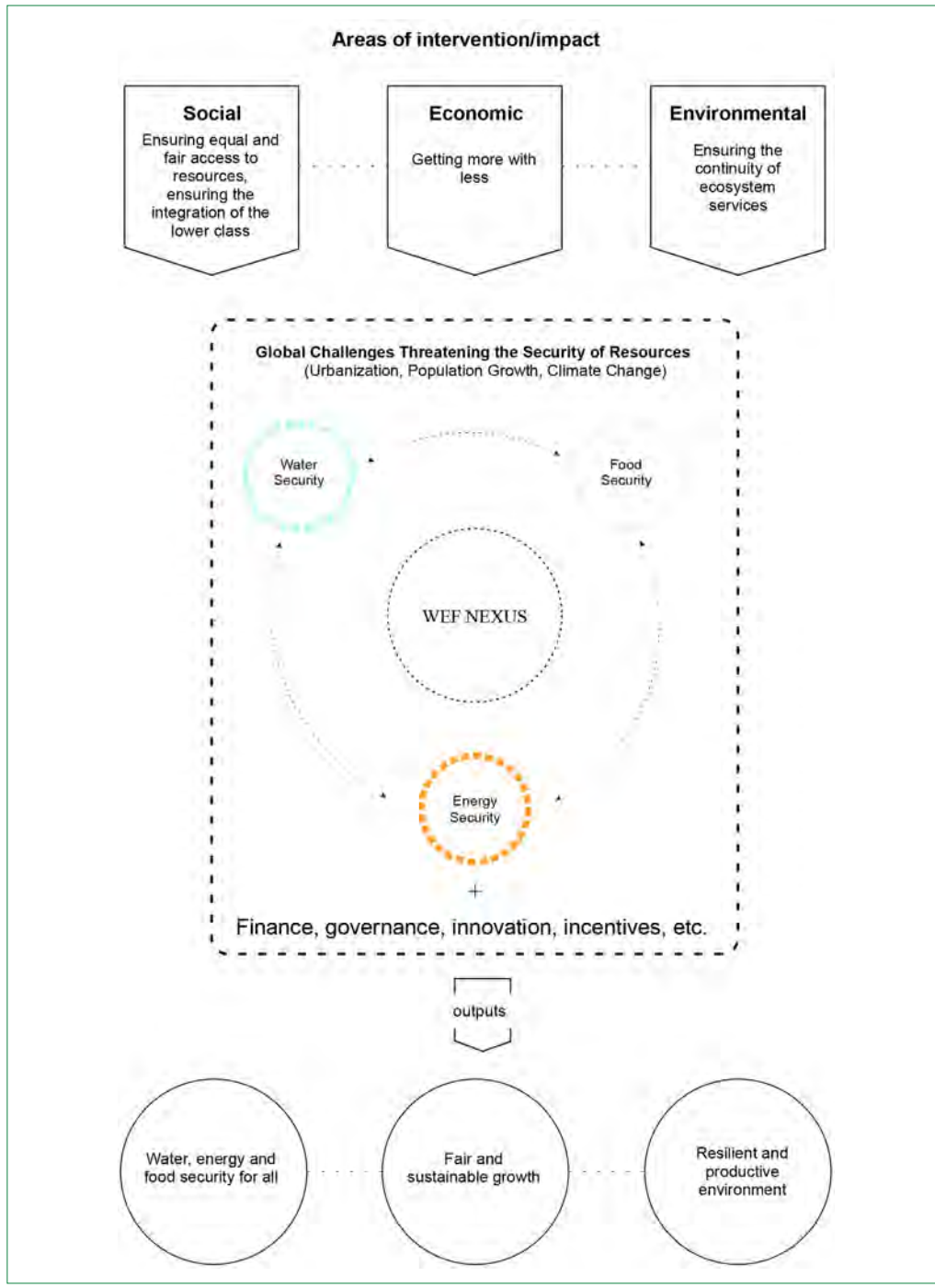

Figure 3. Outcomes of the approach that contribute to the sustainability vision (Hoss, 2011).

ronment (Salam et al., 2017; Chang et al., 2016). According to Hoff (2011), a key figure in conceptualizing the approach, the outputs and conceptual expression of the approach that contribute to the sustainability vision are illustrated in Figure 3.

When examining the expression shown in Figure 3, global challenges such as urbanization, population growth, and climate change are first identified. As a result of these challenges and various constraints, the components of water, energy, and food, which are under threat to sustainability, are integrated within the WEF Nexus approach. This framework defines the security of these resources and their interrelationships. Subsequently, intervention areas necessary for ensuring the fundamental concept of sustainability—"resource security"—are identified and classified into social, economic, and environmental categories.

Table 1. The level of relevance of WEF (water, energy, food) components to the sustainable development goals (Rockström & Sukhdev, 2016; Bhaduri, et al., 2016; United Nations, 2015)

	Sustainable development goals																
	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
	No poverty	Zero hunger	Good health and well-being	Quality education	Gender equality	Clean water and sanitation	Affordable and clean energy	Decent work and economic growth	Industry, innovation, and infrastructure	Reduced inequalities	Sustainable cities and communities	Responsible consumption and production	Climate action	Life below water	Life on land	Peace, justice, and strong institutions	Partnerships for the goals
W (water)	●●	●●	●●	●	●	●●●	●●	●●	●	●	●●	●●	●●	●●	●●	●	●
E (energy)	●●	●●	●●	●	●	●●	●●●	●●	●●	●	●●	●●	●●	●●	●●	●	●
F (food)	●●	●●●	●●	●	●	●●	●●	●●	●	●	●●	●●	●●	●●	●●	●	●

Evaluating these intervention areas, the need to ensure equitable and fair access to resources for the population at the base of the societal pyramid emerges. Secondly, from an economic perspective, the ability to achieve more output with fewer inputs is highlighted to increase efficiency. Lastly, it is noted that various investments are required to ensure the sustainability of ecosystem services and the protection of resources. Summarizing these three intervention areas within the scope of sustainability: ensuring equitable/fair access to resources, protecting the natural environment and resources to secure ecosystem continuity, and implementing practices that achieve economic efficiency all require referencing concepts such as finance, management, and innovation. Finally, Figure 3 shows that managing resource security equitably/fairly in these three intervention areas and with the required concepts of finance, management, and innovation will contribute to sustainable growth.

Additionally, this approach advocates for an integrated system with specified interrelationships, rather than an independent and isolated system. It also plays a significant role in achieving the Sustainable Development Goals (Wang et al., 2021). Although the Sustainable Development Goals refer to many policy areas, the interconnections and indirect relationships between the goals are often weak. For example, the lack of clear specification of the interconnections between food security goals and the water and energy sectors is indicative of this issue (Boas et al., 2016). However, interconnections between sectoral goals are quite important; it is known that a policy decision in one sector can lead to inconsistencies in policy goals in another area (Howells et al., 2013). In this context, a comprehensive approach to fundamental planning principles, management, evaluation, and implementation is required to overcome various challenges related to sustainability (Estoque, 2022). Therefore, it is important to understand the interactions between the Sustainable Development Goals and to assess them from the "Nexus" perspective, which has been widely supported over the past decade as a framework that promotes the coordinated implementation of these goals (Olawuyi, 2020). This is because all the Sustainable Development Goals are interconnected or dependent on each other directly or indirectly; the WEF Nexus plays a crucial role in achieving these goals in a holistic manner (Saladini et al., 2018; Biggs et al., 2015). Salem and others argue that this approach represents a holistic sustainability vision that addresses long-term sustainability challenges by protecting natural, human, and social capital, and promotes sustainable development by conserving natural resources and the environment (Salem et al., 2022). In this regard, this approach and vision provide a systematic perspective to overcome the pressures that global risks place on resources and require effective management to achieve the UN Sustainable Development Goals (de Andrade Guerra et al., 2021; Hoff, 2011).

When evaluating the Sustainable Development Goals in relation to the components addressed by the WEF Nexus approach, Sustainable Development Goal 2 (zero hunger), Sustainable Development Goal 6 (clean water and sanitation), and Sustainable Development Goal 7 (affordable and clean energy) are directly related to food, water, and energy secu-

rity, respectively (UN, 2015). The approach also establishes indirect connections with all other goals, as all Sustainable Development Goals are interconnected in various ways, similar to the interrelationships among food, water, and energy systems. However, there is still no consensus on a framework that encompasses all Sustainable Development Goals. Nevertheless, it is argued that integrating water, energy, and food within a nexus framework can be considered a necessary path to achieving the Sustainable Development Goals (Estoque, 2022; Salam et al., 2017). In this regard, Table 1 presents the levels of direct or indirect relationships between the components of the WEF Nexus approach—water, energy, and food—and all Sustainable Development Goals.

As stated in Table 1, the goals directly related to the components of the WEF Nexus approach—water, energy, and food—are Sustainable Development Goal 2, Sustainable Development Goal 6, Sustainable Development Goal 7, Sustainable Development Goal 14, and Sustainable Development Goal 15. For instance, when examining the water component specifically, it is seen to be directly and fundamentally related to Sustainable Development Goal 6, but also to have interconnections and overlaps with all other goals. In other words, failing to achieve water-related goals increases the risk of not achieving other interconnected goals (Bhaduri et al., 2016). In other words, achieving Sustainable Development Goal 6 will significantly contribute to achieving Sustainable Development Goal 14, titled "Life Below Water," and Sustainable Development Goal 15, titled "Life on Land." Conversely, failing to achieve Sustainable Development Goal 6 will negatively impact all interconnected Sustainable Development Goals (Bhaduri et al., 2016).

Therefore, analyzing the complex relationships within the water-energy-food nexus is critical for ensuring sustainability at national, regional, and urban levels. Establishing a balance between the direct and indirect relationships among the components will help create resilient urban areas against resource limitations and inequities in access.

Sustainable Food Systems in the Context of the WEF Nexus

According to a 2014 report by FAO, it is expected that by 2050, the global population will require more than 60% additional food to meet the rising demand (FAO, 2014). According to a 2021 report by the UN, approximately 760 million people (10% of the population) experienced food insecurity in 2019, and this number increased with the impact of COVID-19 starting in 2020 (UN, 2021). In addition, there are many adverse global externalities today that have the potential to significantly impact these projections, such as urbanization, population growth, political instability, pandemics, natural disasters, wars, and climate change. These factors jeopardize the sustainability and security of food systems and necessitate major transformations in management or governance systems (Hassen et al., 2025; Daher et al., 2021). This is because it is known that the destructive effects of economic growth, globalization, or urbanization have a negative impact on ecosystems, dietary patterns, and the availability of resources (De Laurentiis et al., 2016). In the context of the WEF Nexus approach, the negative trend towards the unsustainability of all resources makes the concept of "security" crucial in food systems.

Firstly, the concept of food security generally emphasizes ending hunger worldwide (Pahl-Wostl, 2019). This concept was first expressed at the World Food Summit in 1996 as "the state of people's physical, economic and social access to healthy, sufficient and safe food that meets their body needs to be productive and have a sane lifestyle" (FAO, 1996). Ericksen defines food security as a dynamic situation resulting from the interaction of multiple factors or components (Ericksen, 2008). In addition, FAO also states that food security has four basic dimensions: availability, access, stability and utilization; and adopts an integrated management framework/approach in order to ensure balance between these dimensions (FAO, 2014). The integrated approach adopted and emphasized by FAO is the WEF Nexus (water-energy-food nexus) approach. This is because the approach takes into account the impact of water and energy resources on food security and the sustainability of food systems. Considering the effects of water, energy, and food on each other and the interrelationship among these resources, the WEF Nexus approach is crucial for ensuring food security and achieving the four specified dimensions. Furthermore, FAO states that the adoption of the WEF Nexus approach is based on a vision of "sustainability," and that ensuring the sustainability of resources is essential for achieving and maintaining the dimensions of food security (Pahl-Wostl, 2019; FAO, 2014). The four dimensions or components defined by FAO for achieving food security—"food availability," "food access," "food stability," and "food utilization"—along with other interacting sub-components, are shown in Figure 4.

According to Figure 4, the first fundamental dimension of food security, "food availability," is addressed along with four sub-components. These sub-components collectively contribute to the availability of food in terms of both quantity and quality and are categorized as "production," "consumption," "import," and "export." The other fundamental dimension, "food access," is influenced by resources, resource management, infrastructure, and transportation factors. Additionally, the level of "access" to food is determined by how well people can convert their various financial, political, and other assets into food, making it closely related to inequalities in food availability and distribution (Ericksen, 2008). Thus, these fundamental dimensions and sub-components encompass the necessary policy and physical processes for ensuring that

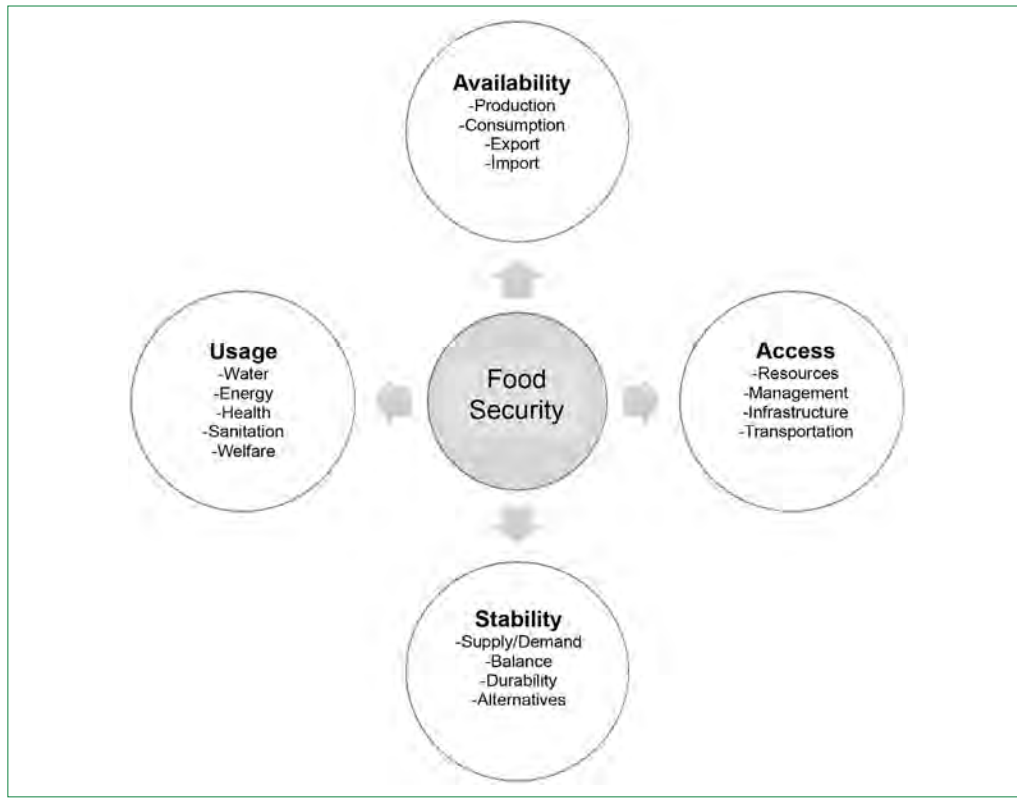

Figure 4. Dimensions and compenents of food security (FAO, 2014).

both current and future populations have access to secure food. The third fundamental dimension, "stability," plays a crucial role in maintaining stability while meeting food supply and demand, enhancing the resilience of food systems, and increasing alternatives. The final fundamental dimension, "utilization," focuses on preventing developments that could jeopardize the sustainability of the resources addressed within the WEF Nexus approach. In this phase, the primary goal is to ensure that all segments of the population have access to safe and healthy food by minimizing or optimizing the amounts of water and energy required in food systems.

On the other hand, when considering food security dimensions and sustainable food systems within the context of the WEF Nexus approach, the literature provides fundamental solutions for balancing food demand sustainably and ensuring universal access to food. These solutions include "using sustainable and clean methods in production stages," "enhancing education/awareness to promote changes in dietary patterns", and "reducing waste" (De Laurentiis et al., 2016; Dogliotti et al., 2014; Godfray et al., 2010; Herrera-Franco et al., 2024). In light of these recommendations, it can be stated that the primary goal is to optimize inputs and resource use within food systems, and that the WEF Nexus approach can support this objective through policies and regulations that enhance efficiency and infrastructure resilience (De Laurentiis et al., 2016; Hogeboom et al., 2021; Romero-Lankao et al., 2018).

Additionally, it is well known that food waste and losses at various stages of food systems have a significant environmental impact. This issue was highlighted in a study prepared by FAO, which documented the environmental damage caused by waste in food system processes. The study noted that reducing food waste would significantly decrease the need to increase food production by 60% to meet the food demand of the population in 2050 (FAO, 2013). Kummu and others have addressed this environmental damage and negative impacts, noting that approximately one-quarter of the food produced is lost in food supply chains (Kummu et al., 2012). Additionally, when considered within the context of the WEF Nexus approach, it has been found that food waste also impacts other limited resources. The production of wasted food crops constitutes approximately 24% of the total freshwater used in crop production, and about 23% of the total global cultivated land area and global fertilizer use (Kummu et al., 2012). It is inevitable that these results will have negative consequences on the natural environment and resources, endangering the sustainability of food systems and food security.

Finally, when considering the sustainability of food systems in the context of the Sustainable Development Goals, the UN's 2030 Sustainable Development Goals are directly or indirectly related to global food systems and their performance. It is known that these goals, while global in scope, also require adaptation efforts at national, regional, and local levels (Chaud-

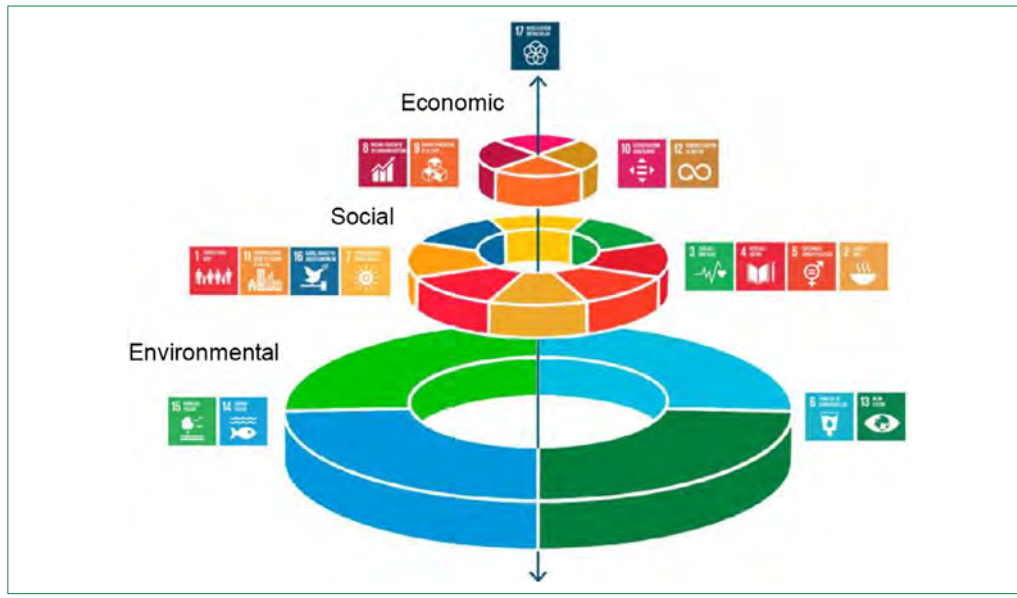

Figure 5. The connection between the sustainable development goals (SDGs) and food (Rockström & Sukhdev, 2016).

hary et al., 2018; Kanter et al., 2016; UN, 2015). The UN also emphasized the critical role of food systems in achieving the Sustainable Development Goals by 2030, at the Food Systems Summit (UNFSS) in September 2021, emphasizing the transition to a "system" view encompassing all processes in food systems (International Food Policy Research Institute, 2022). Rockström and Sukhdev also defended this idea and stated that the role of food systems should be taken into consideration in achieving the Sustainable Development Goals and meeting the requirements of these goals, and that all Sustainable Development Goals are interrelated and directly or indirectly affect food systems (Rockström & Sukhdev, 2016). Figure 5 shows that all Sustainable Development Goals are directly or indirectly linked to food and food systems.

As seen in Figure 5, achieving sustainability requires the advancement of economic, social, and environmental development, with these three dimensions being interconnected. At the EAT Food Forum, Johan Rockström and Pavav Sukhdev offered a new perspective on the economic, social, and environmental aspects of the Sustainable Development Goals, stating that all Sustainable Development Goals are directly or indirectly linked to sustainable and secure food (Rockström & Sukhdev, 2016). Considering that food systems are complex and heterogeneous systems integrating social, environmental, and economic processes from production to consumption, according to Ericksen, it is inevitable that all Sustainable Development Goals serving these three dimensions are related to food systems and the processes they encompass (Ericksen, 2008).

In summary, as indicated in Figure 3, which outlines the outputs contributing to the vision of sustainability, the WEF Nexus approach affects the dimensions of sustainability: social, environmental, and economic processes. Additionally, as shown in Table 1, which explains the direct or indirect relationships between the WEF Nexus components of water, energy, and food with all Sustainable Development Goals, and Figure 5, which states that all Sustainable Development Goals are connected to food, it is argued that the WEF Nexus approach can be considered a necessary pathway for achieving the Sustainable Development Goals and the sustainability of food systems (Estoque, 2022; Salam et al., 2017; Ericksen, 2008).

Methodology

Istanbul, Ankara, and Izmir, Türkiye's three largest metropolitan cities located in the Marmara, Central Anatolia, and Aegean regions, respectively, have distinct yet interconnected food systems shaped by their geographic, economic, and demographic characteristics. Türkiye's economic hub, Istanbul, possesses a highly complex and dynamic food system, whereas the capital, Ankara, serves as a crucial center for grain, meat, and dairy production due to its proximity to the country's central agricultural regions. Meanwhile, Izmir has a food system closely linked to agricultural and marine resources (Izmir Metropolitan Municipality, 2019; AMM, 2019; IMM, 2020).

In this study, Istanbul, Ankara, and Izmir have been selected to evaluate and analyze policy decisions within the WEF Nexus framework, focusing on their impact on local food systems. The analyzed resources, prepared or commissioned by local governments, are listed in Table 2.

The study examines strategies, objectives, actions, and sub-actions influencing food system processes—production, distribution, consumption, and post-consumption—across the finalized plans listed above (Table 2). These plans prepared for urban sustainability, were evaluated within the WEF Nexus framework.

Table 2. Cities and resources to be evaluated in the study

Cities	No	Resources	
Istanbul	1	Istanbul Regional Plan (2014–2023)	(Istanbul Development Agency, 2014)
	2	IMM Strategic Plan (2020–2024)	(IMM, 2020)
	3	ISKI Strategic Plan (2021–2025)	(ISKI, 2020)
	4	Istanbul Climate Change Action Plan	(IMM, 2021a)
	5	Istanbul Sustainable Urban Mobility Plan	(ARUP, 2022)
	6	Local Equality Action Plan (2021–2024)	(IMM, 2021b)
Ankara	7	Ankara Regional Plan (2014–2023)	(Ankara Development Agency, 2015)
	8	Ankara Strategic Plan (2020–2024)	(AMM, 2019)
	9	ASKİ Strategic Plan (2020–2024)	(ASKI, 2019)
	10	Ankara Province Local Climate Change Action Plan	(AMM, 2022)
	11	Local Equality Action Plan (2021–2024)	(AMM, 2021)
Izmir	12	Izmir Regional Plan (2014–2023)	(IZKA, 2015)
	13	Izmir BB Strategic Plan (2020–2024)	(Izmir Metropolitan Municipality, 2019)
	14	IZSU Strategic Plan (2020–2024)	(IZSU, 2019)
	15	Izmir Sustainable Energy and Climate Action Plan - Izmir Green City Action Plan	(Izmir Metropolitan Municipality, 2020a)
	16	Izmir Sustainable Urban Logistics Plan (2030)	(Izmir Metropolitan Municipality, 2020b)
	17	Local Equality Action Plan (2022–2024)	(Izmir Metropolitan Municipality, 2022)

Within the framework of the WEF Nexus approach and its components (water, energy, and food), a systematic review of the 17 selected plans was conducted using MAXQDA 2024 software in accordance with the key reference concepts identified in Table 3. As a result of the review conducted based on the key reference concepts identified within the framework of the literature, key objectives, strategies, actions, or sub-actions addressing food systems and their various processes were identified. In other words, the study is confined to policy decisions specifically related to WEF components that have the potential to influence food systems and processes. Within this scope, plans prepared or commissioned by local governments were analyzed in accordance with Table 3, where the reference concepts were identified within the framework of the literature in the context of the WEF Nexus approach and specifically for food systems. The purpose of identifying these key concepts/domains in Table 3 is to categorize and analyze the strategies, objectives, goals, actions, and sub-actions related to food systems in the plans. Based on these findings, both quantitative and qualitative analyses were conducted for the three selected cities.

According to Table 3, the key common concepts referenced in the analysis of policy/plan decisions related to the components of water (W), energy (E), and food (F) that have direct or indirect effects on the processes within food systems include waste management, climate change, clean production, technology/innovation, resilient infrastructure, fundamental planning principles (inter-plan coherence, transparency, intersectoral coordination), air quality, quality of educational curricula, awareness, and disaster management.

Additionally, in the analysis of policy and plan decisions related to the water (W) component, other concepts such as biodiversity, sensitive ecological areas, wastewater management processes (recycling, reuse, and chemical disposal) also emerged.

For the energy (E) component, the concepts analyzed include transportation connections, logistics, and information/communication technology (ICT).

Lastly, in the analysis of policy decisions related to the food (F) component, concepts not shared with the three components include biodiversity, sensitive ecological areas, transportation connections, logistics, ICT, organic waste management, organic fertilizers, rural development, food management, food security, and sustainable consumption.

In summary, the strategies, objectives, actions, or sub-actions that influence various processes within the food systems (production, distribution, consumption/post-consumption) in Istanbul, Ankara, and Izmir, and primarily aim for sustainability, have been systematically reviewed via MAXQDA 2024 based on the different scales of plans presented in Table 1, within the context of the WEF Nexus approach and its components.

Table 3. Key concepts/areas referenced in the analysis of policy decisions related to WEF components effective in food systems processes

	WEF nexus components			
	W (water)	**E (energy)**	**F (food)**	**References from literature**
Key concepts related to components	Waste management	Waste management	Waste management	(De Laurentiis, Hunt, & Rogers, 2016; Kummu, et al., 2012)
	Climate change	Climate change	Climate change	(Goodarzi, Mohtar, Piryaei, Fatehifar, & Niazkar, 2022; Al-Saidi & Elagib, 2017; Conway, et al., 2015; Hassen, Bilali, Daher, & Burkart, 2025)
	Clean production	Clean production	Clean production	(Herrera-Franco, Bravo-Montero, Caicedo-Potosí, & Carrión-Mero, 2024)
	Technology, innovation	Technology, innovation	Technology, innovation	(Hoff, 2011; Karnib & Alameh, 2020; Kurian, 2017)
	Resilient infrastructures	Resilient infrastructures	Resilient infrastructures	(Hogeboom, et al., 2021; Romero-Lankao, Bruns, & Wiegleb, 2018)
	Basic planning principles	Basic planning principles	Basic planning principles	(Kurian, 2017; Estoque, 2022)
	Air quality	Renewable energy, air quality	Air quality	(Herrera-Franco, Bravo-Montero, Caicedo-Potosí, & Carrión-Mero, 2024)
	Education, awareness	Education, awareness	Education, awareness	(Kurian, 2017; De Laurentiis, Hunt, & Rogers, 2016)
	Disaster management	Disaster management	Disaster management	(Daher, Hamie, Pappas, Karim, & Thomas, 2021; Hassen, Bilali, Daher, & Burkart, 2025)
	Pressure on resources		Pressure on resources	(Hoff, 2011; Salem, Pudza, & Yihdego, 2022)
	Biodiversity, precision ecology		Biodiversity, precision ecology	(Hoff, 2011)
		Logistics, ICT	Logistics, ICT	(FAO, 2014)
	Wastewater management		Organic waste management	(Kurian, 2017)
			Rural development	(FAO, 2024; FAO, 2014)
			Food management	(FAO, 2024; FAO, 2014)

ICT: Information/communication technology.

This systematic review was conducted in accordance with the key concepts and domains identified in Table 3, followed by qualitative and quantitative analyses.

Findings

Table 4 includes the qualitative and quantitative analysis of the relationship between policy decisions effective in food system processes within the plans of the three cities and the WEF components and identified key concepts. The numbers presented in Table 4 indicate the number of policy decisions that are effective in food system processes and are associated with the key concepts identified within the scope of WEF components.

According to Table 4, the relationship between policy decisions affecting food systems and processes and the WEF components and identified key concepts shows some differences across the three cities, both quantitatively and qualitatively.

Firstly, Ankara's plans demonstrate a higher potential for development and alignment in the area of "wastewater management" compared to Istanbul and Izmir. However, in areas such as "waste management", "climate change", "education/awareness", "disaster management," and "logistics/ICT," Ankara lags behind the other two cities. Istanbul and Izmir exhibit similar quantitative tendencies in these aspects. This situation indicates that Ankara needs to develop a more comprehensive sustainability strategy for its food systems. Although Ankara's food system management is strong in terms of wastewater management, there is a need for broader integration in terms of overall sustainability. In particular, deficiencies in education and awareness, disaster management, and logistics processes have the potential to weaken the resilience of the food system (AMM, 2019, 2021, 2022; ASKI, 2019; Ankara Development Agency, 2015). Disaster management and logistics are concepts that must be coor-

Table 4. Qualitative and quantitative analysis of the relationship between planning decisions effective in food systems processes and WEF components and key concepts

WEF nexus components	Key concepts related to components	Cities and the number of policy decisions		
		Istanbul	Ankara	Izmir
W (water)	Waste management	16	4	12
	Climate change	5	1	6
	Wastewater management	13	15	8
	Clean production	3	1	2
	Technology, innovation	8	10	8
	Resilient infrastructures	2	7	8
	Basic planning principles	6	3	6
	Air quality	7	1	2
	Education, awareness	11	2	9
	Pressure on resources	5	6	6
	Disaster management	8	0	5
	Biodiversity, precision ecology	2	1	8
E (energy)	Waste management	9	3	10
	Climate change	3	2	3
	Clean production	2	1	3
	Technology, innovation	7	6	10
	Renewable energy, air quality	7	4	10
	Resilient infrastructures	1	3	3
	Education, awareness	8	2	8
	Basic planning principles	7	4	7
	Logistics, ICT	2	1	13
	Disaster management	6	0	1
F (food)	Waste management	11	4	14
	Climate change	4	3	6
	Clean production	1	1	2
	Technology, innovation	7	7	12
	Resilient infrastructures	1	3	4
	Basic planning principles	6	2	6
	Air quality	7	1	2
	Education, awareness	11	8	9
	Pressure on resources	5	6	4
	Disaster management	5	0	5
	Biodiversity, precision ecology	4	1	7
	Logistics, ICT	2	0	13
	Organic waste management	0	3	0
	Rural development	6	3	3
	Food management	8	5	3

Sources: Authors. ICT: Information/communication technology.

dinated with each other. In addition to the direct impact of disasters on food systems due to the pressure they exert on natural and limited resources, operating in an unstable infrastructure/logistics environment during disasters, combined with a lack of operational knowledge or low awareness, will lead to significant deficiencies, particularly in food supply systems (Kovács & Spens, 2007).

Secondly, Table 4 indicates that Istanbul's plans have a higher potential for development and alignment, quantitatively, in policy decisions related to the water component, particularly in "waste management", and in the areas of "education and awareness", "rural development", and "food management" compared to Ankara and Izmir. However, Istanbul is relatively behind Ankara and Izmir in "resilient infrastructure" across all WEF components, specifically in the area of "logistics/ICT." Istanbul's strengths in food systems may be based on water management and education processes; however, infrastructure deficiencies increase the system's vulnerability. In other words, while Istanbul's food system policies provide advantages in water management and rural development, deficiencies in logistics and resilient infrastructure may lead to vulnerabilities in the food supply chain. To enhance food security, it is essential to focus on infrastructure investments and resilient systems (Istanbul Development Agency, 2014; IMM, 2020, 2021a, 2021b; ISKI, 2020; ARUP, 2022). Infrastructures are the means through which water, energy, and food are transformed or transmitted for urban use, determining the availability and utilization of resources. As they can either mitigate or exacerbate the vulnerability of cities and populations to threats, they represent a fundamental source of dependency, particularly in the context of food systems (Romero-Lankao et al., 2018).

Lastly, as to Izmir, the policy decisions affecting food systems and their processes show a higher potential for development quantitatively in the areas of "waste management," "logistics/ICT" related to energy and water components, "technology/innovation," "biodiversity," "sensitive ecology," and "renewable energy" compared to the other two cities. The focus of these areas is generally on increasing efficiency, conserving resources, and ensuring effective implementation. Considering the impact of all processes in food systems from production to consumption on sustainability, resource efficiency, conservation, and the presence of innovative practices, these factors inevitably contribute to the sustainability of food systems. In other words, Izmir's policy decisions regarding food systems and within the framework of the WEF Nexus approach adopt a more environmentally friendly and innovative perspective by focusing particularly on renewable energy, logistics, and ecological sustainability. Its ability to develop integrated solutions, especially in the areas of renewable energy, sensitive ecology, and logistics, positions it as the strongest city in terms of the WEF Nexus (IZKA, 2015; IZSU, 2019; Izmir Metropolitan Municipality, 2019, 2020a, 2020b, 2022). Considering that most food loss and waste in developing countries stem from inadequate infrastructure, limitations in traditional harvesting techniques, deficiencies in storage and refrigeration technologies, and lack of market access, the ability to develop integrated solutions in renewable energy, precision ecology, and logistics is of critical importance (De Laurentiis et al., 2016).

Conclusion

Today, the food crisis is driven by multiple factors, including climate change, urbanization, poor economic investments, political upheavals, and conflicts. As a result, ensuring sustainable food systems and food security has become a critical priority. However, food systems cannot be addressed in isolation within policy decisions and implementation processes, as they rely on complex interactions across multiple sectors. Their continuity—from production to consumption—depends on the availability of essential natural resources. To effectively address this challenge, the WEF Nexus framework provides a holistic approach, balancing interactions, trade-offs, and resource constraints between water, energy, and food systems. It aims to optimize resource use, manage scarcity sustainably, and develop integrated response strategies across sectors.

This study aims to analyze the impact of the WEF Nexus approach on food system sustainability. Focusing on Istanbul, Ankara, and Izmir—Türkiye's largest metropolitan areas facing significant external challenges—local policy decisions were examined using MAXQDA 2024. Targets, strategies, and actions affecting food systems were systematically reviewed within the WEF Nexus framework (water, energy, and food) and key literature-derived domains. The qualitative and quantitative analyses highlight policy gaps and emphasize the need for integrated governance, offering insights into urban policy deficiencies and planning inefficiencies.

The findings highlight that urban food system sustainability challenges vary significantly across Istanbul, Ankara, and Izmir. In Ankara, it is possible to state that prioritizing issues such as "waste management," "climate change," "education/awareness," "disaster management," and "logistics/IT" in policy-making, planning, or implementation efforts in Ankara's plans is critically important for ensuring the sustainability of food systems and addressing urban sustainability challenges. In this regard, urban planning policies or practices should place more emphasis on sustainable waste management and the creation of necessary infrastructures, clearly address interventions to reduce the impacts of climate change, increase education and awareness efforts, take measures against various disasters that affect the sustainability of WEF components such as water, energy, and food, and develop efficient and effective logistics frameworks.

In the case of Istanbul, it is necessary to give more consideration to the resilience of infrastructures and the logistics framework in the processes of producing or implementing urban planning policies. This is because the components of energy and water have significant impacts on various processes such as food production, processing, and distribution. The advancement, resilience, and overall logistics framework of infrastructures are critical for steps like minimizing environmental impacts, and ensuring the delivery and supply of food through the effective provision and utilization of water and energy.

In the plans determined by local authorities in İzmir that will affect the sustainability of food systems, it is possible to state that there is a focus on increasing resource efficiency in areas such as "waste management," "logistics/IT," and "technology/innovation." However, there are deficiencies in "disaster management" related to the protection of energy and water resources. Overall, it can be expressed that İzmir is showing progress toward a vision that can adapt modern planning approaches to current conditions, compared to the other two cities, in terms of urban policy decisions that could impact food systems and processes.

Overall, this study demonstrates that there is no integrated vision for the water-energy-food relationship in policy decisions shaping food systems across Türkiye's three largest metropolitan areas. Instead, these components are treated in a fragmented manner in urban planning.

To address these issues, local governments should prioritize integrated governance frameworks that align water, energy, and food policies. This includes:

- Establishing multi-sectoral working groups to improve inter-agency coordination,
- Enhancing data-sharing mechanisms between municipalities,
- Implementing adaptive policy strategies that dynamically respond to environmental and economic changes.

Given these findings, urgent action is needed to systematically embed WEF Nexus considerations in urban planning and policy frameworks. Without such efforts, the sustainability and resilience of Türkiye's urban food systems will remain at risk, potentially exacerbating resource shortages and environmental vulnerabilities in the coming decades.

Future research could further investigate the institutional and political factors influencing the degree of WEF Nexus integration in urban planning. Understanding the underlying governance structures and decision-making processes may provide deeper insights into why certain elements are prioritized while others remain overlooked.

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Planlama 2025;Supp(1):35–58 | doi: 10.14744/planlama.2025.27037

ARTICLE / ARAŞTIRMA

Where to Do Urban Agriculture? Spatial Multicriteria Decision Making in Beylikdüzü, Istanbul

Kentsel Tarımı Nerede Yapacağız? Beylikdüzü, İstanbul'da Mekânsal Çok Kriterli Karar Verme

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ABSTRACT

Agricultural activities have evolved beyond supplying fundamental food needs to include economic, social, recreational, and environmental aspects. Urban agriculture has gained importance as the primary application of urban food planning. This study aims to examine how ground level urban agricultural areas will be determined to create a more sustainable, safe, and fair food system at the local level. A spatial multi-criteria analysis was conducted to establish the criteria for site selection, resulting in the identification of ten parameters and twenty sub-criteria. The Analytical Hierarchy Process (AHP), a multiple decision-making (MCE) method, was also used to determine the relative weights of these criteria. Spatial analyses were performed for Beylikdüzü, a district in metropolitan Istanbul, using Geographic Information Systems (GIS). Preliminary findings indicate that distance from pollutant sources is the most crucial factor in urban agricultural area selection. Additionally, the built environment was found to exert a greater influence than social and natural factors. The spatial analysis reveals that if the most suitable urban agricultural areas for Beylikdüzü district are allocated for production, 13% of the district's fresh food needs can be met and 350 tons of CO_2 can be saved annually. These areas are predominantly concentrated in three specific regions. Overall, the findings provide a basis for developing and implementing local food policies.

Keywords: AHP; GIS; local food production; MCE; urban agriculture.

ÖZ

Tarımsal faaliyetler, temel gıda üretiminin ötesine geçerek ekonomik, sosyal, rekreasyonel ve çevresel boyutlar kazanmıştır. Kentsel tarım, özellikle kentsel gıda planlamasında öncelikli uygulama olarak öne çıkmaktadır. Bu çalışma, yerel ölçekte daha sürdürülebilir, güvenli ve adil bir gıda sistemi oluşturmak amacıyla, zemin seviyesi/toprak üstü kentsel tarım alanlarının belirlenmesini incelemektedir. Kentsel tarım alan seçme kriterlerini tanımlamak için mekansal çok kriterli analiz yaklaşımı kullanılmış, 10 parametre ve 20 alt kriter belirlenmiştir. Kriter ağırlıklarını hesaplamak için Çok Kriterli Karar Verme (ÇKKV) yöntemi olan Analitik Hiyerarşi Süreci (AHS) yaklaşımı kullanılmıştır. Coğrafi Bilgi Sistemleri (CBS) aracılığıyla İstanbul/Beylikdüzü ilçesi için mekansal analizler gerçekleştirilmiştir. Ön bulguları, kirletici kaynaklardan uzaklığın kentsel tarım alanı seçiminde en önemli faktör olduğunu ve inşa edilmiş çevrenin alan seçiminde sosyal ve doğal çevrelerden daha etkili olduğunu göstermiştir. Mekansal analiz bulguları ise Beylikdüzü ilçesi için en uygun kentsel tarım alanlarının üretime ayrılması durumunda ilçenin taze gıda ihtiyacının %13'ünün karşılanabileceğini ve yıllık 350 ton CO_2 tasarrufu sağlanabileceğini ortaya koymaktadır. İlçenin potansiyel kentsel tarım alanlarının üç bölgede mekansal olarak yoğunlaştığı görülmektedir. Bulgular, yerel gıda politikaları geliştirmemize ve uygulamamıza olanak sağlamaktadır.

Anahtar sözcükler: AHS; CBS; yerel gıda üretimi; ÇKKV; kentsel tarım.

This article is derived from the master's thesis titled "Urban agriculture site selection in Beylikduzu, İstanbul", authored by Ayşe Burcu Kısacık (first author), under the supervision of Prof. Dr. Turgay Kerem Koramaz (second author).

Received: 31.08.2024 Revised: 25.02.2025
Accepted: 02.04.2025 Available online date: 18.08.2025
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TMMOB Şehir Plancıları Odası

1. Introduction

World population growth and rising per capita food consumption are driving up overall food demand (FAO, 2009). Forecasts for 2050 predict that food demand could increase by 59–98% and production will need to at least double (Valin et al., 2014; Fukasea & Martin, 2020; European Commission, 2019). However, agricultural land is decreasing due to urban expansion and economic pressures, while incorrect practices are degrading the soil structure, and agriculture is responsible for one-third of global greenhouse gas emissions (FAO, 2020; Foley et al., 2005; IPCC, 2020). It is also argued that climate change poses a significant threat to agricultural productivity (Chatham House, 2021).

While cities account for the majority of food demand, economic access, logistical barriers and energy price volatility are key challenges (Cirera & Masset, 2010). Low-income groups have limited access to healthy food; the length of the food supply chain increases the carbon footprint, leading to price volatility and waste. Urbanization increases pressure on agricultural land, threatening local production and deepening external dependency. Since the 2000s, food security, which also includes the ecological dimension, has been addressed within the framework of climate change, shifting from a rural focus to an urban focus, making cities both consumers and producers (Eriksen et al., 2009; Cruch & Riley, 2018).

The Sustainable Development Goals and the Milan Urban Food Policy Pact, signed in 2015, are important global initiatives to reintroduce food into urban planning. The pact positions local governments as key actors in the fight against food waste and the provision of healthy and accessible food, and advocates that cities address these issues in their planning and legislation. The Paris Agreement (2016) aims to develop sustainable and resilient food systems to reduce the climate impact of the current food system, and signatory countries are expected to reduce food-related carbon emissions. While the Farm to Fork Strategy, developed within the scope of the 2020 European Green Deal, aims to create a climate-friendly supply chain from production to consumption, the Food 2030 Strategy (European Commission, n.d.) envisages a sustainable, circular, and healthy structure for urban food systems. The FAO (2018), in its study Integrating Food into Urban Planning, provides examples of urban planners addressing the food system holistically.

In this context, scientific research on the integration of food in urban planning has shown a significant increase since 2010 (Dobele & Zvirbule, 2020). Urban food planning, which was previously addressed only through land use and transportation, is taking shape within the framework of three main research areas: urban food production, food storage analysis, and food access (Brinkley, 2013; Yang et al., 2020). The primary emphasis of urban food production research is urban agriculture. Although urban agriculture is not a new phenomenon, it is playing an increasingly important role in metropolitan food supply. In this context, several cities and institutions have begun to include urban agriculture in their urban food planning goals.

Urban agriculture is addressed in studies on social empowerment and health (Horst et al., 2017; Veenhuizen & Danso, 2007; Warren et al., 2015), local economic development (Mok et al., 2014; Orsini et al., 2014) and ecological and environmental (Artmann & Sartison, 2018; Clinton et al., 2018; Gondhalekar & Ramsauer, 2017) dimensions. Additionally, where this production takes place within a dense urban fabric it has become an increasingly important research topic. While the literature includes numerous studies on site selection based on various objectives and principles of urban agriculture (Appendix 1), studies that address the subject with a holistic approach are quite limited.

This study aims to contribute to the selection of urban agricultural lands for the establishment of a sustainable, safe, and fair food system at the local scale. Beylikdüzü district of Istanbul was selected as the study area due to its urban-rural character and urban development pressure. In the study, Spatial Multi-Criteria Decision Making (S-MCDM) method is utilized to evaluate the factors affecting the selection of urban agricultural lands. Geographic Information Systems (GIS) and Analytical Hierarchy Process (AHP) from multi-criteria decision-making techniques are also used for geographical evaluation.

2. Urban Agriculture in Planning Literature

The urban food system is shaped by agricultural activities carried out in and around the city. These activities are called "intra and peri-urban agriculture" as well as the more common designation of "urban agriculture" (UA). The FAO defines urban agriculture as "the growing of plants and raising of animals for food and other uses within and around cities and towns..." Although there are different definitions for urban agriculture, since food production in urban areas is central to all definitions; it can be described as agricultural activities conducted in and around the city center. It is distinguished from rural agriculture by its integration into local urban economic and ecological systems (Mougeot, 2000) and varies geographically and terminologically, with distinctions such as peri-urban, metropolitan, and urban fringe agriculture (Opitz et al., 2016). Although spatially distant from urban centers, peri-urban and suburban agriculture are an integral part of urban agriculture by producing large quantities of food and supplying urban markets (Opitz et al., 2016). These forms of agriculture are more market-oriented than intra-urban agriculture (Veenhuizen & Danso, 2007). The scale and market orientation are narrowing as rural and peri-urban agriculture shifts to urban agriculture. While urban and rural agriculture are interrelated, urban agriculture plays a critical role in local food system sustainability, addressing not only food supply but also economic and social resilience.

There are many different types of urban agriculture applications. Urban agriculture encompasses open-space forms (community gardens, allotments, backyard gardens, micro-agriculture), evaluated by ownership, actors, business models, and location, as well as building-related forms (rooftop gardens, vertical farming), which occur within or on buildings. And urban agriculture practices also includes urban farms. Community gardens are collective initiatives supported by public or private entities (Mok et al., 2014), while allotments are rented agricultural plots, particularly in Europe (Opitz et al., 2016). Backyard gardens primarily serve household consumption and can evolve into community-driven initiatives (Orsini et al., 2014; Yang et al., 2020). Urban farms operate on a larger scale, integrating commercial activities such as marketing, education, and retail, typically near city peripheries (Yang et al., 2020). Urban agriculture extends beyond land-based activities, incorporating rooftop and indoor farming, hydroponics, and vertical farming—collectively termed micro-agriculture due to their reliance on advanced technologies (Specht et al., 2014; Artmann & Sartison, 2018). These methods, often classified as zero-acre farming, are prevalent in city centers and offer both commercial and recreational benefits (Yang et al., 2020).

Although the link between agriculture and cities weakened as cities became mass consumers after the Industrial Revolution, these two concepts have been inextricably linked throughout history (Steel, 2013). Cities were often established near productive agricultural lands, and the flow of agricultural knowledge shaped urban development (Dobele & Zvirbule, 2020). The Industrial Revolution separated agriculture from urban planning and dragged it into a different direction within the framework of economic relations. While fertile lands in urban areas were allocated to industry and production, fields with little economic value remained accessible for impoverished farmers' agricultural pursuits (Dobele & Zvirbule, 2020). Before World War I, employers or communities adopted the practice of "allotment gardens" for workers migrating from rural areas to cities (Keshavarz et al., 2016), and food security concerns brought urban agriculture back to the agenda during wartime. During and after World War II, "Victory Gardens" were established to increase agricultural production, and 25% of fresh food in the United States was grown in urban agricultural areas (Mok et al., 2014; Keshavarz et al., 2016; Dobele & Zvirbule, 2020). However, in the post-war period, globalization industrialized agricultural production and excluded it from urban planning, and urban agriculture was treated as a secondary issue in planning processes. Conversely, classical planning approaches such as the City Beautiful, Ebenezer Howard's Garden City, and Frank Lloyd Wright's Broadacre City, which were developed to reduce the negative effects of the Industrial Revolution, see urban agriculture as an integral part of the city.

In the post-World War II era, particularly in America, urban agriculture was linked to African-Americans' pursuit of social justice. The quality of life has increased with the effect of modernization and urban agriculture activities have been encouraged in the areas vacated by those migrating from cities to suburbs. Social justice and community engagement became more prominent in the 70s and 80s; economic crises made urban agriculture an important tool, particularly in Africa, and urban agriculture was discussed on a global scale in terms of providing food security, combating poverty, and protecting the environment. Especially in times of economic stress, urban agriculture has been frequently included in the literature and practices regarding beautifying neighborhoods, increasing land value, and empowering citizen participation (Brinkley, 2013).

Sustainability discussions gained momentum with the Sustainable Development Goals (SDGs) of 2015, and agricultural activities carried out in and around the city were directly and indirectly associated with various SDGs. In particular, SDG #2 (Zero Hunger), SDG #3 (Good Health and Well-being), SDG #8 (Decent Work and Economic Growth), SDG #12 (Responsible Consumption and Production) and SDG #11 (Sustainable Cities and Communities) are directly linked to urban agriculture. Thus, food gained importance in urban planning with sustainability discussions (Brinkley, 2013; Morgan, 2013; Bricas & Conaré, 2019), and the Renaissance period of urban agriculture (Dobele & Zvirbule, 2020) began. Food, which was previously addressed only in terms of adequacy or social justice, is now beginning to be addressed through different dimensions of urban planning.

Urban agriculture contributes to the environmental, social and economic dimensions of sustainability. The environmental benefits of urban agriculture include environmental justice (Jerm´e & Wakefield, 2013), land use implication for urbanization (Olsson et al., 2016; Ayambire et al., 2019), regulating extreme temperatures (Clinton et al., 2018), mitigation of urban heat island effect (QIU et al., 2013), reducing the carbon footprint of food systems (Lwasa et al, 2014), mimicking of the natural water cycle (Rogers & Hiner, 2016) and improving biodiversity (Lin et al., 2015; Yaro et al., 2016). Additionally, urban agriculture increases social interaction, social solidarity and community resilience (Voicu et al., 2008; Okvat et al., 2011; Shimpo et al., 2019), contributes to household food security and food access (Horst et al., 2017; Khumalo et al., 2019) and is closely associated with community wellbeing and nutritional diets (Warren et al, 2015; Egli et al., 2016; Lin et al., 2017). It provides potential economic benefits in areas including reducing input costs such as transportation and fuel (Moustier & Danso, 2006), high-profit margins for the producer with a short supply chain (Starr et al., 2003), reducing urban poverty (Zezza & Tasciotti, 2010) and self-sufficiency (Mok et al.,

2014). Although there are plausible arguments for economic benefits, there is little evidence to support them (Eiter et al., 2025). Nevertheless, urban agriculture can increase property values (Voicu & Been, 2008). This situation brings with it discussions about urban agriculture causing gentrification (Meenar et al., 2017; Hawes et al., 2022).

The global urban farming market is expected to grow from USD 160.22 billion in 2024 to USD 290.11 billion by 2032 (Business Research Insights, n.d.). With the increasing interest in urban agriculture in recent years, local governments have taken on a role both as a developer, supporter and regulator of urban agriculture and developed policies. In the USA, several municipalities are developing Urban Agriculture Zones and Land Tenure Regulations to facilitate urban agriculture (Meenar et al., 2017); the 40 most populous cities have more than 400 urban agriculture-related policies (Halvey et al., 2021), and almost one-fifth of city governments are developing food plans and strategies (Clark et al., 2021). There are more than 500 community gardens in New York City, while urban agriculture in the Buffalo-Niagara metropolitan area produces more than 10% of GDP (Raja et al., 2014). In Europe, the 2008 economic crisis led to the establishment of community gardens in countries around the Mediterranean (Fox-Kamper et al., 2023). Developments such as the Milan Urban Food Policy Pact, the European Green Deal 2020 and the Food 2030 Strategy support local governments and entrepreneurs in urban agriculture. While many metropolitan areas such as London include urban agriculture in their strategic plans, agriculture-focused urban development approaches such as the Almere Oosterwold plan are also attracting attention.

3. Method

3.1. Study Area

Approximately one in every five people in Türkiye's population lives in Istanbul. Arable land per person has declined in Türkiye during the past 20 years, from 0.35 ha to 0.23 ha, and in Istanbul, from 0.007 ha to 0.004 ha (IMM, 2021). Istanbul covers only 3.2‰ of the country's agricultural lands[1] and 1.6‰ of the country's agricultural production.[2] Despite being the country's most populous city and the top food consumer, the limited food production has increased its dependence on other cities throughout time. Feeding the aforementioned megacity necessitates intricate and thorough food planning. In the "Istanbul Food Strategy Document" published by Istanbul Metropolitan Municipality (IMM) in 2021, urban agriculture was discussed under the title "Climate Crisis and Nature-Friendly Stable Agriculture" with the aim of "starting urban agriculture in unused areas, balconies and backyards in neighborhoods and increasing urban vegetable gardens". The same document interprets urban agriculture as a recreational and educational opportunity and as a shelter in case of disaster (Fig. 1).

Located in the southern part of the European side of Istanbul, Beylikdüzü district is among the districts that combine rural and urban textures in the city's food strategy. It has a total size of 37.78 km² and a coastal length of 12.4 km to the south. The annual average temperature of the district is 14.3 °C, the coldest months are January and February, and the warmest months are July and August. The district is connected to the megacity's infrastructure via the D-100 highway to the north. While Beylikdüzü used to be a settlement with rural characteristics in the past years, after 1990, with the effect of the D-100 highway, the usage areas quickly turned into industrial facilities and mass housing areas, and the district started to receive high rates of migration. The population of the district, which was 185,633 in 2008, has more than doubled in the last 15 years, reaching 409,347 in 2023 (TÜİK). According to the 1/100000 Scale Istanbul Environmental Plan, the northern side facing D-100 has been determined as the second level sub-center (M2) for Istanbul. Ambarlı Strategic Industrial Zone, which is of regional importance, is located in the east of the study area (Fig. 2).

The district includes land uses such as Organized Industrial Zone, Small Industrial Zone, other industrial areas, energy production area, storage and logistics, and marina, while residential areas constitute 40%; urban density is 93 per/ha. Although the district has a long coastline, the dispersion of the settlement and the fragmented and private use of the coastline increase the importance of the Yaşam Vadisi as a public space, the largest green area of the district extending from north to south. The district has 10 neighborhoods with different characteristics; the northern neighborhoods are densely populated due to their proximity to the D-100, and population and building density decrease toward the south.

The district has experienced a great loss of agricultural land in the last ten years. In 2013, the total agricultural land in the district was 169.1 ha; 20.8 ha of this was fallow, 2.4 ha of vegetables, 145.9 ha of grain and other types of planting. According to 2023 data, these rates have decreased to 0, 0.4 and 30 ha, respectively, and the total agricultural land in the district is 30.4 ha (TÜİK). With this decline, the district will account for 0.03% of the province's agricultural land in 2023, down from 0.23% in 2013. Although the district's agricultural production is not extremely important for the city, increasing industrial-

[1] This rate was calculated according to TÜİK 2023 agricultural area data. Fruit, fallow, vegetable, ornamental plant, grain and other plant production areas are included.

[2] This rate was calculated according to TÜİK 2023 production amount data. Vegetable, fruit, grain and other plant production, greenhouse vegetables and greenhouse fruits are included.

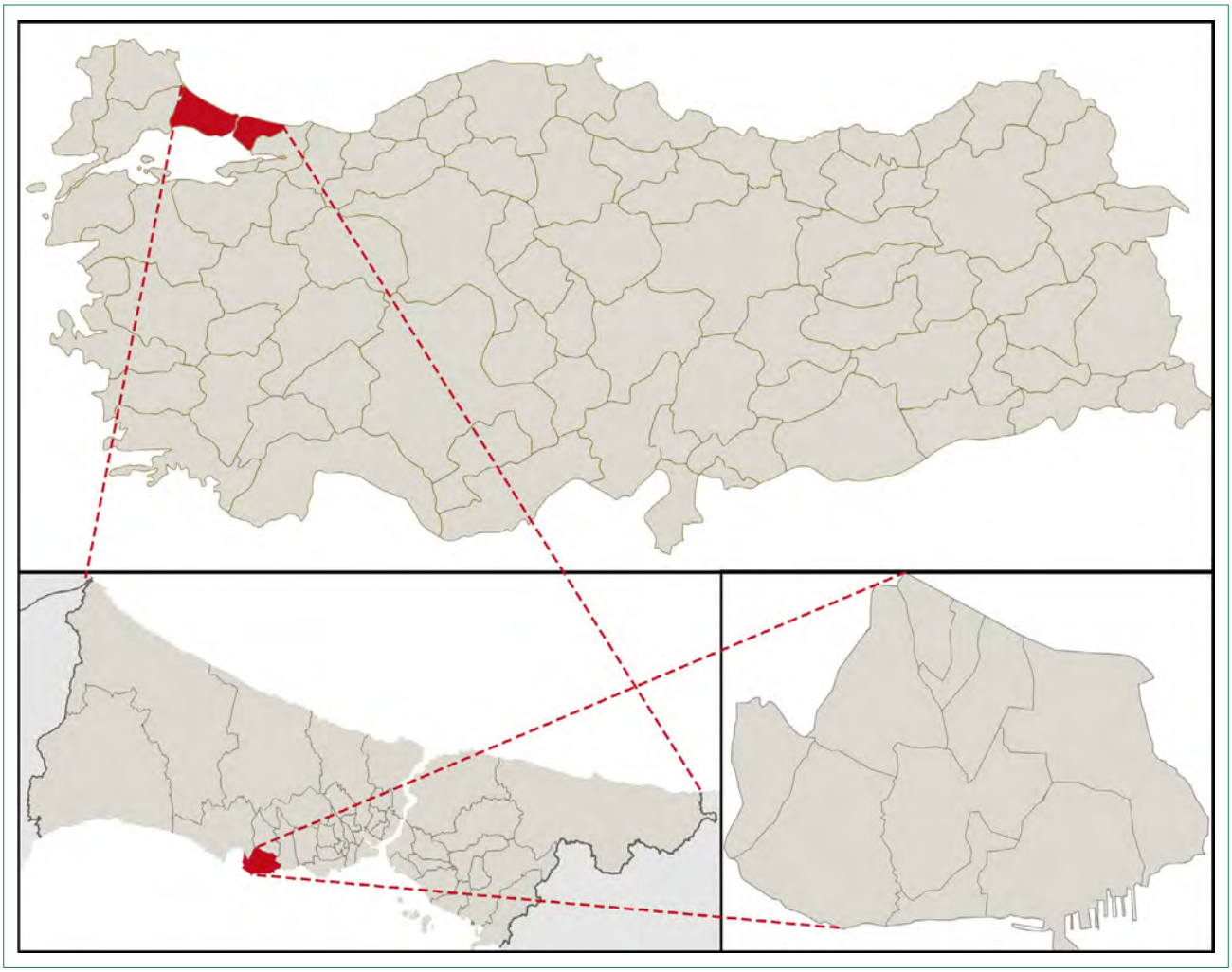

Figure 1. Geographical location of the study area (İstanbul – Beylikdüzü).

ization and urban development, especially in the north of the district, are gradually reducing agricultural production. Furthermore, according to land use statistics from the IMM Urban Planning Directorate, the district has no agricultural land and 1081 hectares of vacant land. The areas that appear as cultivated in aerial photographs are classified as vacant lands. In the Beylikdüzü Municipality GIS Application's zoning plan, the same areas are mainly classified as residential. Figure 3 depicts how industrial and construction activity in the study area evolved over time, beginning with the D-100 road and moving towards the Marmara Sea.

The district is notable for being an industrialized sub-region with rural qualities that is nonetheless easily accessible to the megacity. The district's socio-economic situation and education level are above average compared to the city in general. According to the IMM's Quality of Life Index (2023), the district ranks slightly below the city average, but it performs better in gender equality than other districts in the "outer periphery" group with which it is evaluated.

The local municipality evaluates living gardens and hobby gardens under 'ecological system protection' in its strategic plan (Beylikdüzü Municipality, 2022). The local administration provides impoverished individuals with items produced in Yaşam Vadisi's 2-hectare urban agriculture area through the "Food Bank Service" (Beylikdüzü Municipality, 2021). Concurrently, a second urban agricultural area of 1.97ha is planned by the local municipality, focusing on aromatic plants. The local government established a 0.5ha Küçük Bahçivalar Parkı (Little Gardeners Park) for children to learn and engage in urban agriculture. The district also has ecology-themed private schools at primary and kindergarten levels. One of the ecological/organic markets, which are limited in number throughout Istanbul, is also located in Beylikdüzü. The district is an appropriate case for urban agriculture research due to the above-mentioned characteristics, its partially rural character despite the intense construction pressure, and the local government's food-oriented planning approaches and initiatives.

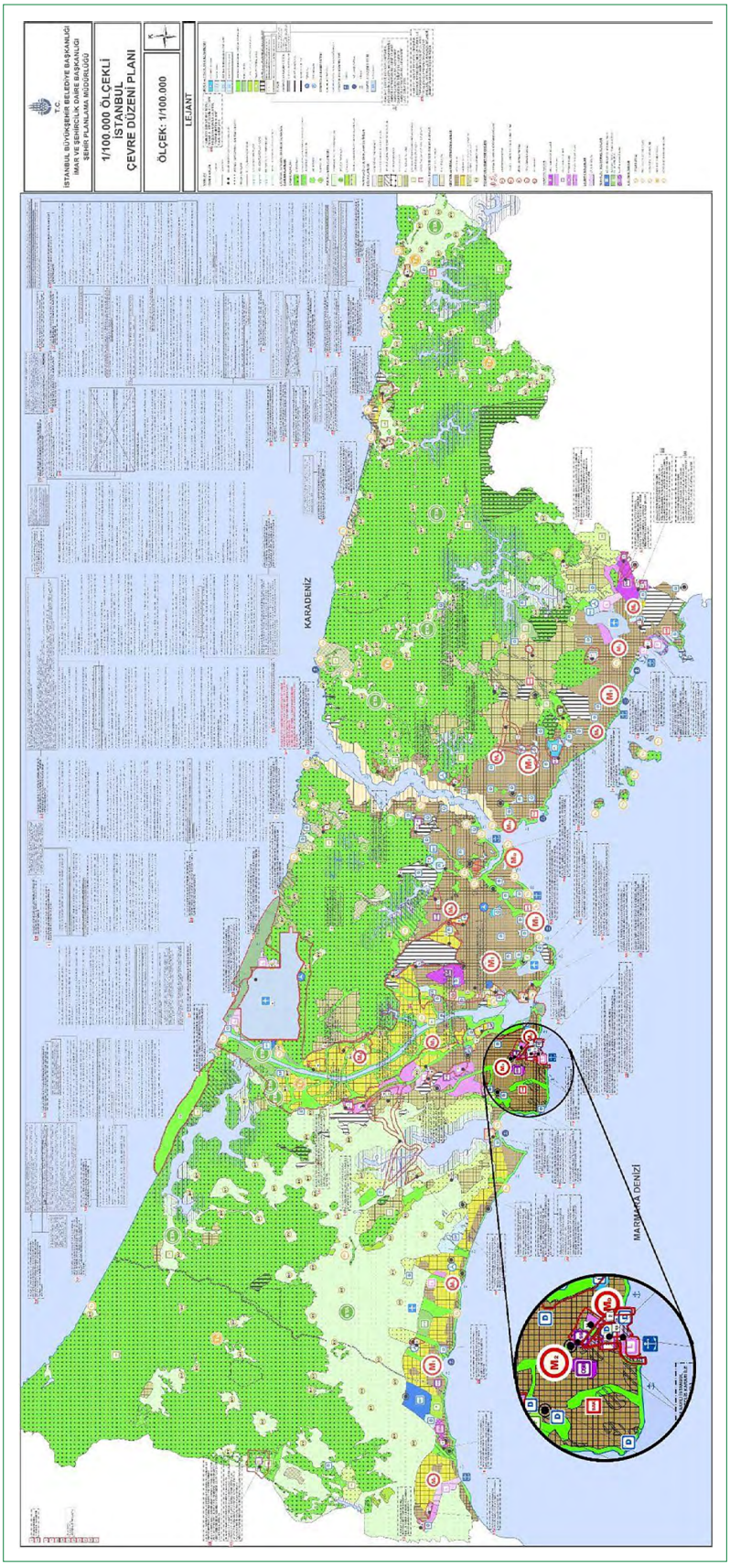

Figure 2. Beylikdüzü in 1/100000 scale Istanbul Environmental Plan.

3.2. Identification of Parameters

A comprehensive literature review was conducted to identify spatial indicators for urban agricultural practices to develop an index that aims to create a "more sustainable, secure, and equitable food system" in urban agricultural land selection at the local scale. Due to the varying requirements of different urban agricultural practices, this study focused only on practices that take place in open areas, excluding urban agriculture on building roofs, balconies, and vertical surfaces. As a result, 10 parameters and 20 sub-criteria were determined by combining the relevant sub-criteria under parameters to facilitate the multiple decision-making method. As seen in Appendix 1, these 10 Parameters: Constraints, Ownership status and land supply, Demographics and Population, Transportation and Accessibility, Security levels, Pollution sources, Distribution, Prevention and Storage, Green system, Topography, and Soil and Geological structure.

Among the sub-criteria, "Empty field" (Q1) and "Field size" (Q2) were chosen as constraints since they are immutable characteristics that will always be deemed fundamental in the selection of urban agricultural land.

3.3. Data Collection and Classification of Sub-criteria

Data collection for this study was mainly carried out through two methods: 1) data collection from TÜİK, IMM Open Data Portal and Beylikdüzü Municipality and 2) point location data via Google Maps (Table 1). Vector and raster data were combined, organized and spatial analyses were performed using the geographic information system (GIS). Previous studies in the literature were taken as a basis for the evaluation of sub-criteria (Appendix 1). Each parameter contains a maximum of three sub-criteria. Since the maximum number of classes formed by the intersection of the sub-criteria under the parameter is eight, a scale was used to compare classes, with 1 representing the lowest and 10 representing the highest preferability. Table 2 presents the weights in the evaluation of the sub-criteria that constitute the parameters.

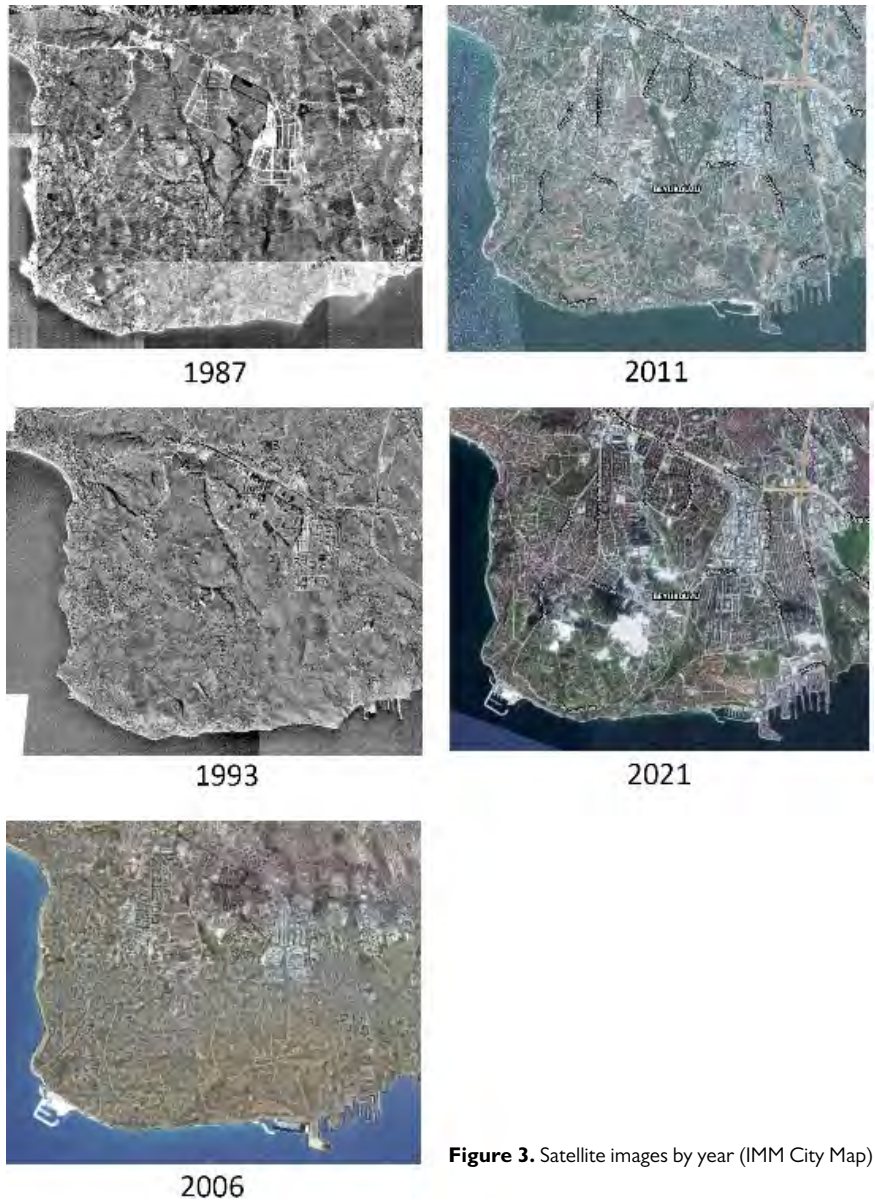

Figure 3. Satellite images by year (IMM City Map)

Firstly, neighborhood-scale population, child (0–14) rate, elderly (65+) rate, child and elderly population and SES scores were obtained via TÜİK and IMM Open Data Portal. Within the scope of demographic structure sensitive to food supply (Q5), the dependency rates of the neighborhoods were calculated and divided into three categories according to the natural distribution; the highest dependent population was classified as 3, and the lowest as 1. Socioeconomic status (SES) scores were reverse coded, with the lowest value receiving the highest score, prioritizing communities with the lowest socioeconomic level and the highest dependent population (Table 3). For High Population Density (Q6), population densities were calculated at the neighborhood scale over residential and mixed-use areas, the natural distribution method was used, and the density values were divided into three groups as 0–300 per/ha, 301–600 per/ha and 601–934 per/ha. Q5 and Q6 maps were integrated to create a Demographic and Population map, and areas with high food sensitivity were prioritized. To ensure fair food access, areas with high Q5 values received higher scores, while those with high levels of both criteria received 10 points.

Secondly, for low land value (Q4), the "Land Square Meter Unit Value Inquiry" values for 2023 were obtained from turkiye.gov.tr based on the main boulevard/street of each neighborhood. These values are based on the land value price values calculated by the Ministry of the Treasury for the taxation system and obtained from official records. In urban agriculture,

Table 1. List of data and sources

Data	Source	Detail	Form
Land use	Local municipality	Pollutant sources, social facilities, storage, and green spaces, empty areas	Digital
Public ownership	Local municipality	Population	Digital
Demographic data	TÜİK	SES scores	Digitized
Land value	IMM open data portal Ministry of Treasury (turkiye.gov.tr)	Land square meter unit value ınquiry - main street/boulevard or street for the year 2023	Digitized
Public transport	Beylikdüzü municipality ınformation processing directorate	Bus, minibus lines routes	Digitized
Bike lanes	Local municipality's transportation master plan (URL-8)	Planned bike route	Digitized
Transportation alternatives	Google maps		Digitized
Location of food sales	Google maps	Bazaar, market, delicatessen, greengrocer, and butcher areas	Digitized
Geology and soil structure	Istanbul geological map from Istanbul metropolitan municipality		Digitized
Erosion	No Data		No Data
Security level	No Data		No Data

SES: Socioeconomic status; IMM: Istanbul metropolitan municipality.

public ownership of land and low land value will reduce costs and facilitate implementation (McClintock & Cooper, 2010; He et al., 2012; Opitz et al., 2016). In the Ownership status and Land Supply parameter, areas with low land value and public ownership obtained the greatest score (10), while areas with private and high land value received the lowest score (1).

Moreover, for proximity to public transport networks (Q7), bus and minibus line arrangements produced by the Beylikdüzü Municipality Information Processing Department Urban Information Systems Bureau in 2019 have digitized public transport arteries. The arteries were divided into three groups according to the density of public transport; a 250 m buffer was applied within a 5-minute walk of the public transport lines. According to the Transportation Master Plan (Çalık, n.d.), cycling paths were digitized, and a 100 m buffer (Smith et al., 2021) was applied for Q8. Main transportation arteries were identified via Google Maps, and a 500 m buffer (He & Genovese, 2012) was applied for Q9. Transportation and accessibility analysis was conducted by integrating Q7, Q8, and Q9 criteria, with public transport identified as the key factor. Transportation arteries were weighted more heavily than cycling infrastructure.

Similarly, for Proximity to distribution centers (Q12), food sales points (bazaars, markets, greengrocers, butchers, delicatessens) in the district were determined via Google Maps, processed into the GIS environment, and an access distance of 500 m (He & Genovese, 2012) was applied. For Q13, municipal service areas, education areas, administrative areas, public areas, cultural facilities, social facilities, sports areas, health areas and religious areas were accepted as social service areas, and a 250m–500m buffer was applied. For Proximity to preservation and storage areas (Q14), storage areas were obtained from land use data and were addressed with 500 and 1000 m buffer areas. The Distribution, Prevention and Storage parameter, which is formed by the combination of Q12, Q13 and Q14 sub-criteria, has been scored by accepting access to food sales as a priority, social facilities have been evaluated as alternative distribution areas, and thus it is aimed to integrate healthy food sales areas more easily into the existing food system.

Further, Organized Industrial Zones, Industrial Areas, industrial service areas, ports, marinas, piers and energy storage areas were accepted as pollutant sources in land use, and a 250m buffer was applied around these areas to create the Q11 sub-criterion and Pollutant Sources parameters. Similarly, under the Green System parameter, green areas in the district were obtained from land use, and a 500m buffer (Orsini et al., 2014) approach was applied for Q15.

Sub-criteria Q16 and Q17 (McClintock et al., 2013) and Q18 (Thapa & Murayama, 2008) were considered under the Topography parameter, and areas with high aspect, slope less than 10% and drainage buffer 300m distance were prioritized. Areas with a slope greater than 30% were eliminated as they were not suitable for agricultural activities.

Table 2. Classification of sub-criteria

1.0. Constraints				
Q2 \ **Q1**	**Vacant**	**Full**		
<0.2ha	Eliminated	Eliminated		
>0.2ha	Accepted	Eliminated		
1.1. Ownership status and land supply				
Q4 \ **Q3**	**Public**	**Private**		
Low (659–1350)	10	8		
Middle (1351–2700)	7	6		
High (2701–4334)	5	1		
2.1. Demographics and populations				
Q6 \ **Q5**	**Low (0–1–2)**	**Middle (3)**	**High (4)**	
Low (0–300)	1	4	7	
Middle (301–600)	3	5	9	
High (600+)	6	8	10	
2.2. Transportation and accessibility				
Q7	**Within 250m**	**Outside 250m**		
Q9 \ **Q8**	**Within 100m**	**Outside 100m**	**Within 100m**	**Outside 100m**
Within 500m	10	9	7	5
Outside 500m	4	3	2	1
3.1. Pollutant sources				
Q11	**Within 250m**	**Outside 250m**		
	2	10		
3.2. Distribution, prevention and storage				
Q12	**Within 500m**	**Outside 500m**		
Q14 \ **Q13**	**Within 500m**	**Outside 500m**	**Within 500m**	**Outside 500m**
Within 1000m	10	8	7	4
Outside 1000m	9	6	5	1
3.3. Green system				
Q15	**Within 500m**	**Outside 500m**		
	2	10		
4.1. Topography				
Q16	**Suitable**	**Unsuitable**		
Q17 \ **Q18**	**Within 300m**	**Outside 300m**	**Within 300m**	**Outside 300m**
<10%	10	8	9	6
10–30%	7	5	4	1
>30%	eliminated			
4.2. Soil and geological structure				
Tdg	10			
Tdç	9			
Tcç + Tçg	8			
Tık	7			
Tçb	6			
Yd	1			

Table 3. Descriptives for socio-economic figures in Beylikdüzü Neighborhoods

Neighborhoods	Population 2022 (TÜİK)	SES (Mahallem İstanbul; IMM open data portal)	Child population ratio (0-14) (%) (neighborhood report card; IMM)	Elderly population ratio (65+) (%) (neighborhood report card; IMM)	Child population (calculated according to neighborhood report card)	Elderly population (calculated according to the neighborhood report card)	Child and elderly population	Population class	SES value	Total score for Q5	Land value (TL)
Adnan Kahveci	113.989	B	24	6	27357	6839	34197	3	1	4	2421.98
Cumhuriyet	23.427	B+	20	9	4685	2108	6794	1	1	2	4333.72
Büyükşehir	21.902	B	17	11	3723	2409	6133	1	1	2	3951.05
Barış	58.388	B	20	8	11678	4671	16349	2	1	3	3820.26
Beylikdüzüos	1	0	0	0	0	0	0	0	0	0	658.78
Yakuplu	57.468	C	20	8	11494	4597	16091	2	2	4	1152.86
Marmara	31.889	B	24	6	7653	1913	9567	1	1	2	2699.69
Kavaklı	58.335	C	26	5	15167	2917	18084	2	2	4	1582.36
Sahil	6.724	C	26	6	1748	403	2152	1	2	3	1541.99
Dereağızı	19.427	C	24	6	4662	1166	5828	1	2	3	833.16
Gürpınar	21.286	D	24	6	5109	1277	6386	1	3	4	1840.7

SES: Socioeconomic status; IMM: Istanbul metropolitan municipality.

There is no data on the erosion map of Istanbul (Q19) regarding the district, and according to the soil capacity (Q20) data obtained from the IMM, the district was defined as a built-up area. However, the geological structure data for the district were allocated from the local municipality. Thus, the Soil and geological structure parameter was considered as an independent parameter without sub-criteria for the area, and the relationship between geological formations and agriculture was evaluated according to the "Istanbul Provincial Area Geology" (Özgül, 2011). Neighborhood-scale security data (Q10) for Beylikdüzü is unavailable while existing studies focus on Istanbul as a whole without offering intra-district comparisons.

3.4. Weighting Parameters

In the initial stage of spatial multi-criteria decision-making, the Analytic Hierarchy Process (AHP) was applied to address decision-making challenges. Based on expert-rated comparison matrices, this method provides an analytical framework for integrating actual measurements and preferences (Saaty, 1987). AHP permits the creation of analytical information using a logical planning approach and the production of inclusive decisions rather than subjective ones (Koramaz, 2014). It is a frequently used method in urban planning, especially in land use decisions and participatory procedures.

The AHP is frequently employed in urban agriculture research (Kirnbauer & Baetz, 2012; Motlagh et al., 2021; Peng et al, 2015; Perez et al., 2014; Wang et al., 2021). Research on urban agricultural site selection combines several methods with the GIS environment, extending beyond the AHP methodology (Akbulut, et al., 2018; Akıncı, et al., 2013; Bozdağ, et al., 2016; He & Genovese, 2012; Kazemi & Hosseinpour, 2022; Sarı & Koyuncu Sarı, 2021; Seyedmohammadi et al., 2019; Sonneveld et al., 2021; Thapa & Murayama, 2008; Thapa, et al., 2011; Türker & Akten, 2023; Ustaoğlu et al., 2021; Weerakoon, 2014; Yalew et al., 2016).

To minimize cognitive overload and respondent fatigue, the pairwise comparison matrix was structured based on the main parameters rather than all sub-criteria (n=18). The "Constraints" parameter, deemed essential for urban agriculture, was excluded from the comparison matrix. Instead, a nine-parameter (n=9) matrix with 36 comparisons was developed. A Likert scale ranging from 1 to 7 (only odd numbers) was used for evaluation.

The AHP participants were determined as academia, public institutions, civil society organizations and private urban agriculture enterprises. The survey was distributed to 15 academics[3] yielding six responses. Three local government representatives involved in urban agriculture in Istanbul were contacted, but none responded. One private urban agriculture enterprise participated, while two food-focused NGOs declined due to a lack of expertise. In total, seven participants[4] from diverse disciplines contributed to the AHP process.

[3] 5 urban planners, 4 landscape architects, 1 agricultural engineer, 1 lawyer, and environmental politician, 1 economist, 1 environmental engineer.

[4] 3 Urban Planners, 2 Landscape Architects, 1 Agricultural Engineer, 1 Private Business Representative.

3.5. Spatial Data Analysis

The second part of the study includes the superimposition of the spatial analyses of the weighted parameters obtained as a result of AHP. The Map Algebra method, which allows mathematical operations with raster layers, was used via ArcMap 10.3 software. First, since there was no data for Security Level, the AHP results were recalculated by removing this parameter. Then, the spatial analyses performed for each parameter were converted to raster data. Figure 4 shows the spatial analyses for the remaining eight parameters for Beylikdüzü.

In the Map Algebra analysis, the potential urban agricultural areas of the district were determined and scored between 1 and 5 and ranked as very suitable, suitable, medium, less suitable and not suitable. Finally, the unweighted Constraints parameter was included. For Q1 (Empty Field), identified vacant areas in land use, and for Q2 (Field Size), areas ≥0.2 ha (He & Genovese, 2012; Opitz et al., 2016) were selected, and analysis results were filtered.

4. Results

4.1. AHP Results

As a result of the AHP, λmax=9.851090886 and CI were calculated as 0.1063863608. Random Consistency Index (RI) was accepted as 1.452 (n=9) and the Consistency Ratio was calculated as 0.07326884353. Since this value was <0.10, the comparison matrix was considered consistent.

Pollution Sources parameter is the primary factor in urban agriculture site selection, accounting for 23.1%. This is succeeded by Ownership Status and Land Supply, which constitute 16.8% of the total. Transportation and Accessibility ranks third with 10.4% (Table 4). The high weights of these three parameters indicate that factors based on the built environment are a priority in urban agriculture area selection. The high weights of these three parameters indicate that factors based on the built environment are a priority in urban agriculture area selection. Pollution Sources being at the top of the list highlights the health assurance of urban agriculture, while Ownership Status and Land Supply reveal the importance of applicability. Transportation and Accessibility can contribute to urban agriculture working as a system integrated with daily life. Security Level, Demographics and Populations parameters are at the middle level, while Soil and Geological Structure, Green System, and Topography have the lowest weight. The findings indicate that socioeconomic factors exert a more significant influence than natural environment elements in the selection of urban agriculture areas. Specifically, the negligible impact of topography suggests that the natural environment is comparatively less effective in this regard.

The Security Level parameter was removed from the AHP process and recalculated due to the absence of data regarding the study area. The AHP was conducted with λmax=8.696468427, the consistency index (CI) was calculated as 0.09949548956 and the Random Consistency Index (RI) was accepted as 1.41 (n=8). Because the weights were less than 0.10, the consistency ratio (0.07056417699) was deemed reliable. According to this AHP, the ranking of the first three did not change, but the proportional increase was the highest in Pollutant Sources, which was again in the first place. Conversely, the Demographics and Populations parameter experienced a decline in its ranking, while the Distribution, Prevention and Storage and Green System parameters exhibited an increase (Table 4).

4.2. Urban Agriculture Area Selection in Beylikdüzü

The parameters evaluated between 1–10 for suitability for urban agriculture were subjected to Map Algebra analysis with AHP weights (Table 4); in this analysis, the highest value was determined as 9.6519, the lowest value as 2.1898 (excluding those eliminated) and the average value as 6.4132. The groupings were evaluated according to natural breaks, and the range of 2.19–4.38 was classified as "not suitable", the range of 4.39–5.67 as "less suitable," the range of 5.68–6.63 as "medium", the range of 6.64–7.77 as "suitable" and the range of 7.78–9.65 as "more suitable". The distribution of groups for the entire district before the inclusion of the Constraints parameter is 5.33%, 26.20%, 26.05%, 24.45%, and 17.97%, respectively. It should be emphasized that there is no Q1. Empty Field and Q2. Field Size in these rates.

With Q1 and Q2 restrictions, 18.19% of Beylikdüzü is "more suitable" (266.19 ha) for urban agriculture, while 28.82% is "suitable" (421.63 ha). "Moderate" areas comprise 26.70% (390.73 ha), "less suitable" areas constitute 21.83% (319.48 ha), and "not suitable" areas consist 4.45% (65,16 ha) (Fig. 5).

The final research reveals that the sites "not suitable" for urban agriculture in Beylikdüzü district are concentrated around the port region in the Marmara neighborhood, which is close to pollution sources and does not match the standards of other parameters. Similarly, "less suitable" areas partially meet the requirements of other parameters and are located around pollutant sources. "Suitable" areas are concentrated especially in Dereağzı and Kavaklı neighborhoods in the southwest of the district, where construction activities have not yet been very intense. Three focal points stand out throughout the district for "more suitable" areas: Gülpınar-Dereağzı, Kavaklı, Marmara-Kavaklı.

While the Gülpınar-Dereağzı axis stands out due to its high accessibility, low land value and distance to pollution sources; the fact that the northern part is very close to

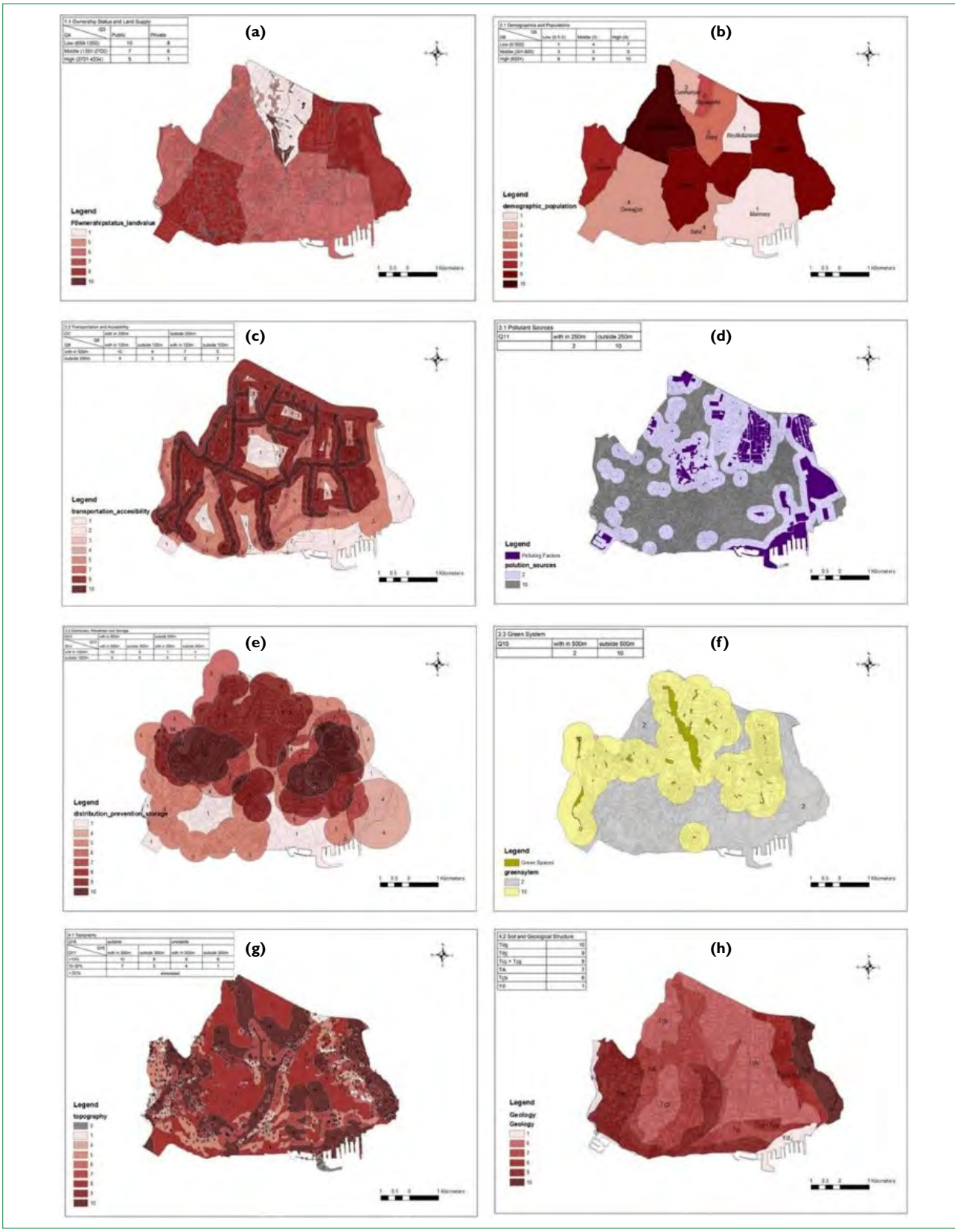

Figure 4. Spatial analysis of parameters **(a)** ownership status and land supply **(b)** demographics and population **(c)** transportation and accessibility **(d)** population sources **(e)** distribution, prevention, and storage **(f)** green system **(g)** topography **(h)** soil and geological structure.

Table 4. Urban agriculture site selection index

Parameters	Definition	Sub criteria	Parameter weights	Rank	Parameter weight without security level	Rank
Constraints	Accepted as a condition for field selection	Q1. Empty field Q2. Field size	–	–	–	–
1.1. Ownership status and land supply	Facilitating factors in the effective budgeting and implementation of urban agriculture	Q3. Public ownership Q4. Low land value	16.8%	2	18.11%	2
2.1. Demographics and population	Widespread access of urban farmland to demographics and populations in need of food access	Q5.Proximity to the demographic structure sensitive to food supply Q6. High population density	8.8%	5	8.91%	7
2.2. Transportation and accessibility	The fact that urban agricultural areas can be fed with different transportation networks, users can reach the area with alternative modes, and the products can be distributed easily	Q7. Proximity to public transportation networks Q8. Access to the area with walking and cycling paths Q9. Proximity to transportation alters	10.4%	3	10.49%	3
2.3. Security level	A high level of security and a controlled environment to ensure the safety of users and products	Q10. High security	9%	4	–	–
3.1. Pollution sources	Distance from polluting factors such as industry, port, etc. in order to preserve the nutritiveness of the food	Q11. Distance from polluting factors in land use	23.1%	1	26.23%	1
3.2. Distribution, prevention and storage	Proximity of distribution and storage areas to the production area in order to preserve the nutritiveness of the food and to reduce the waste rate in the distribution, storage process and to manage it effectively	Q12. Proximity to distribution centers Q13. Proximity to social facilities as alternative distribution stations Q14. Proximity to preservation and storage areas	8.6%	6	10.22%	4
3.3. Green system	Proximity of urban agricultural areas, proximity to green areas for holistic ecological infrastructure	Q15. Integration with the holistic green system within the district	8.2%	8	9.43%	5
4.1. Topography	The suitability of the topographic features of the land, including aspect, slope and drainage, for urban agriculture	Q16. Aspect level Q17. Low slope Q18. Drainage suitability	6.6%	9	7.24%	8
4.2. Soil and geological structure	The suitability of the geological structure and soil structure for urban agriculture	Q19. Low erosion risk Q20. Agricultural suitability of soil structure	8.5%	7	9.38%	6

distribution areas, the population with high food sensitivity lives in it, the green areas remain within the coverage areas and its geological formation distinguish this region from the other two regions. Kavaklı, the geographical core of the district, is particularly noteworthy due to its extremely high topographic parameter drainage adaptability. Subsequently, it draws attention with its proximity to Yaşam Vadisi, which is the backbone of the green infrastructure of the district. Finally, The Marmara-Kavaklı region stands out in terms of demographic and population parameters with its proximity to sensitive groups, distribution, prevention and storage areas and areas with low land value; the Kavaklı region stands out in terms of topography parameters with its very high drainage suitability and proximity to Yaşam Vadisi.

Figure 5. Suitable urban agriculture areas of Beylikdüzü District.

The extent to which the areas suitable for urban agriculture determined in the study will meet the fresh food needs of the district's population may be the subject of a separate study. However, it is possible to estimate by considering the production capacity of the district's 2-hectare garden (Yaşam Vadisi) that is currently producing. According to the official website of the local municipality, at least 30 tons of product is obtained from the garden area in Yaşam Vadisi in summer and winter, and 60 tons of product is obtained annually. Tomatoes, cucumbers, zucchini, eggplant, and pepper varieties are planted in the summer; and lettuce, lettuce, cress, arugula, cauliflower, leek, spinach, radish, broccoli, chard, onion, carrot, beet, chard, and cabbage varieties are planted in the winter. Food diversity is essential for sustainable and healthful diets, even if producing only one type of food results in lower carbon emissions when food is considered. According to the World Health Organization, an individual should consume at least 400 grams of fruit and vegetables per day for a healthy diet (WHO, 2020). This indicates that at least 146 kilograms of fresh food are needed annually for the average person.

According to the 2022 population of Beylikdüzü district, the district needs at least 60273 tons of fresh food per year. If food production is carried out in all areas suitable for urban agriculture determined within the scope of this study (current production in Yaşam Vadisi is taken as a basis), 72% of the fresh food needs could be satisfied. However, since it is not sustainable and realistic to allocate all the land specified for urban agriculture activities, it is important to evaluate the most suitable lands. If the "more suitable" and "suitable" areas with the highest suitability value are implemented for urban agriculture, 34% of the district's fresh food needs could be fulfilled. In a more realistic scenario, only the "more suitable" areas are expected to meet 13% of the fresh food needs. Subsequently, if the district's population is projected to reach 825,000 in 2050, it is anticipated that 36% of the district's annual fresh food demands may be satisfied. However, this estimate ignores the demand for other needs of the increasing population. In a more conceivable scenario, if only "more suitable" areas are allocated for the fresh food needs of the 2050 population, it can be predicted that 6% of the need will be met. It has been calculated that if "suitable" areas are included, the rate could rise to 17%.

In 2018, the transportation of products from different cities of Türkiye to the Bayrampaşa and Ataşehir wholesale markets under the control of the IMM released approximately 100 kilotons of CO_2 (Greenpeace, 2019). The ratio of the Beylikdüzü population to the Istanbul population in the same year is expected to be 2.2 kilotons of CO_2 from the transportation of wholesale products coming from outside to Istanbul, and this rate is expected to be 2.73 kilotons of CO_2 in 2022.[5] Local fresh food production would shorten the supply chain, reducing carbon emissions. Utilizing the "most suitable" areas identified in this study for urban agriculture could meet 13% of the fresh food demand of the 2022 population, contributing to a reduction in associated CO_2 emissions. Accordingly, if it is assumed that there is no need to transport fresh food produced in the "most suitable" areas from outside the city, approximately 350 tons of CO_2 will be saved.[6] In the best-case scenario where all areas identified within the scope of the study are used for urban agriculture, this rate could save 1.96 kilotons of CO_2.[7]

5. Discussion

This study aimed to examine the urban agriculture site selection to achieve a more sustainable, secure, and fair food system at the local scale in Istanbul Beylikdüzü, utilizing a multi-criteria decision-making method. The study contributes to the selection of land use decisions in urban planning and the applications of municipalities at the local scale, thus serving the land use strategy and food planning.

5.1. Choosing the Right Location: The Most Critical Parameters

Research on urban agricultural land selection parameters reveals various approaches and corresponding outcomes. The first group is studies focusing on natural structure parameters (Akıncı et al., 2013; Akbulut et al., 2018, Bozdağ et al., 2016; Kamezi & Hosseinpour, 2022; Seyedmohammadi et al., 2019; Yalew et al., 2016). The scales of these studies cover large urban-rural hinterlands and focus more on peri-urban agriculture. These studies generally evaluate soil structure, soil suitability for agriculture, and topographic parameters. Studies that reveal important factors for land selection other than natural factors in dense urban construction are quite limited. Land value, population, and housing density have been revealed to be the most significant factors outside the natural environment parameters (He & Genoverse, 2012). Consequently, the findings are consistent with previous research on the importance of land supply.

Studies combining two approaches evaluate the parameters required for urban agriculture land selection in complex urban spaces in a more sophisticated ways (Sarı & Koyuncu Sarı, 2021; Thapa & Murayama, 2008; Türker & Akten, 2023; Ustaoğlu et al., 2021; Weerakoon, 2014). These studies, which concentrate on metropolitan areas rather than vast geographic areas, demonstrate that transportation and land use have a significant role in site selection. This study aligns with the third mentioned group, confirming the literature on land use (pollutant sources) and land supply while highlighting the limited consideration of environmental factors like soil structure. However, natural factors compete with artificial factors such as land use in some studies (Sarı & Koyuncu Sarı, 2021; Thapa & Murayama, 2008; Ustaoğlu et al., 2021). It is noteworthy that soil structure holds greater significance than topographic characteristics, regardless of the overall hierarchy of environmental factors, underscoring the robustness of the study's findings.

5.2. Meeting Local Food Needs

Galzki et al. (2017) calculated that urban agriculture based on the foodshed model could provide enough food for the entire population in selected areas of Southern Minnesota, but only one-third in New York State. McClintock et al. (2013) found that urban agriculture on public lands in Oakland could meet 2.9–14.5% of current food consumption and on private lands 2.1–24.5%. According to Orsini et al. (2014), rooftop gardens in Bologna have the potential to produce more than 12,000 tons of vegetables per year, fulfilling 77% of demand. Saha & Eckelman (2017) determined that 7% of the land in Boston is suitable for rooftop and 10% for ground-level agriculture, and that if all suitable areas were used most efficiently, the city could meet 1.5 times its food needs.

The findings obtained in Beylikdüzü demonstrate that the most suitable lands for urban agriculture can meet 13% of the fresh food demand in the most realistic scenario, and 72% if all areas are used for urban agriculture. Beylikdüzü has significant potential for local food production and presents similar characteristics to studies in the literature. However, the fact that the research area is part of a metropolitan city and its external dependency should not be ignored. Moreover, the importance of production capacity and on-building applications such as rooftop gardens in meeting the food needs of cities locally are obvious.

In terms of environmental impacts, it has been calculated that local food production in Beylikdüzü can prevent 350 tons of CO_2 emissions in a realistic scenario (266 ha). The

[5] The calculation is based on the ratio of the Beylikdüzü population (331,525) to Istanbul's population (15,067,724) in 2018. The ratio for 2022 (412835) is based on CO2 per capita.

[6] It was assumed that the food supply of the district from outside emitted 2.73 kilotons of CO_2, and 13% of this was calculated.

[7] The calculation is based on all determined areas meeting 72% of the district's fresh food needs.

Life Cycle Assessment study by Kulak et al. (2013) demonstrates that strategically selected crops and an optimally designed community garden on 26 ha of vacant land in the urban fringe of Sutton, London could reduce emissions by 881 t CO_2e. This assessment considers agricultural activities, distribution, travel to shopping points, and food waste decomposition. Beylikdüzü holds significant potential in this regard; however, the current study relies on basic ratios derived from existing production in Yaşam Vadisi and accounts only for emissions from food transportation between different provinces. Since the analysis is based on the current production capacity of Beylikdüzü, a more efficient crop design could further enhance its impact and contribute to greater emission reductions.

5.3. Comprehensive Food Planning

There are three principal elements of the urban food system: production (supply), distribution (trade), and consumption (demand) (Hsu & Han, 2024). Comprehensive food planning includes food production as well as access to healthy food (Hu et al., 2020), food distribution and logistics (local/short supply chain) (Petruzzelli et al., 2023), food waste management (Parsa et al., 2024), and social innovation (Maye, 2019). This research focuses on the local production aspect of food planning while also attempting to incorporate other components via parameters and sub-criteria. Food access and justice are critical elements that need to be addressed at the household and community level (Opitz et al., 2016), and food availability has been examined in the context of food deserts (Segal, 2010).

Here, Q5 (Proximity to the demographic structure sensitive to food supply) under the Demographics & Population parameter, and Q7 (Proximity to public transportation networks) and Q8 (Access to areas with walking and cycling paths) under Transportation and Accessibility are considered to enhance access to urban agriculture areas. Food storage, although often overlooked, is critical for food security in cities (Hsu & Han, 2024), and food distribution and logistics are associated with the Distribution, Prevention, and Storage parameter. Q12 and Q14 assess the proximity to distribution and storage facilities, while Q13 targets the use of schools and socio-cultural service areas as alternative distribution centers (Appendix 1). The findings reveal that these parameters perform at a moderate level, and socio-economic factors come right after the feasibility of urban agriculture.

Urban agricultural areas are not reduced to a single function but offer social, economic and ecological benefits (Peng et al., 2015). Kavaklı neighborhood will provide recreational opportunities with its proximity to Yaşam Vadisi, while strengthening the green infrastructure of the district. Community-based gardening in Gürpınar-Dereağzı can increase access to nutritious food for disadvantaged groups. Marmara-Kavaklı is a priority intervention area due to its proximity to industrial zones and ecological sensitivity. Although the study focuses on ground-level urban agriculture, rooftop farming, backyard farming, and micro-production can reduce carbon emissions by increasing local food production.

5.4. Implementation and Challenges

Urban food planning encompasses spatial and non-spatial processes; defined food production, processing, distribution and supply policies are shaped by land use plans (Buchan et al., 2018). Although urban agriculture is often considered as a temporary and informal land use, local governments integrate it into planning processes, allowing the use of public lands or the promotion of private property for food production (Meenar et al., 2017). In addition to encouraging short- or long-term rentals on public and private lands, decisions can be made to shape the infrastructure on issues such as the arrangement of structures for urban agriculture, production performance, waste management, etc.

Urban agricultural policies vary for each city; in some, they are firmly integrated into urban planning, but in others, they may remain on a more strategic level. In Italy, Bologna does not select areas when determining implementation indicators, Milan tries to integrate urban agriculture in its newly planned areas, Rome includes it in both plan provisions and zoning, while Turin initially adopted a strategic perspective but integrated it into land use with the revision of the master plan (Forte et al., 2022). In New Zealand, the Christchurch Plan stands out by defining community garden and residential garden allotment (Hanna & Wallance, 2021). In Dawson, Canada, community gardens are permitted in all residential areas and some public spaces, and although urban agriculture is not included in Toronto's zoning, it is seen as the next step in the city's food planning (Huang & Drescher, 2015; Miller & Blay-Palmer, 2018).

To be included in urban food planning, urban agriculture must be supported by regulations and decisions that impact implementation and strategy development. Beylikdüzü district has undeniable driving forces for food production at the local scale. The existence of current food-related practices such as food aid for low-income households and the urban agriculture area in Yaşam Vadisi reveals the district's potential for food planning to develop a sustainable, secure and fair food system. Although there are urban food strategies and initiatives in Istanbul, large-scale decisions such as industrialization, population density and mega projects are restrictive and hindering for urban agriculture.

This study focused on comparing parameters rather than evaluating sub-criteria; various weighting methods may pro-

duce different results, but its compliance with the literature reduces this limitation. In addition, the study provides a basis for future research and suggests a spatial approach for local governments and decision-makers. Sustainable food planning should not be limited to local government policies only, zoning and urban planning laws should be developed as process guides. Future research should focus on more comprehensive methodologies that cover all stages of the food chain. Additionally, the absence of comprehensive data on parameters such as soil erosion and security may have affected the precision of the spatial analysis. Addressing these limitations through the inclusion of more extensive datasets, as well as applying the methodology to a wider range of urban settings, will be critical in future studies to enhance the robustness and generalizability of the findings.

6. Conclusion

This study utilizes the spatial multiple decision-making approach to determine the optimal location for urban agriculture in Istanbul's Beylikdüzü district. It develops an index for site selection based on physical, economic, and social parameters derived from the literature and evaluates this index through a case study. The proposed approach provides an analytical foundation for land-based urban agriculture site selection, offering guidance for local governments, policymakers, and practitioners.

The findings revealed that the most essential parameter for urban agriculture site selection is distance from polluting sources. "Ownership status and land supply" and "transportation and accessibility" also carry significant weight, suggesting that physical conditions take precedence over social and ecological factors. This research offers a transferable model that can be applied across urban settings to inform public land-based agriculture planning and policy-making.

Beyond creating a site selection index, this study uses spatial analysis to identify areas in Beylikdüzü suitable for urban agriculture. Results show that the most suitable areas could meet 13% of the district's fresh food needs, based on the capacity of existing public production sites—an important contribution for a highly import-dependent city like Istanbul. These high-potential areas can support diverse urban agriculture initiatives, including community-based projects, ecological enhancement, and recreational functions. These outcomes align with the economic, social, and ecological benefits attributed to urban agriculture.

Overall, the study integrates built environment, socio-economic, and natural factors into a comprehensive framework for urban agriculture site selection. It offers a spatially grounded method and a foundation for future research in sustainable urban food planning.

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Appendix 1. Parameters and sub-criteria for urban agriculture site selection

Parameters	Definitions	Sub-criteria	Definitions	References
Constraints	Availability of cultivable land.	Q1 Empty field.	The absence of use in the selected area makes the application easier.	area of empty land (He & Genovese, 2012), vacant land parcels (Baker, 2012; Kirnbauer & Baetz, 2012; McClintock et al., 2013), bare groundcover (McClintock et al., 2013), availability of cadaster units (Sonneveld et al., 2021).
		Q2 Field size.	The size of the areas may vary depending on the scope of urban agriculture.	Micro-farming as <500m^2 (0.05ha), family gardens, backyards as <1000m^2 (0.1ha), community farms, and allotments as 1000–3000m^2 (0.1–0.3ha), urban farms as 2000–10000m^2 (0.2–1ha) and suburban farm as >10000m^2 (>1ha) (Yang et al., 2020 community garden as <0.1ha, small market gardens as 0.1-0.4ha, large market gardens, mini-farms as 0.4-2ha, and urban farms as >2ha (McClintock & Cooper, 2010) 0,2 ha- 5,2 ha (Opitz et al., 2016) >0,2ha most suitable, 0,1–0,2ha suitable, <0,1 ha unsuitable (He & Genovese, 2012) Minimum 300 m2 (Kirnbauer & Baetz, 2012).
Ownership status and land supply	Facilitating factors in effective budgeting and implementation .	Q3 Public ownership.	Being in public ownership can make implementation easier and accessible to everyone.	Public lands (McClintock & Cooper, 2010) private and public ownership (McClintock et al., 2013; Opitz et al., 2016; Saha & Eckelman, 2017).
		Q4 Low land value.	Land supply affects the cost. Low land value provides easy supply.	Importance of land value for urban agriculture (Weerakoon, 2014; He et al., 2012).
Demographics and population	To serve the demographic structure and population in need of food access.	Q5 Proximity to demographic structure sensitive to food supply.	Food justice covers ensuring access to more fresh food at the household level.	The percentage of low-income and low-access populations within 1 mile (Smith et al., 2021) percentage of the population at or below the poverty level (Smith et al., 2021). "Healthy Food Priority Areas": average household income, car ownership, availability of healthy food, distance to the nearest supermarket (Baltimore City's Food Environment: 2018 Report, 2018) percentage of the uninsured population (Smith et al., 2021)
		Q6 High population density.	Due to higher population density, more people have access to the food provided by urban agriculture.	Population density and housing density (Weerakoon, 2014) population density within 100m (Smith et al., 2021) distance from urban residential dwellings (Usraoğlu et al., 2021) community garden with min 25 k/ha within 400m, neighborhood farm with min 50 k/ha within 800m, commercial farm, orchards, and farmer's market with min 50 k/ha within 1000m (Kirnbauer & Baetz, 2012).

Appendix 1 (cont.). Parameters and sub-criteria for urban agriculture site selection

Parameters	Definitions	Sub-criteria	Definitions	References
Transportation and accessibility	Fed by different transportation networks, users can reach the area with alternative modes and products can be easily distributed.	Q7 Proximity to public transportation networks.	The proximity to public transportation networks seeks to provide urban agricultural users with convenient access to the site.	Bus or light rail station within a 10-minute walk (Smith et al., 2021) transit bus stop within 400m (McClintock & Cooper, 2010; McClintock et al., 2013).
		Q8 Access to the area with walking and cycling paths.	It improves user access to the area by providing defined pedestrian and bicycle paths.	Bike lane, bikeway, or bike path within 100m (Smith et.al, 2021) Euclidean distance (Sonneveld et al., 2021).
		Q9 Proximity to transportation arteries.	Feeding the area by transport alters provides easy access for users and easy distribution of the food produced.	Road network relationship as high (<1km), medium (1–2km), and low (2–3km) (Thapa and Murayama, 2008) 0.2–3.2km access (Meenar and Hoover, 2012). Fast roads and slow roads (Ustaoğlu et al., 2021). Walking distance from railway and highway if most suitable <500m, suitable 500–1000m, and unsuitable>1000m (He and Genovese, 2012).
Security level	Ensuring the safety of users and products in a controlled environment.	Q10 High security.	The high level of security is influenced by the low number of instances and security issues in and around the region.	Number of thefts reported per district (Sonneveld et al., 2021).
Pollutant sources	To preserve the nutritional value of food, it is important to stay away from pollutants such as industry, ports, etc.	Q11 Distance from polluting sources in land use.	urban soil is damaged by industrial pollution (Saha & Eckelman, 2017).	Five suitability criteria over the soil and groundwater pollution map (Sonneveld et al., 2021). Industrial, port, and airport areas (Ustaoglu et al., 2021). Industrial areas as build-up areas (Thapa & Murayama, 2008; McClintock et al., 2013).
Distribution, prevention, and storage	Proximity between facilities to preserve the nutritional value of food, reduce waste, and manage it effectively during distribution and storage processes.	Q12 Proximity to distribution centers.	Distributed as soon as possible to preserve the nutritional values of the food and to prevent losses.	Accessibility to market areas (Thapa & Murayama, 2008; Baker, 2012; He & Genovese, 2012; Galzki et al., 2017; Smith et al., 2021; Sonneveld et al., 2021; Ustaoglu et al., 2021). Market accessibility over 10–20 and 30 km from the city centers (Thapa & Murayama, 2008). Food supply systems across 2–5 km2 (Galzki et al., 2017). Proximity to market areas is most suitable<500m, suitable 500–1000m, unsuitable>1000m (He & Genovese, 2012). Market areas over 800m (Berger, 2013).

Appendix 1 (cont.). Parameters and sub-criteria for urban agriculture site selection

Parameters	Definitions	Sub-criteria	Definitions	References
				400m radius (Baltimore City's Food Environment: 2018 Report, 2018)100m to commercial areas (Smith et al., 2021).
		Q13 Proximity to social facilities as alternative distribution stations.	Proximity to social facilities such as municipal service areas, schools, and socio-cultural service areas is important for the participation of local people in the process and increasing their access to food.	Schools over 800m (Berger, 2013). 10-minute walking distance to a park, community center, public library, religious institution, or school (Mcclintock & Cooper, 2010). Distance to schools as 400m (McClintock & Cooper, 2010; McClintock et al., 2013).
		Q14 Proximity to preservation and storage areas.	Narrowing production, storage, and distribution distances to shorten the food chain.	Distribution centers and storage areas on large parcels (McClintock & Cooper, 2010; McClintock et al., 2013).
Green system	Proximity of urban agricultural areas to each other, proximity to green areas for holistic ecological infrastructure.	Q15 Integration with the holistic green system within the district.	The presence of green areas will support the ecological system.	>0.3km^2 most suitable, 0.1–0. suitable, and <0.1km2 unsuitable (He and Genovese, 2012). 750–1500m the flying distance of the bees and green infrastructure within 500m (Orsini et al., 2014). 10-minute walking distance (Smith et al., 2021).
Topography	The suitability of the topographic features of the land, including aspect, slope, and drainage.	Q16 Aspect level.	The level of sun benefit during the year, depending on the climatic conditions.	South-facing slopes as a positive criterion for site selection (Baker, 2012; McClintock et al., 2013; Sarı & Koyuncu Sarı, 2021; Ustaoglu et al., 2021). West, southwest, south, southeast, and east as optimal, and northwest, north, and northeast as less desirable (McClintock et al., 2013). At least 6 hours of solar radiation per day (Saha and Echelman, 2017).
		Q17 Low slope.	Slope is one of the indicators frequently used in the selection of urban areas.	Low slope as a positive factor (Baker, 2012; McClintock ve Cooper, 2010; McClintock vd., 2013; Weerakoon, 2014; Saha ve Eckelman, 2017; Smith et al, 2017; Sarı ve Koyuncu Sarı, 2021; Ustaoglu vd., 2021). <10% acceptable, >30% detrimental (Baker, 2012). 10%, 10%–30%, and >30% (McClintock et al., 2013; McClintock ve Cooper, 2010). <5% (Smith et al., 2017). <15% (Saha and Eckelman, 2017). >10% unsuitable (Sarı and Koyuncu Sarı, 2021)

Appendix 1 (cont.). Parameters and sub-criteria for urban agriculture site selection

Parameters	Definitions	Sub-criteria	Definitions	References
		Q18 Drainage suitability.	Water resources are vital for the sustainability of urban agriculture.	Watershed vulnerability (Rogers and Hiner, 2016) close to the water source (Thapa & Murayama, 2008; Baker, 2012; Sonneveld et al., 2021; Ustaoglu et al., 2021). Risk of flooding, surface water availability, groundwater depth (Sonneveld et al., 2021). High (1km), medium (2km), and low (3km) proximity to rivers; high (0.3km), medium (0.6km), and low (0.9km) proximity to ponds/lakes (Thapa and Murayama, 2008). Water source within 3 m (Baker, 2012).
Soil and geological structure	Suitability of geological structure and soil structure.	Q19 Low erosion risk.	The risk of erosion poses a threat to urban agriculture. Geological structure and erosion risk are often the subjects included in upper-scale studies.	Monotonically decreasing linear between 1 and 7 (Usraoglu et al., 2021). Geological suitability on a scale of 1 to 5 (Sonneveld et al., 2021).
		Q20 Agricultural suitability of soil structure	The suitability of soil structure for agriculture is a key component in agricultural sustainability.	Soil suitability in 5 categories (Sonneveld et al., 2021. Soil conductivity, soil depth to restrictive layer, and prime agriculture soil (Rogers & Hiner, 2016). Soil depth, soil limiting factors, and agricultural land capacity on a scale of 1 to 7 (Ustaoğlu et al., 2021). pH, salinity, texture, organic matter (Sarı and Koyuncu Sarı, 2021). Soil types (Parece, 2016).

Planlama 2025;Supp(1):59–73 | doi: 10.14744/planlama.2025.33340

ARTICLE / ARAŞTIRMA

Using SWOT Analysis for Urban Food Planning Focused on Local Governments: Mamak, Ankara

Yerel Yönetimler Odaklı Kentsel Gıda Planlaması için GZTF Analizinin Kullanılması: Ankara Mamak

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ABSTRACT

Today, more than 800 million people out of a global population exceeding 8 billion cannot find sufficient food, and considering climatic extremes, environmental degradation, and economic crises, a bleak picture emerges regarding food systems. The rapid urbanization trend worldwide has led to the intensive use of existing resources and a decrease in food production areas, making urban food planning an important focal point. Many actors are involved in shaping urban food systems. Local governments are in a position to be more effective in the sustainable planning and transformation of food systems compared to other actors. In the case of Mamak District in Ankara, local governments consist of metropolitan and district municipalities. Mamak was a self-sufficient settlement in agricultural terms until the establishment of the Republic but has transformed into a district dependent on the metropolitan city since the 1950s due to the opening of agricultural lands to settlement. In the Mamak district, there are agricultural input support programs, urban agriculture projects, and cooperative formations related to agriculture and food; however, these efforts are far from a holistic framework and action. In urban food systems, analyses of the natural-social-built environment related to the settlement, local government authority-qualification analysis, and the SWOT analysis created within this framework are critical for comprehensive planning. This study has developed a SWOT analysis, one of the cornerstones of a local government-centered urban food system design for Mamak District, which has a population of approximately 700,000 and is largely under metropolitan influence.

Keywords: Food systems; local governments; sustainability; SWOT analysis; urban food planning.

ÖZ

Bugün 8 milyarı aşan dünya nüfusunun 800 milyondan fazlası yeterli besin bulamamakta olup iklimsel aşırılıklar, çevresel tahribatlar ve ekonomik krizler de göz önünde bulundurulduğunda gıda sistemleri konusunda iç karartıcı bir tablo ortaya çıkmaktadır. Dünya genelindeki hızlı kentleşme eğilimi, mevcut kaynakların yoğun bir şekilde kullanılmasına ve gıda üretim alanlarının azalmasına neden olduğundan kentsel gıda planlaması konusu önemli bir odak noktası haline gelmiştir. Kentsel gıda sistemlerinin şekillenmesinde birçok aktör bulunmaktadır. Yerel yönetimler, gıda sistemlerinin sürdürülebilir planlanmasında ve dönüştürülmesinde gıda sistemlerinin diğer aktörlerine kıyasla daha etkin olabilecek bir konumdadır. Çalışma alanı olan Ankara'nın Mamak İlçesi için yerel yönetimler büyükşehir ve ilçe belediyesinden oluşmaktadır. Mamak, Cumhuriyet'in kuruluşuna dek tarımsal anlamda bütünüyle kendine yeten bir yerleşme iken 1950'lerden itibaren tarım topraklarının yerleşime açılması ile metropoliten kente bağımlı bir ilçeye dönüşmüştür. Mamak ilçesinde, tarım ve gıda konusunda yapılan tarımsal girdi destekleri, kentsel tarım projeleri ve kooperatif oluşumları bulunmakla birlikte, bu çalışmalar bütüncül bir kurgudan ve faaliyetten uzaktır. Kentsel gıda sistemlerinde, yerleşime yönelik doğal-sosyal-yapılaşmış çevre analizleri, yerel yönetimler yetki-nitelik analizi ve bu çerçevede oluşturulan GZTF analizi bütüncül bir planlama için kritik önemdedir. Bu çalışmada, yaklaşık 700.000 nüfuslu ve büyük oranda metropol etkisindeki Mamak İlçesi için yerel yönetimler odaklı bir kentsel gıda sistemi kurgusunda temel taşlardan biri olan GZTF analizi hazırlanmıştır.

Anahtar sözcükler: Gıda sistemleri; yerel yönetimler; sürdürülebilirlik; GZTF analizi; kentsel gıda planlaması.

This article was prepared as part of the PhD thesis being conducted by Yağmur Öcal at the Gazi University, Institute of Natural Sciences, Environmental Sciences.

Received: 09.09.2024 Revised: 08.03.2025
Accepted: 13.04.2025 Available online date: 19.08.2025
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TMMOB Şehir Plancıları Odası

1. Introduction

The Global Report on Food Crises reveals how the world is on the brink of a serious food crisis (GRFC, 2024). The causes of this crisis include food waste, lower nutritional value of food, injustices in food sharing, and food production losses due to extraordinary events (floods, droughts, climate change, etc.). As a result of a consumption-oriented lifestyle adopted worldwide, natural assets are rapidly being destroyed and the climate is changing. Climate change has the power to significantly affect food geopolitics, agricultural production, and capital flows in the medium and long term. This exacerbates food system vulnerability, and sustainable transformation of food systems is becoming increasingly important. According to the United Nations Population Fund (UNFPA), more than half of the world's population now lives in cities. According to 2022 World Bank data, 77% of the population in Türkiye lives in urban areas (The Ministry of Environment, Urbanization and Climate Change of the Republic of Türkiye, n.d.).

Cities, which are becoming centers of consumption as they become increasingly detached from food production, are regarded as units that need to be addressed as a priority in the sustainable transformation of food systems, which have a very comprehensive and multiactor structure. "Urban food planning" emerges as the most holistic and inclusive way to ensure the sustainable transformation of food systems. Although transforming food systems through urban food planning is a long and dynamic process, it is the only way to achieve an inclusive, sustainable, and resilient food system in cities. Although many actors need to be involved in the planning of food systems, local government units will be the most effective actors when the criteria of proximity to the public, breadth of authority, sanction power, and ease of implementation are taken into consideration. In Türkiye, local government units comprise special provincial administrations, municipalities (metropolitan municipalities, provincial, district, and town municipalities), and villages. Local governments have the power to organize the food production/consumption/distribution system within their boundaries of responsibility. Adopting agroecological principles that provide a holistic approach in urban food system planning focused on local governments is important for making the process sustainable and resilient. Spatial data analysis and the definition of participation tools are considered the most important components of a sustainable food system planning based on agroecological principles and focused on local governments. Spatial data analysis here refers to the assessment of the current situation in all its aspects, and SWOT analysis (strengths, weaknesses, threats, and opportunities) is an important tool at this point. With SWOT analysis, internal and external factors can be systematically evaluated when analyzing the food systems of cities, which contributes to the strategic orientation of food planning.

2. Conceptual Framework for the Transformation of Urban Food Systems

According to the definition published by the Food and Agriculture Organization of the United Nations (FAO) (2018), "Food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded." According to Şahin (2014), "the concept of food systems covers a wide range of issues from the quantity of food produced to its price, from processing to recycling, from the decisions made by politicians in food-related decisions to the protection of environmental values." The actors in food systems are primarily producers (farmers, fishermen, and shepherds), but also include the central government, local government, the food processing/production sector, retailers, consumers, civil society organizations, the transportation sector, and the finance/insurance sector.

Food systems are fundamentally based on natural resources such as soil, water, climate, and biodiversity and, for food to be sustainable, it is important to use these resources effectively in food systems activities and to consider the ecological pressure that will be created through system activities (Şahin, 2024).

According to Adaman (2022), "when considering the food system as a whole, it is necessary to focus on the protection of natural assets, the environment and the relationship between these topics, taking into account the conceptual framework offered by food security/assurance/sovereignty."

Access to affordable and healthy food is an important problem, especially in big cities. The reduction of agricultural areas within, on the periphery of, and close to large cities due to multiple reasons, especially construction, has negative impacts on food security (Anonymous, 2023).

Globally, food insecurity disproportionately affects women and people living in rural areas. While 27.8 percent of adult women experience moderate or severe food insecurity, this rate is 25.4 percent for men (FAO et al., 2023).

Food is an area that is directly affected by urbanization policies. According to Çaşkurlu (2024), "worldwide, as a result of urbanization, a large urban population has emerged that no longer produces the food it consumes. This is one of the important reasons why the global food system is no longer sustainable. Urban populations are extremely vulnerable to income and food price shocks in order to maintain food security."

Today, the fragility of food systems necessitates transformation and the development of alternative agri-food strategies. One of the most important concepts for the transformation of food systems is agroecology.

The word "agroecology" is a combination of "agro" from agriculture and "ecology" meaning natural science. Blending agricultural and ecological sciences, agroecology is a multidisciplinary field that includes social, political, and social elements as well as being an economic movement (Altıparmak Law Office, 2023).

The 10 elements of agroecology identified by the FAO between 2015 and 2019 are diversity, participatory knowledge, synergies between different systems, efficiency, recycling, resilience, social and human values, nutrition culture, responsible management models, and circular and solidarity-oriented economy (FAO, 2019).

Agroecology involves principles, concepts, and strategies that should underpin a sustainable food production system. These principles, concepts, and strategies are intended to provide a design framework for sustainable agroecosystems rather than prescriptions or blueprints for the construction or management of actual agroecosystems and do not dictate the characteristics of an entire world food system (FAO, 2015). According to Özkaya et al. (2021), "agroecology has the know-how and potential to end all industrial corporate inputs by ensuring biological balance in advanced stages of development."

Accordingly, agroecology can be considered a holistic system that prioritizes biodiversity and locality. According to Karakaya Ayalp (2021), "localized or relocalized food systems can be defined as food systems that aim to produce direct production, distribution, consumption and waste management networks, encourage the use of local resources, reduce intermediary mechanisms, are sustainable and prioritize the social, cultural, etc. values of food."

According to Özkaya et al. (2021, p. 40–41), "In our country, efforts should be made for municipalities to understand agroecology and determine it as a strategy. The formation of alternative food networks provides great support to agroecology. The establishment and support of cooperatives supporting agroecology, municipal and state programs to purchase agroecological products, food groups, community supported agriculture groups and ecological peasant markets are very effective."

3. The Role of Turkish Local Government Systems in Food Planning

There are many actors in the food planning process, including national and international organizations, governments, local governments, civil society organizations, farmers, and consumers. Among these actors, local governments play a key role in building a sustainable food system in a holistic, inclusive, and stable manner.

Local government refers to the administrative units responsible for meeting the needs of local units in a particular region of a country and organizing and administering services. These administrative units comprise special provincial administrations, municipalities (metropolitan municipalities, provincial, district, and town municipalities), and villages. The relations between central government and local government are regulated in detail by the 1982 Constitution (IPA, n.d.).

Within the framework of the authority granted by the Constitution, the establishment and boundaries, duties, powers and responsibilities, organs, organization, revenues and expenditures, budget, and borrowing and economic activities of municipalities are regulated in Municipality Law No. 5393 enacted in 2005. Article 4 of Law No. 5393 states that "Municipalities may be established in settlements with a population of 5000 or more. It is compulsory to establish municipalities in provincial and district centers".

The main duties and responsibilities of the municipality are explained as follows (Article 14 of Municipal Law No. 5393) "Provide or have provided urban infrastructure; geographical and urban information systems; environment; emergency aid; urban traffic; burial and cemeteries; green areas; housing; culture and arts; social services and assistance; development of economy and trade services." The same article also states that municipalities can carry out maintenance, repair, protection, and food banking activities.

With the Metropolitan Municipality Law No. 6360, which came into force in 2012, metropolitan municipalities were established in provinces with a population of 750 thousand or more, and special provincial administrations, which until then had been local government units specialized in providing services to rural areas, were abolished. Villages and town municipalities in these provinces were transformed into neighborhoods. With the abolition of special provincial administrations, the responsibilities for all services in rural areas were transferred to metropolitan municipalities, creating a need for rapid organization in these municipalities. Following Law No. 6360, metropolitan and district municipalities have carried out various activities involving agricultural support and training.

However, since the implementation of this law, as explained in detail in Yıldırım and Yücel Işıldar's (2014) article "An Ethical and Ecological Examination of Law No. 6360", a negative transformation has occurred and many natural elements of village life have started to disappear rapidly within these "urbanized" areas. Compared to urban life, village life, which has elements such as a more self-sufficient and productive way of life that moves along with the natural structure, the diversity of local seeds, a system that produces less waste in which everything is utilized, the use of land for agriculture and animal husbandry, and being content with less energy, has changed in a short period of 10–12 years, making those living there much more consumerist, while natural areas and agricultural areas have become victims of the rent system.

Local governments are more effective institutions than the central government in ensuring local participation and realizing local entrepreneurship. The reason for this is that local governments are the organizations that have a say in the local area, that have all the information about the local area, and that serve as the units closest to local communities (Bilgin, 2002).

Land use planning, which is among the service areas that municipalities are authorized to fulfill, is directly determinative of the present and future status of food production areas, and this reveals the importance of local government units in the construction of the food system.

Although grassroots organizations and movements play an important role in initiating a sustainable food system, the role of local governments is fundamental to create a structure that directs the food system in a holistic, inclusive, and stable sustainable direction (Karakaya Ayalp, 2023).

According to a study conducted by Kazancı in 1983, "In its current position, local governments are bystanders in the regulation and supervision of consumption in cities. Municipalities have no role in the transportation, marketing and distribution chain of consumer goods from the producer to the consumer. Food pricing is completely outside the purview of local governments. What local governments should do here is to initiate initiatives that will provide additional resources." Considering today's conditions, it is clear that this situation continues.

According to Keleş (2020, p. 165), "Local governments cannot fulfill the political functions expected of them unless they are elevated to a situation where they are accountable to the public and open to the constant control of the public."

In many cities around the world, urban food policy councils are established at the local level to produce food policies and plans that integrate the city with nature and its inhabitants (IMM, 2021). In addition, food strategy documents are organized by local governments to set up a long-term framework for food.

Today, one of the most important steps that Turkish local government systems can take for urban food planning is to implement a city-region food system toolkit. As explained in detail in the study by Yarış and Karakaya Ayalp (2023), the Regional Food System Toolkit has been developed for the sustainable transformation of urban food planning. The urban–regional food system toolkit is based on mapping and defining this food system. Defining it involves answering the questions: "Who feeds the urban region, where is food processed, how is it marketed, how do people access food, what is the current situation in terms of food security, how is food waste managed, and who are the government and institutional actors involved in the food system?"

According to Dury et al. (2019), "food systems are of strategic importance for inclusive development." When planning the food system, it is necessary to develop a holistic perspective as well as an assessment within the framework of strategic development plans.

3.1. National and International Regulations on the Position of Local Governments in Food Planning

At the Food Systems Summit organized by the United Nations, five main action areas were identified within the scope of 2030 Sustainable Development Indicators (UN, 2021). These are the following:

Action 1: Ensure access to safe and nutritious food for all.

Action 2: Transition to a sustainable consumption model.

Action 3: Increase nature-friendly production on a sufficient scale.

Action 4: Promote just livelihoods.

Action 5: Build resilience to vulnerabilities, shocks, and stresses.

In line with the UN targets, Türkiye prepared the "National Food Systems Roadmap" in 2021. The Roadmap was prepared within the scope of the United Nations 2030 Sustainable Development Indicators and includes how food systems will be transformed to meet sustainable development goals and what needs to be done in Türkiye for this transformation. In the National Food Systems Roadmap, a total of 10 priority targets have been identified within the United Nations action areas. Actions are determined to achieve each goal.

These action areas, targets, and actions that are deemed important to be taken within these areas can be summarized as follows:

Action 1 refers to three main elements in the food system. These are the right to food, the right to clean water and sanitation, and the right to nondiscrimination. In Action Area 1, the most problematic areas are identified as lack of education on conscious nutrition, low efficiency and effectiveness in production processes and products, lack of consumer awareness and therefore lack of awareness on healthy food consumption, insufficiency of some nutrients and the obesity problem, and controlling food prices. Some of the prominent action proposals related to these problems are expanding urban agriculture, raising awareness on food literacy, supporting the use of technology to increase food fortification, investigating regional nutrient deficiencies, raising awareness in food preparation and consumption, preventing losses, and increasing lifelong education opportunities in society.

The problematic areas highlighted in Action 2 are the lack of awareness on safe and nutritious food, the mismatch between producers and consumers in the value chain, the need to improve monitoring systems for food safety, and information

pollution in this area. The proposed actions are as follows: preventing information pollution about healthy and nutritious food, raising consumer awareness, improving food labeling practices, monitoring the greenhouse gas emissions and water footprint of products, increasing biodiversity, introducing public deterrent and incentive systems to prevent waste, recycling food waste for use in pet food or pharmacology, refining organic production, food banking practices for the transformation of the national food system, and adopting a "produce locally and consume locally" approach to deliver surplus food suitable for human consumption to those in need.

Action 3 involves the increasing amounts of food loss and waste due to the lack of digitalization and smart agriculture techniques in the agri-food value chain, inefficient use of natural resources, and lack of efficient land and production planning. In this context, the proposed solutions include the dissemination of geographical information systems and smart agriculture practices, supporting farmers to use smart agricultural techniques, enacting a water law and increasing water efficiency through the use of technology, disseminating climate-friendly agricultural practices, protecting genetic resources, and updating curricula for the efficient use of natural resources and adoption of sustainable food systems in higher education.

Action 4 involves highlighting inequalities in agriculture among migrant and indigenous peoples, women, children, minorities, young people, and seasonal workers. It is important that natural resources are distributed more equitably, taking vulnerable groups into account. The more people from low-income or socially excluded groups have opportunities, the more perfectly food systems are considered to work. Stabilization of food prices will help vulnerable groups that are negatively affected by high prices. The transition from production patterns to consumption also brings some challenges. In this context, recommended actions include structural changes that can be expected for food systems, more inclusive policies for agri-food sector workers and working towards equitable access to and use of relevant technology.

Action 5 is an action area to improve urban area food systems, helping people, especially vulnerable people, to access affordable and nutritious food, enabling access to farmers' markets and local and regional hubs to be established, and shortening the supply chain. Meetings about this area also emphasized the importance of actions to build the resilience of small farmers and smallholders for a sustainable food system approach. For these specific target groups, actions such as informing and educating farmers about shocks, raising awareness through locally based research and training programs, and public–university cooperation are proposed.

Again, regarding this action area, the National Roadmap Action List includes the action of "Establishing the Resilience of Food Systems against Climate Change, Natural Disasters, and Unexpected Crises" within the target of "Establishing regional food systems based on Urban Agriculture (Urban Food) for both reducing carbon footprint and participating in food supply/value chains in a stable manner and ensuring the integration of these systems with national and global food systems." In this context, a monitoring and evaluation process will also be carried out to determine whether the National Roadmap has established or increased the resilience of food systems at the local level. Among the responsible and implementing institutions for this action are the relevant policy-making and implementing institutions acting at the regional level, relevant provincial directorates, development agencies, and provincial and district municipalities (The Ministry of Agriculture and Forestry of the Republic of Türkiye, 2021).

4. Examples of Milan and FUSILLI Project in Local Government-Oriented Food Planning

Today, many cities are preparing urban food strategy documents and implementing holistic food planning practices. In the present study, Milan and the FUSILLI Project were selected based on the criterion that food system planning should be "local government-oriented."

4.1. Milan Urban Food Policy Pact and Milan Food System Report

In Italy, which has a very long history, municipalities provide certain administrative services to the inhabitants of the municipal territory, as required by a law passed in 2000. For example, municipalities are authorized to carry out land-use planning and all other responsibilities and duties not delegated to other authorities by State and Regional Governments through legislation. Each municipality has a Mayor and Assembly elected directly by the people, and an Executive Committee whose members are elected by the Mayor (Keleş, 2020, p. 136).

In 2014, the then Mayor of Milan launched the Milan Urban Food Policy Pact (MUFPP), the aim of which is to address food-related issues at the urban level. The Pact is based on the role of cities in the development of sustainable food systems. In 2015, more than 100 cities signed the Pact in Milan, which includes 37 proposed actions. The Milan City Council has allocated a budget for piloting the proposed actions and has organized various technical activities (MUFPP, n.d.).

The projects and practices carried out by the MUFPP within the framework of 6 actions are in the areas of social and economic equality, governance, sustainable diets and nutrition, food production, food supply and distribution, and food waste. Today, 280 cities from 84 countries are members of the Pact, with Mersin Mezitli Municipality, Aydın Efeler Municipality, Istanbul Metropolitan Municipality, Bursa Nilüfer Municipality, and Antalya Muratpaşa Municipality from Türkiye.

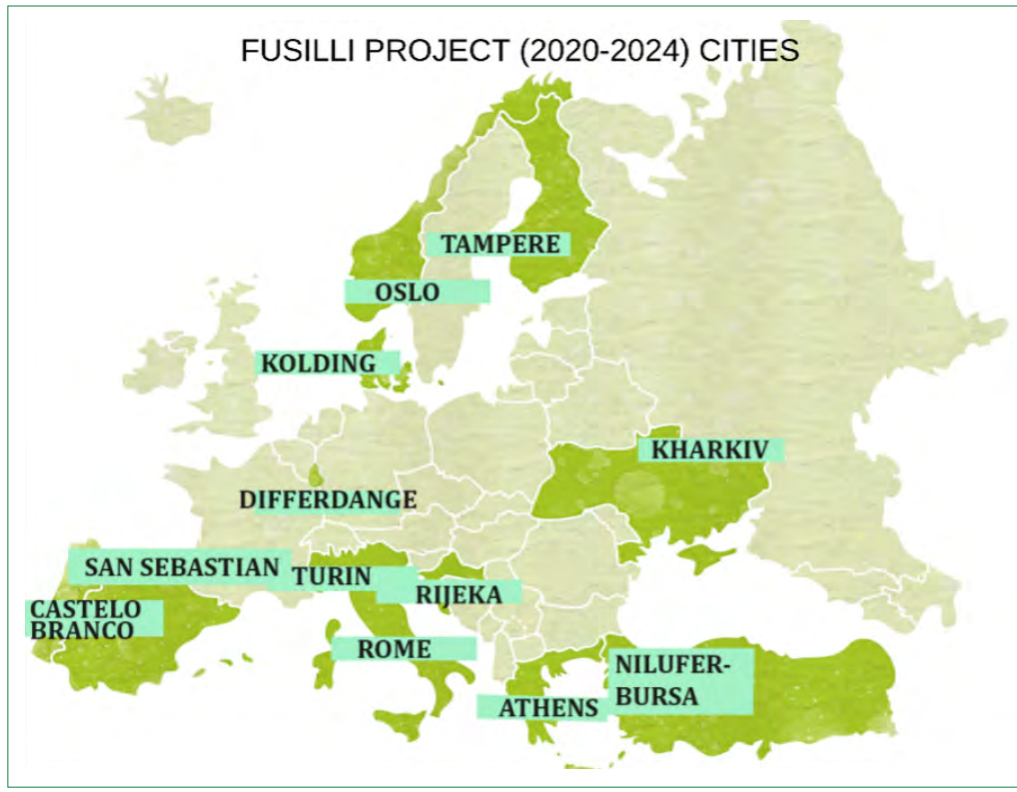

Figure 1. Cities in the FUSILLI network.

Source: https: fusilli-project.euabout.

For Milan, which pioneered the MUFPP, the report "The Food System in Milan" was prepared in 2018, in which the following five priorities for sustainable development were identified (The City of Milan, 2018):

- Providing healthy food and water for all citizens: This includes ensuring that all citizens have access to healthy food and water to protect personal dignity and improve quality of life.
- Promote the sustainability of the food system: This includes promoting local production and consumption of quality fresh and seasonal foods for a sustainable food system.
- Promote food education: This refers to promoting a culture of consumer awareness of food that is sustainable, healthy, safe, and culturally appropriate in terms of human rights and the environment.
- Tackling food waste: Reducing surpluses and food waste at different stages of the food chain as a way to prevent social and economic inequalities and as a means to reduce environmental impact.
- Supporting scientific research in agri-food sectors: Milan stands for promoting the development of agri-food scientific research, improving processes and technological development.

In 2018, the "Metropolitan Food Council" was established in Milan in order to generate ideas and policies for the city's holistic food system and implement them. The Council represents a common space where civil society, academia, the private sector, and institutions can exchange ideas and consult with each other.

4.2. FUSILLI Project (2020–2024)

The main objective of FUSILLI (Fostering the Urban Food System Transformation through Innovative Living Labs Implementation) is to overcome barriers to the development and implementation of integrated food policies that support the transition to sustainable food systems in urban, peri-urban, and nearby rural areas. To achieve this goal, FUSILLI has engaged 12 cities in a knowledge sharing and learning network to address the challenges of food system transformation. These cities are shown in Figure 1.

According to the project, each city will develop a "Living Lab" as an open innovation ecosystem with the goal of implementing different innovative actions at all stages of the food chain, including production and processing, distribution and logistics, consumption, food loss and waste, and management. Supported through the FUSILLI Knowledge Community and through urban food plans, partners will identify existing best

Figure 2. Location of Mamak district in Türkiye and Ankara.

practices and thus support participating Living Labs, related initiatives, and policy makers in the development of sustainable food systems (FUSILLI, n.d.). Funded as part of the European Union's Horizon 2020 Research and Innovation Program, FUSILLI covers the period 2020–2024.

The aim of the FUSILLI project is to improve operations at all stages of the food value chain. These priorities are the following (Nilüfer Municipality, n.d.):

- Foods for sustainable and healthy diets,
- Climate and environmentally sustainable food systems,
- Circularity and resource-efficient food systems,
- Innovation and empowerment of communities.

The FUSILLI project involves all kinds of actors, policies, administrations, and different functions in research and policy work, not only all relevant processes.

5. Spatial Data Analysis on Mamak's Food System

The existing data on the food system for Mamak, the study area, was largely obtained from Mamak Municipality and Mamak District Directorate of Agriculture and Forestry. Within the scope of the study, data on plant and animal assets, field cultivation rate, and number of enterprises were obtained from the District Directorate of Agriculture and Forestry officials. Mamak's geographically marked products, natural assets, zoning plans, agricultural support, and farmer surveys were obtained from Mamak Municipality. The last step of the spatial data analysis, the food deserts synthesis, was prepared by considering built-up areas, supermarket and local market locations, and edible landscape areas.

5.1. Mamak's Location

Mamak District is located in the eastern corridor of Ankara and is surrounded by Elmadağ District to the east and south, Çankaya District to the west, and Altındağ District to the north. Figure 2 shows the location of Mamak District in Türkiye and Ankara.

Mamak is one of the districts of Ankara most migrated to and is a district where urbanization is continuous and urbanization is continuous and urbanization takes place in a disordered manner, especially in slum areas, and, as a result of this, there are old settlements that have suffered considerable destruction.

While the district had a total of 56 neighborhoods until 2004, in 2004, in accordance with the Metropolitan Municipality Law numbered 5216, five village settlements (Gökçeyurt, Kıbrıs, Kızılca, Kusunlar, and Ortaköy), which were within the borders of Ankara Metropolitan Municipality and whose village legal status was abolished with the Ankara Metropolitan Municipality Assembly Decision No. 531, were added to Mamak District to make a total of 61 neighborhoods. Later on, in 2008, in accordance with the Law on the Establishment of Districts within the Metropolitan Municipality Boundaries numbered 5747, Kutludüğün and Lalahan municipalities, which were first stage municipalities, were connected to Mamak Municipality as neighborhoods, resulting in a total of 63 neighborhoods, making it the fourth largest district of Ankara in terms of density (Çakmak, 2016).

According to the information obtained from the District Directorate of Agriculture and Forestry, barley, wheat, chickpea, etc. are produced in Mamak and agricultural activities are carried out in neighborhoods with a highly rural character.

5.2. Mamak's Local Government Structure

In 1984, the first municipal elections were held in Mamak, which was separated from Çankaya District with the Law on the Establishment of Six Districts and the Abolition of the Central District of Ankara Province adopted on November 29, 1983. Since 2008, villages have become neighborhoods and the towns of Kutludüğün and Bayındır have been included in the district.

The local government units in Mamak consist of Mamak Municipality and Ankara Metropolitan Municipality.

5.3. Climate

A continental climate prevails in Mamak District. Winters are rainy and cold, while summers are dry and hot. The hottest months are July and August and the coldest month is January. Precipitation comprises snow and rain in winter and rain in spring and fall. The average annual precipitation of the district is around 360–420 kg/m^2. Despite the southern slopes of the district, snowfall is higher on the northern slopes. Especially on the northern slopes of Elmadağı, snow thickness is over 30 cm according to the year. The average annual wind speed in Ankara is around 1.7 m/s. When analyzed according to the number of gusts, it is seen that north winds are dominant (Erdoğan, 2015).

5.4. Crop Production/Land Assets

While 66,781 da of the 308,000 da of land in the district is used for agricultural purposes, the area that is suitable for agriculture but cannot be used is 1679 da.

5.4.1. Land Use in Crop Production

According to the data obtained from Mamak District Directorate of Agriculture and Forestry, 57,858 da of agricultural land is used for the production of field crops, 227 da for vegetables, 748 da for fruits, 14 da for greenhouse cultivation, and 7 da for outdoor ornamental plants, while 7927 da of land is left fallow. In the district, 813 da of agricultural land can be irrigated.

5.5. Mamak's Geographically Marked Products and Ecological Assets

Two products specific to Mamak have geographical indications. The sourdough bread of Kutludüğün and Mamak Ravak yogurt, which were registered with the initiative of Mamak Municipality, have provided an important added value for the district to promote its local flavors. The marketing of geographically marked products is mostly carried out by the Mamak Women's Cooperative (MAKKOP).

5.5.1. Kıbrıs Valley

Located in Mamak, Kıbrıs Valley is a natural asset. It is located 25 km from Ankara city center and 12 km from Mamak district center. In 2020, Mamak Municipality prepared a conservation zoning plan to protect the ecological quality of the valley, which is a 3rd degree natural protected area, and to create a nature tourism area.

5.5.2. Gökçeyurt Ecological Valley

In Mamak, the District Municipality has implemented an ecological valley project focused on ecological food production starting in 2020. With this project implemented within the borders of Gökçeyurt Neighborhood in Mamak, an "ecological village" with a vegetable planting area, fruit tree planting area, training workshops, greenhouse, bakery, seed warehouse, and local products sales block was built on an area of approximately 25 decares; a lavender garden on an area of approximately 25 decares; and afforestation activities, aromatic plant cultivation, a cherry garden, and a strawberry garden on an area of approximately 66 decares. Our design study showing the locations of the uses in the project is given below (Fig. 3).

There is a lavender garden on an area of 25 decares in the ecological valley. Lavender, which uses water sparingly and grows on barren soils, also ensures the protection of soil and water resources (Öcal & Ercoşkun, 2021). It was learned that the fruits and vegetables produced in the ecological garden in Gökçeyurt, are used in the municipal cafeteria and as social aid. According to data obtained from the district municipality, a total of 6283 kg of tomatoes, 252 kg of beans, 926 kg of zucchini, 409 kg of peppers, and 1800 kg of cucumbers were harvested in Gökçeyurt Ecovillage in 2023. There are approximately 200 local species in the seed warehouse in the ecological valley, where children are given training to instill the importance of traditional seeds.

5.6. Mamak Farmer Surveys (2023) and Agricultural Support

Within the scope of the Mamak Rural and Local Development Strategy prepared by Mamak Municipality in 2023, it was aimed to determine the deficiencies in the current agricultural practices through farmer meetings and survey applications in nine rural neighborhoods where agricultural production takes place in the district.

When the section "Your opinions and suggestions for the development of agriculture and animal husbandry and increasing the welfare levels of farmers," which was asked to the 98 farmers surveyed, is examined, it is seen that the demands are mostly about the need for training, equipment, and technical support and the removal of construction pressure in agricultural areas:

- Increased training and financial support for the development of agriculture and animal husbandry,
- Regional farmers generally support solutions for the spreading of solid fertilizers,
- Support for solid fertilizer machines because they think that they cannot spread solid fertilizer homogeneously in agricultural areas,
- Support for stone collecting machines for field preparations, as it is difficult to sow in stony fields,
- Support for overwintering (food) and beekeeping products to be used during the season for people engaged in beekeeping,
- Demands for agricultural consolidation,
- Supporting young farmers,
- Increasing the amount of support as farmers are struggling with increasing fertilizer and diesel prices,

Figure 3. Ecological valley project.

- Increasing herd managers,
- Removal of hobby gardens from agricultural areas,
- Prohibiting the development and sale of grazing areas (meadows and pastures), which are important for livestock breeding, and protecting these areas by rehabilitating them,
- Establishing the necessary technical infrastructure for soil analysis in the district or supporting the analysis,
- Producing products suitable for the soil and climate and providing guidance on appropriate fertilization, spraying, and seed selection,
- Veterinary support for those engaged in animal husbandry,
- Providing the necessary support for livestock activities to be carried out in more organized areas.

The District Municipality also provides agricultural and livestock support to farmers who are actively engaged in general support programs in Mamak District. According to data from Mamak Municipality's Rural Services Directorate,

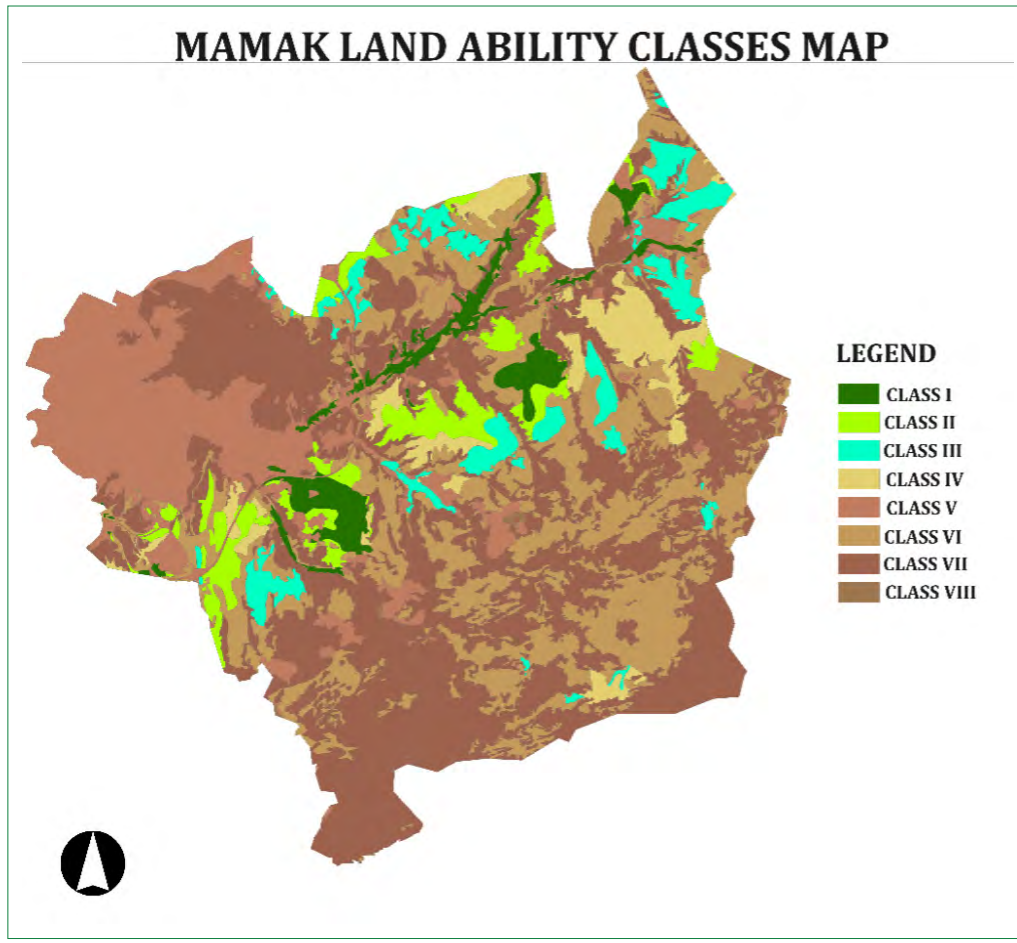

Figure 4. Mamak land capability map.

Source: Created using ArcGIS program.

the District Municipality provided 90% grants for seedlings, hives, chickpeas, wheat, laying hens, and fertilizers in 2022 and 2023. Ankara Metropolitan Municipality, another component of Mamak's local government, has also provided agricultural and livestock support to farmers, but in a more comprehensive manner than Mamak Municipality (Ankara Metropolitan Municipality, n.d.).

5.7. Mamak's Soil Capability Classes and Zoning Plans

Mamak consists of rugged, plateaus (including high ones), narrow and steep valleys, and high altitude hills. In the valley of Hatip Stream, there are partial broad-based plains with alluvial soil. This is where the fruit and vegetable gardens of Ankara were located 40–50 years ago. The Kayaş, Üregil, Mamak, and Gülviran orchards have met the fruit needs of Ankara for centuries. Over time, these vineyards and orchards were opened up for development and dense urbanization began in the region, and the land lost its characteristics (Erdoğan, 2015).

Based on the 2023 Capital Ankara Master Plan, soil characteristics, topography, climatic conditions, current irrigation status, and land use in Mamak district have been classified. The land was divided into four groups and its characteristics are as follows:

Important agricultural land in the first degree is absolute agricultural land. This includes class I and II land and irrigated gardens, and all irrigated agricultural land with sufficient water in other classes. In class I and II land, the soil is generally deep enough to grow various plants. Soil temperature and reaction are favorable for the growth of cultivated plants. Soils are not subject to frequent flooding during the growing season. Due to intensive construction, this type of soil has only partially remained around Kusunlar, Kayaş, Kıbrıs, Kutludüğün, Bayındır, Kızılcaköy, Odabaşı, Ortaköy, Gökçeyurt, Yukarı İmrahor, and Lalahan.

Grade III important agricultural land includes nonirrigated vineyards and gardens and special crop land. There is class III agricultural land in the settlements around Kusunlar, Kıbrıs, Kutludüğün, Bayındır, Üregil, Kızılcaköy, Ortaköy, Odabaşı, Gökçeyurt, and Lalahan.

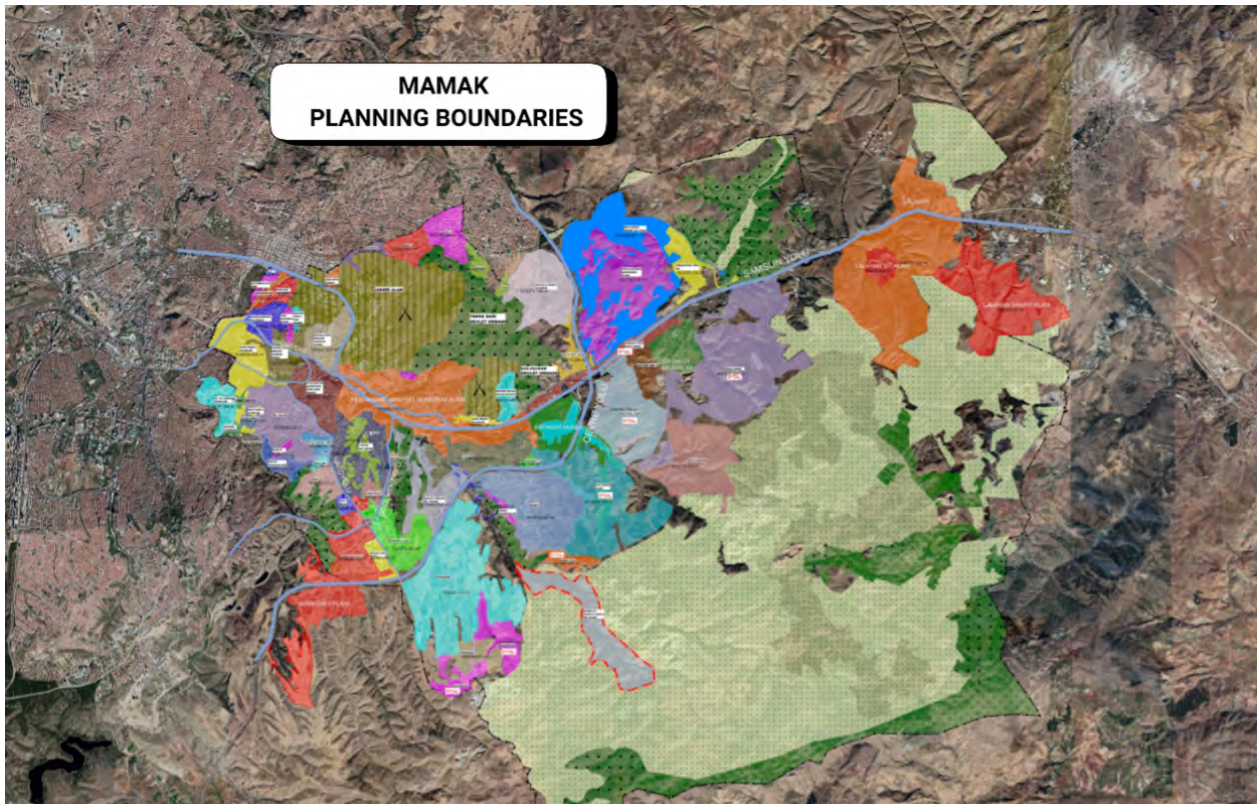

Figure 5. Mamak municipality, Mamak zoning plan boundaries by 2023.
Source: Mamak Municipality.

Mamak, which has a total surface area of 30,800 ha, has 6600 ha of agricultural land. Of this, 1200 ha is class I, 1600 ha is class II, and 1600 ha is class III. Although these agricultural areas are currently protected, it is understood that some of the zoning plans in progress cover these areas.

Based on the above information, the "Mamak land capability map" (Fig. 4) was created using the software ArcGIS. Mamak Zoning Plan Boundaries (Fig. 5) were obtained from Mamak Municipality Directorate of Zoning and Urbanization.

In 2023, Mamak Local and Rural Development Strategy was prepared by the District Municipality with the objectives of developing local values in rural parts of Mamak on the axis of sustainability and increasing the opportunities for all segments of society to benefit from ecological services and opportunities. The plan has eight strategic purpose and 39 targets related to these purposes. It is understood that the zoning plans prepared in Mamak are fragmented in terms of scope and history. Figure 5 shows the zoning plan boundaries in force for Mamak.

When the regional plan for Ankara Province and the 2038 master development plan approved by the Ankara Metropolitan Municipality, one of the local government bodies of Mamak District, are examined, it is seen that the food issue is approached from a fragmented perspective and has a superficial and production-oriented approach only at the level of protecting agricultural areas (1,200,000 ha). Although there are some alternative food networks, community-supported agriculture projects and agricultural projects operating at the Ankara scale, there is no system in which these formations are organized within a holistic plan.

5.8. Food Deprivation Zones

A map of food deprivation zones was obtained by mapping food sales areas, local markets, and edible landscapes in Mamak. This map was prepared to create a general view of the levels of access to food in Mamak and is not very detailed or comprehensive. According to this map, Region 1, the urbanized area of Mamak with the highest population, is identified as food deprived. It is seen that there is only one edible landscape area in this region. Zone 2 is a semirural area with a much lower population density, where the number of local markets is inadequate. In Region 3, which covers the rural areas of Mamak, it is seen that the edible landscape areas have been increased with the "ecological valley project" implemented by the District Municipality, but the number of local markets (farmers'

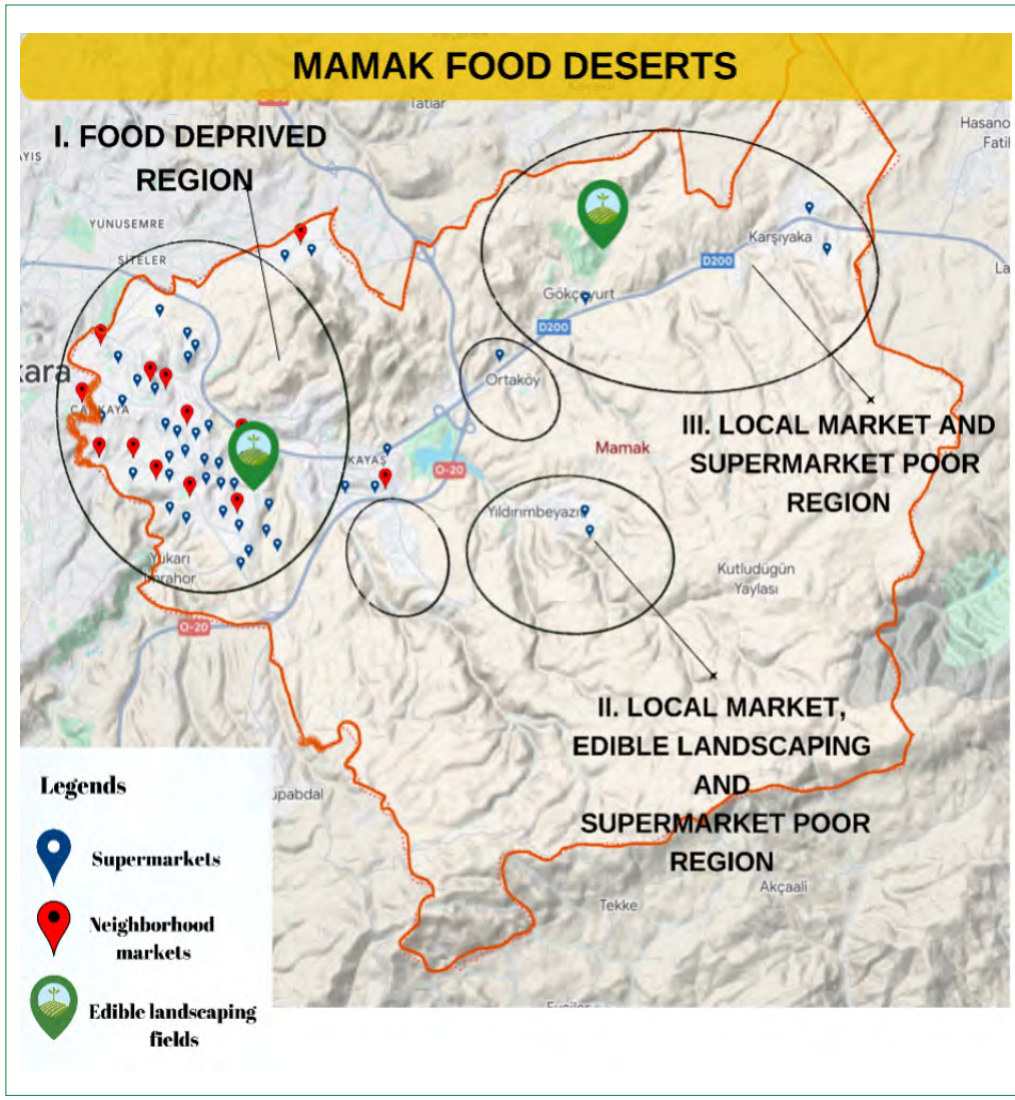

Figure 6. A general forecast diagram regarding the food deserts in Mamak.

Digitized using Adobe Photoshop program according to the data obtained from various analyses and field studies.

markets) is insufficient. The identified Mamak food deprivation zones are shown in Figure 6.

In Mamak, Google Earth was used for location-based analysis of food sales units and wholesale and retail units, while the locations of local markets and edible landscaping areas were obtained from the Municipality.

6. SWOT Analysis and Food Systems

SWOT analysis is a strategic method used to understand the current state of any project or organization, develop strategies, and manage risks. SWOT stands for strengths, weaknesses, opportunities, and threats. A holistic urban food system planning requires a detailed presentation of data on the city's agri-food system, and SWOT analysis is considered a valuable tool to achieve a unique synthesis within this framework.

6.1. SWOT Analysis in terms of Mamak's Food System

SWOT analysis was conducted to detail the current situation for the components of Mamak's food system. In the present study, spatial data analyses, survey data, data obtained from one-to-one interviews, and data obtained from field studies for Mamak District were used. The aim of the SWOT analysis is to ensure that all factors related to Mamak's food system are appropriately identified. When planning a local government-oriented food system in Mamak, using SWOT analysis as a basis will make the process effective and holistic. SWOT analysis will help identify the strategic objectives and roadmap for holistic food system planning in Mamak. While strengths and opportunities can be used to guide food planning, it is also possible to make strategic decisions by addressing weaknesses and threats.

The strengths related to local government identified in terms of the food system in Mamak are as follows:

- S1: Existence of geographically marked products registered to Mamak Municipality, (Kutludün Sourdough Wood Oven Bread and Mamak Ravak Yogurt),
- S2: High interest in the "Introduction to Permaculture" training given by Mamak Municipality for rural neighborhoods,
- S3: Beekeeping training provided by Mamak Municipality for rural neighborhoods and beehive support for those who received training,
- S4: Subsidies for farmers (wheat, chickpeas, seedlings, chickens, hives, and diesel),
- S5: High plant diversity in the ecological valley in Gökçeyurt Neighborhood,
- S6: Beekeeping practices in the ecological valley in Gökçeyurt Neighborhood,
- S7: Training for children on seeds, bread making, vegetable drying, etc. given in the training workshops in the ecovillage,
- S8: Seed warehouse in the ecovillage, where approximately 200 types of ancestral seeds are kept,
- S9: Practices of the current local government structure that contribute to sustainability (ecological valley project, ecology-based training, etc.),
- S10: Mamak Sustainable and Local Rural Development Plan prepared by the Municipality.

Strengths identified in terms of the food system in Mamak that are not directly related to local government are as follows:

- S1: The region has the necessary climatic conditions and soil structure for agriculture and ovine husbandry,
- S2: Institutions and organizations related to the development of agriculture and animal husbandry are in cooperation with farmers,
- S3: Farmers are willing to engage in the practices to be implemented for the development of agriculture and animal husbandry.

The opportunities related to local government identified in terms of the food system in Mamak are as follows:

- O1: Proximity to the market for the producer's evaluation of products,
- O2: Cyprus Valley with high rural tourism potential,
- O3: The areas within the ecological valley in Gökçeyurt Neighborhood have a high agrotourism potential with uses such as the lavender garden, cherry garden, strawberry garden, aromatic plant garden, and ecovillage,
- O4: Endemic plant presence in the region (Prangos denticulata),
- O5: The existence of a women's cooperative in Mamak that facilitates the marketing of agricultural and animal production (MAKKOP).

The weaknesses related to local governments identified in terms of the food system in Mamak are as follows:

- W1: There is no live animal market or mobile slaughterhouse in the region,
- W2: Inefficient animal husbandry in the region,
- W3: Inadequate and incorrect reclamation works in Hatip Stream,
- W4: Not all farmers have adopted good agricultural practices,
- W5: Failure to spread cattle manure,
- W6: Lack of rural design guidelines,
- W7: Lack of supervision leading to the proliferation of hobby gardens on arable land,
- W8: A food-poor region and local market- and supermarket-poor regions identified in the food deserts synthesis.

Weaknesses not related to local governments were identified as follows:

- W1: Development of food pricing completely outside local government,
- W2: Insufficient number of animal herd managers,
- W3: Large amount of nonirrigated land in the region,
- W4: Multishare ownership of land,
- W5: Limited financial literacy of farmers and limited knowledge of new production techniques.

The threats related to local governments identified in terms of the food system in Mamak are identified as follows:

- T1: Agricultural land under urbanization pressure,
- T2: Insufficient grazing areas due to the decrease in pasture areas,
- T3: Nonparticipatory development planning processes,
- T4: Inadequate control of solid and liquid waste in the area,
- T5: Rapid disappearance of natural elements (plant and animal species, natural habitats) in the area due to various human activities (agriculture, uncontrolled animal husbandry, construction, roads, quarries),
- T6: Negative impacts of quarries on the environment,
- T7: Development pressure on agricultural areas,
- T8: Unconscious and excessive use of groundwater.

Threats not related to local government were identified as follows:

- T1: Impending food crisis,
- T2: Farmers' production and incomes are not stable,
- T3: While the cost of inputs required for farmers' production increases, the products are not valued at the same rate.

7. Evaluation and Conclusion

Food systems are complex and multiactor in nature. Today, the world is facing a food crisis that is becoming increasingly evident. This situation underscores the importance and necessity of sustainable and resilient food planning in urban areas. The Türkiye National Food Systems Roadmap, prepared in accordance with the UN 2030 goals, includes targets for the transformation of food systems. Local governments, which derive their authority from central administration and operate within the limits set by laws, play a key role in the transformation of food systems. Food security, which is one of the most important requirements of sustainable food systems, is threatened by the reduction of agricultural land, and local governments are largely decisive in the protection of agricultural areas. When considering the conditions in Türkiye, the greatest contributions that municipalities can make to the food system are establishing food councils, implementing urban food laws, and creating food strategy documents within the framework of comprehensive analyses and planning. As for practical actions that can be taken within the defined food urban regions, the initial steps could include establishing farmers' markets based on agroecological principles to eliminate intermediaries, collaborating with alternative food networks, and promoting urban agriculture practices. Collective urban gardens, which will be realized by evaluating suitable areas within the boundaries of municipalities, can also contribute to the acquisition of sustainable living habits through "ecological farming" training provided to citizens. It should be remembered that urban agriculture, while being a series of practices that go beyond food cultivation and support a culture of shared living, is only one component of food planning. The establishment of City Food Councils is critical for the governance aspect of a sustainable food system framework for municipalities. Additionally, promoting products with geographical indications or introducing new geographical indication products, as well as disseminating these products through producer organizations, are also important actions that local governments can undertake.

The study area, the Mamak District of Ankara, is a settlement under the influence of the metropolitan city and is subjected to zoning pressure. The shrinking agricultural land is reducing the district's self-sufficiency rate at an accelerating speed, and it is seen that the zoning plans made do not take into account the balance of food supply and demand. At this point, the need for a sustainable urban food system framework that adopts agroecological principles emerges. Protecting and maintaining the health of ecological systems and adjusting agricultural, livestock, housing, and distribution systems while considering soil, water, and air pollution is one of the most sensitive issues regarding obtaining food in rural areas in a sustainable way. In Mamak, it is seen that the urban agriculture projects implemented by the district municipality are not considered in connection with the overall zoning plan or food production areas of Mamak. In general, in this country, there is a fragmented approach, and studies that remain at the level of "urban agriculture practices" need to be integrated into spatial plans; a clear and holistic management plan needs to be established. It appears that local government in Mamak does not exhibit a holistic conceptual understanding or an agroecological perspective for the agriculture and food sectors. The Mamak Local and Rural Development Strategy prepared by Mamak Municipality in 2023 is an important step for holistic sustainable development and rural/urban integration, but the actions included in this plan need to be implemented. While there are some efforts towards the formation of alternative food networks, it is clear that there is a deficiency, especially in establishing farmers' markets.

Definition of the food urban region for Mamak District is an important tool that can initially be used in the transformation to a sustainable food system. The participation of the Mamak Municipality in the MUFPP, one of the most significant steps taken in recent years regarding urban food systems, should also be evaluated by the administration as a valuable step towards ensuring sustainable urban food planning for the district.

The most important holistic approach to build sustainable and resilient urban food systems is "urban food planning," which adopts agroecological principles. The primary task to be done for this is to conduct current situation assessments related to agriculture and food, and SWOT analysis is thought to be an important tool in this regard. Examples from around the world demonstrate that local governments play a key role in sustainable urban food planning. Although the role of local government is emphasized in the present study, as it is the local administrative unit closest to the public, in sustainable food systems it is essential for central and local governments to work together regardless of party differences for the continuity and resilience of food systems. Moreover, coordination between the other actors in food systems and policy-making administrative units is also critical when planning a sustainable food system.

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Planlama 2025;Supp(1):74–88 | doi: 10.14744/planlama.2025.90582

ARTICLE / ARAŞTIRMA

"Hidden" Urban Food Strategies: Working "Behind the Scenes" of the International Food Networks from the Global South

"Gizli" Kentsel Gıda Stratejileri: Küresel Güney'den Uluslararası Gıda Ajandasının "Sahne Arkasında" Çalışmak

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ABSTRACT

Urban food strategies have gained significant attention in recent years, particularly those rooted in the Global North and embedded within international networks like the Milan Urban Food Policy Pact. However, this focus has created a research gap in understanding urban food strategies in the Global South, especially in Latin America. Additionally, there is limited exploration of "hidden" urban food strategies that operate outside these international frameworks. This paper investigates such a strategy in Gualeguaychú, an intermediate city in Argentina, which is developing an urban food policy independent of international agreements. Emphasising food sovereignty and alternative food networks, Gualeguaychú's approach offers a unique case to explore how local urban food policies function, the challenges they encounter, and their alignment—or lack thereof—with global food policy frameworks.Through a qualitative-exploratory analysis, this study reviews institutional documents using a public policy analysis framework and examines the city's predominant food supply system alongside its alternative food networks. The findings reveal Gualeguaychú's efforts to reduce dependence on imported food by expanding short food supply chains and implementing redistributive land reforms, aiming to strengthen its local food system. This paper highlights the po-

ÖZ

Kentsel gıda stratejileri son yıllarda, özellikle Küresel Kuzey'de kök salmış ve Milan Kentsel Gıda Politikası Paktı gibi uluslararası ağlarla entegre olan stratejiler büyük ilgi görmüştür. Ancak, bu yoğun ilgi, Latin Amerika gibi Küresel Güney'deki kentsel gıda stratejilerinin anlaşılmasında belirgin bir araştırma boşluğu yaratmıştır. Ayrıca, bu uluslararası çerçevelerin dışında işleyen "gizli" kentsel gıda stratejileri üzerine yapılan araştırmalar oldukça sınırlıdır. Bu makale, Arjantin'in ara şehirlerinden biri olan Gualeguaychú'da, uluslararası anlaşmalardan bağımsız olarak geliştirilen bir kentsel gıda politikasını incelemektedir. Gualeguaychú'nun yaklaşımı, gıda egemenliği ve alternatif gıda ağlarına vurgu yaparak, yerel kentsel gıda politikalarının nasıl işlediğini, bu politikaların karşılaştığı zorlukları ve küresel gıda politikası çerçeveleriyle ne ölçüde uyumlu olup olmadığını keşfetmek için benzersiz bir vaka sunmaktadır. Niteliksel ve keşifsel bir analiz çerçevesinde, bu çalışma kamu politikası analiz çerçevesini kullanarak kurumsal belgeleri incelemekte ve şehrin baskın gıda tedarik sistemi ile alternatif gıda ağlarını değerlendirmektedir. Araştırmanın bulguları, Gualeguaychú'nun ithal gıdaya bağımlılığı azaltma, kısa gıda tedarik zincirlerini genişletme ve toprak reformlarını uygulama çabalarını ortaya koymaktadır. Bu makale, kentsel gıda politikalarının uluslararası çerçevelerin dışında da gelişme potansiyelini

Received: 29.08.2024 Revised: 18.02.2025
Accepted: 07.06.2025 Available online date: 26.08.2025
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tential for urban food policies to evolve outside international frameworks, offering new perspectives from the Global South. Gualeguaychú's experience underscores the importance of local context in shaping urban food strategies and contributes to the broader discourse on food policy innovation.

Keywords: Agroecology; alternative food networks; intermediate cities; local food systems.

vurgulamakta ve Küresel Güney'den yeni perspektifler sunmaktadır. Gualeguaychú'nun deneyimi, kentsel gıda stratejilerinin şekillenmesinde yerel bağlamın ne kadar önemli olduğunu ortaya koymakta ve gıda politikası yeniliği üzerine genişleyen küresel tartışmalara önemli bir katkı sağlamaktadır.

Anahtar sözcükler: Agroekoloji; alternatif gıda ağı; ara şehirler; yerel gıda sistemi.

1. Introduction

The approach to the fundamental importance of food as a universal right and a biologically, socially and culturally necessary element is articulated with the rise of a new food equation that responds to "*the growing concerns about the security and sustainability of the agri-food system*" (Morgan & Sonnino, 2010). Social movements, and some strands of academia and political parties have been pushing this "food agenda" as a priority problem for urban policies in terms of urban food planning. This operational and conceptual approach, which is being increasingly institutionalised, operates within the frame of Food Security, the human right to adequate food and, most notably in some parts of the Global South, with a Food Sovereignty approach which, unlike the previous ones, emphasizes the right of the people to decide their food policies (Bernard et al., 2012; Beuchelt & Virchow, 2012; Cabannes et al., 2018; Holt-Giménez, 2017; López-Giraldo & Franco-Giraldo, 2015).

In this emerging new urban food agenda, the involvement of local governmental agencies in promoting local food supply systems has gained new momentum (Zerbian et al., 2022). This trend has been noted by several authors as the "*rise of municipalities*" in food policy reform (Mansfield & Mendes, 2013; Morley & Morgan, 2021) and has been developed, increasingly, through the emergence of the so-called urban food strategies (UFS). Because of the rapid population growth they are experimenting, especially in the Global South, small and intermediate cities have acquired renewed importance in the construction of ecologically and socially responsible agrofood projects (Civitaresi et al., 2019; FAO, 2019; O. López, 2024). These types of areas are considered to be key players in addressing food system challenges that create more sustainable foodscapes (Hawkes & Halliday, 2017; Manzano & Velázquez, 2015; Moragues-Faus, 2021).

However, the primary arenas for research and experimentation regarding urban food strategies have been the cosmopolitan cities of the Global North (Blay-Palmer, 2009; Ilieva, 2016; D. López et al., 2018). The latter have also been the main actors of the emergence of an innovative urban food policy cross-scalar tool: the city food networks (Milan Urban Food Policy Pact, C40 and CITYFOOD, to name a few) that rely on cross-fertilising knowledge and experiences in order to reinforce a "*global system of sustainable food systems*" (Blay-Palmer et al., 2016; Moragues-Faus, 2021).

Due to its scale, impact and global reach the most important landmark of these international - and institutional - agreements has been the Milan Urban Food Policy Pact (MUFPP).[1] As its official webpage states, the pact is committed "*to develop sustainable food systems that are inclusive, resilient, safe and diverse, that provide healthy and affordable food to all people in a human rights-based framework, that minimize waste and conserve biodiversity while adapting to and mitigating impacts of climate change*." The MUFPP is a concrete working tool that includes 37 recommended actions grouped in 6 categories and operates by fostering city to city cooperation and best practices exchange.

As we have suggested, northern cities not only showcase the most notable UFS, but they also host the headquarters of these key city food networks. As a result, those experiences are the most studied by scholars, leaving a gap in the study of urban food strategies in the Global South, particularly in Latin America. Argentina, for instance, has nine signatory cities of the MUFPP, including Rosario as one of the most advanced cities in terms of urban agroecology, but in most cases, there is no apparent comprehensive urban food strategy to account for. Nonetheless, Gualeguaychú, a city of 130,000 inhabitants internationally recognized for its environmental movement,[2] seems to be the scene of what Morgan (2009) considers a food planning movement, strengthened by an urban food strategy: the Healthy, Safe, and Sovereign Food Plan (HSSFP).[3]

Through a series of initiatives, like the creation of an agroecological colony and the promotion of Alternative Food Networks, the plan "*tends towards the progressive realization of local food sovereignty*". However, notably enough, this city has not signed the MUFPP nor has linked with any city food network. Hence, it remains "hidden" from the international food planning community.

[1] Signed by 290 cities by the beginning of 2025. Some key actors for the installation of common interpretative frameworks, grouped around joint projects of FAO and the RUAF Foundation, were involved in the design of the Milan Pact, actively disseminated by FAO.

[2] In 2003, the construction of a cellulose plant on the shore of the Uruguay River burst the pulp mills conflict in Gualeguaychú. The citizens of Gualeguaychú initiated a movement of protest that soon transcended the local dimension as it is regarded and studied under the notion of ecological citizenship (Melo, 2020).

[3] In Spanish: Plan de Alimentación Sana, Segura y Soberana. It began its implementation in 2018 but was institutionalised in 2021.

This paradox raises important questions about the visibility and legitimacy of urban food strategies beyond dominant governance frameworks as they fly under the radar with undiscovered and unshared learnings. Through the analysis of this initiative, the aim of this paper is to provide insight on how these types of policies work, what kind of challenges they face and how they align with international food policy frameworks, despite working "*behind their scenes*". Results from this study contribute to a deeper understanding of the role that Alternative Food Networks can play in food planning approaches in the Global South. Additionally, it enhances knowledge of urban food strategies rooted in this context, highlighting the challenges of developing innovative policies when certain key factors—such as the continuity of the government and multistakeholder partnerships—are not in place nor well established.

2. Theoretical Framework

The study of urban food strategies (UFS)—comprehensive approaches that cities adopt to address food-related challenges—has become an increasingly significant area of scholarship. As Hawkes and Halliday (2017) noted, an urban food policy involves concerted actions by city governments to tackle these food related challenges. Within urban food policies, two primary approaches can be identified: integrated strategies that address multiple aspects of the food system simultaneously, and single-issue policies that focus on specific, targeted actions (Bricas et al., 2017; Calori et al., 2017). Moragues et al. (2013) define UFS as a "process consisting of how a city envisions change in its food system through a holistic framework that considers both horizontal and vertical dimensions of governance" (p. 6)—the former referring to the integration of multiple policy domains and stakeholders, and the latter encompassing coordination across different levels of government and food system stages.

Ilieva (2017), despite pointing out that there is no single definition of UFS, agrees with Moragues et al. (2013) by pointing out that this kind of initiatives provide a "roadmap" for how to improve the local food system. The mentioned authors also agree that UFS can take many forms as they can be implemented in a top-down or a bottom-up manner (a flexibility of particular importance in our case study) as they are highly conditioned by their local context, but they do catalyse new synergies between local stakeholders. We find that this term, Urban Food Strategy, is the most suitable to adopt in this article given the importance it confers to locality, to the action of different stakeholders and social movements, and due to the broad perspective of initiatives it encompasses.

Research conducted on urban food strategies presents a robust corpus that provides practical guidance on designing urban food strategies (Moragues Faus et al., 2013), insight on food governance practices (López-García et al., 2020; Sonnino, 2016; Zerbian & De Luis Romero, 2023) and deep analysis regarding the monitoring and implementation frameworks, the ideological motivations, and the international food network integration of the UFS (Ilieva, 2017; López Cifuentes et al., 2021; Martín, 2019; Smaal et al., 2021). All in all, these works underscore the importance of urban food strategies as critical tools for addressing the complex challenges of urban food systems but also showcase the difficulties and barriers to implementing them.

We decided to analyse a specific UFS considering the insights provided by this international literature coupled with the policy cycle theory or sequential policy model, as the latter allows a deep understanding of how policies evolve over time. Policy cycle theory proves valuable from both descriptive and explanatory perspectives, even when some stages of the process remain incomplete or when the whole policy comes to a halt (Comba, 2006; Estévez, 2024; Jann & Wegrich, 2017; Nogueira, 1995).

Finally, given the relevant role that Alternative Food Networks (AFN) and Short Food Supply Chains (SFSC) play in urban food strategies and in our case study because of their promotion of healthier and environmentally friendly forms of production, we find it essential to rely on widely referenced studies in international and national literature (Caracciolo et al., 2012; Craviotti & Soleno Wilches, 2015; Goodman, 2003; Renting et al., 2003; Tarditti, 2012). We understand AFN as new organisational structures that carry the potential for political transformation but also as institutional models that promote an alternative rural development paradigm, which in our case refers to the agroecological transition. AFNs involve SFSCs that promote and strengthen physical, social and cultural proximity, by establishing trust bonds and shared values related to the specific attributes of the food. Furthermore, as we are interested in the logistical challenges that urban food strategies involve, we take into account those works that specifically consider these issues (Belletti & Marescotti, 2020; Cendón et al., 2023).

3. Methodology

This study is primarily based on a qualitative-exploratory analysis regarding the urban food strategy and food system of the city of Gualeguaychú, located in the province of Entre Ríos, Argentina. Research involved the systematisation of first-hand interviews conducted with local agents, the examination of national census data and official municipal documents, and the review of specialised literature (Fig. 1).

These methods and sources were employed to characterise the local food supply system and its agents, to explain the challenges of the alternative food landscape, and to examine Gualeguaychú's urban food strategy. The investigation covered the period between 2018–2024, from its beginning to the more recent situation of uncertainty regarding the continuity of the food plan.

Figure 1. Gualeguaychú´s location in Argentina.

Regarding primary sources, we conducted 54 semi-structured interviews with a diverse range of 'food agents' in Gualeguaychú, to ensure that nearly all perspectives within the local food system were captured, with a focus on the fresh food sector (fruits and vegetables) because of its geographical proximity and importance for a healthy nutrition. We interviewed managers of retail stores (three), supermarkets (three), local farmers (seventeen), alternative food traders (three) and consumers (fifteen), qualified informants belonging to national agencies of rural development (nine) and policy makers of different administrations (four). These interviews were conducted between May 2022 and November 2024 and were transcribed immediately after fieldwork. Subsequently, they were analysed using Atlas.ti software through an initial coding of key concepts such as urban food strategy, food logistics, agroecology, and local production (with additional codes being incorporated as the analysis progressed). What is more, we constructed a typology of the actors that sustain the conventional and alternative food supply system.

In relation to the urban food strategy investigated, the Healthy, Safe, and Sovereign Food Plan (HSSFP), we carried out: i) an examination of the phases of the local urban food strategy with a sequential policy model approach that includes the description and analysis of the following processes: agenda-setting, problem definition and policy formulation, implementation, evaluation, and interruption; ii) a detailed review of institutional documents of the HSSFP comparing its guidelines and objectives, as well as its measures, with the Milan Urban Food Policy Pact framework for action, considered as the most developed agreement of urban food policies up to now.

4. The Urban Food System and Supply of Gualeguaychú

Given Argentina's role as a major commodity exporter, Argentine food policies in the last fifty years have tended to focus more on concerns about food security, locally framed as the impact of food prices on the socio-economic conditions of society, rather than on adopting a comprehensive approach to food issues (Barsky, 2020; Borrás, 2013; Craviotti, 2022).

Food policies have manifested through assistance programs to the poor population complemented with the regulation of the prices of key food items through direct intervention or the appellation to the possibility of importing food, according to the orientation of national governments. In spite of a main focus on food security, food sovereignty was also considered in some conjunctures (Blasich, 2020). There have also been programs oriented to support family farming, but they did not address the structural limitations of the sector, so the trend towards land concentration has persisted over time.

Most of these programs have been designed by the national level; the legal framework limits the capacity of the urban governments to carry out development policies. Nonetheless, one big Argentinean city, Rosario, has been able surpass these limitations, develop a globally recognized urban food policy[4] that stands out as an example for the region and leads the way in terms of urban agroecology and innovative food policies that include food sovereignty at its core (Lattuca, 2011).

Within Argentina, Entre Ríos—the province where Gualeguaychú is located—exemplifies a territory that was rapidly integrated into the global agribusiness framework, becoming a key producer of export-oriented commodities such as soy, corn, wheat, and more recently, poultry. This area, situated in the eastern edge of the Pampas plains, has shifted from being a livestock-agricultural to an agricultural-livestock area

[4] Despite having developed actions since 1989, Rosario joined the MUFPP in 2020 and holds, together with Belo Horizonte, the representation of South America in the MUFPP Central Committee. Due to its continuity, it is a well-known experience in international fora and has been awarded by the MUFPP in 2022 in the food production category. For more information see Dubbeling et al. (2016) and Tornaghi and Dehaene (2020).

(Crojethovich et al., 2012). According to Gualeguaychú´s municipal Habitat Secretariat (2022), "*the main crop, nowadays, is soybean, followed by wheat and corn, all cultivated using the direct seeding technology package and the use of chemical inputs*."

In any case, this integration into international commodity chains, which is neither unique nor original to Entre Ríos but rather reflects Argentina's re-primarized accumulation model (Svampa, 2013), underscores the interruption of the state-planned projects of the mid-20th century that aimed to modify the province's agrarian structure, through the establishment of agricultural colonies that would supply its cities with local food.

While food planning was marginalised within state action, several phenomena at the end of the 20th century and the beginning of the 21st century accelerated the decline of pre-existent regional and local horticultural belts. The growing urbanisation, the expansion of grain production, land concentration and the rise of supermarkets -usually multinational enterprises- pushed Gualeguaychú into food dependence.

> *"These processes of industrial agriculture have made it so that a working producer, whose main capital is his labour force, on an 80-hectare field, prefers to rent it out. So, that producer who 30 years ago had chickens, had a considerable vegetable garden with pumpkins is no longer there... (In that time) that production was sold locally."* (Agricultural historian from Gualeguaychú, personal communication, August 2023)

> *"We had a cooperative here, a cold storage plant, we were surrounded by farms, and we [the people from Gualeguaychú] could consume our local production."* (Consumer at a local alternative food retail shop, personal communication, 2022)

Currently, the provincial fruit and vegetable sector shows a poorly developed reality that forces the region to source externally up to 80% of its total demand of vegetables, according to estimates from the 2007/8 provincial horticultural census. Both state agents and qualified informants of Gualeguaychú (farmers, vegetable vendors and consumers) agree on two key issues: i) that the vast majority of fruits and vegetables consumed, except leafy vegetables, are not locally produced, highlighting the importance of the wholesale markets of Buenos Aires, Rosario, and Córdoba, situated at least 200 km. away; and ii) that during the early 2000s, many local farmers abandoned their activities.

> *"My father-in-law, who has worked in this (horticultural production), for 30–40 years, will tell you. There used to be more people producing and there was more local production."* (Farmer of Plaza Belgrano Farmers Market, personal communication, August 2023)

In this context, most of Gualeguaychú's fruit and vegetable supply is managed by various agents who employ different logistical and commercial strategies to ensure food provision. These agents can be classified based on whether they engage (or not) in wholesale redistribution, along with secondary criteria such as their logistics of supply, scale of operation, capital resources, and their sourcing of locally produced vegetables. Despite their diversity, the most significant actors are multinational supermarkets that rely on extra-regional distribution centres and local greengrocers, who control their own logistics, transportation and networks, and thus operate as wholesale distributors within the city.

The fact that these agents are almost entirely supplied with fruits and vegetables from external sources (being leafy vegetables the exception) and of conventional food systems of production that rely heavily on agrochemicals, exposes how Gualeguaychú is being fed. These features partly explain why the urban food strategy initiated in Gualeguaychú aims to achieve a sociocultural shift towards food quality—understood as a polysemic category that encompasses aspects such as nutrition, cultural rootedness, and locality— and to enhance local production, along with a strong emphasis on food safety and health.

5. Gualeguaychú´s Urban Food Strategy

Gualeguaychú´s urban food strategy: the Healthy, Safe, and Sovereign Food Plan (HSSFP), inadvertently began its journey by 2015 with an isolated practice of local food procurement of a short number of public facilities. By 2018 it consciously took a step forward with a highly contested normative disruption, an ordinance that placed a ban on the use of glyphosate. This action framed in health concerns, paved the way for a more comprehensive and constructive approach that regarded its local food system as an integral field of action and transformation that would include health at its core but would focus on food.

This integral approach, the food plan, was based on specific ideological flags — food sovereignty and agroecological production- that reflected the viewpoint of those who participated in the formulation process. With a somewhat clear roadmap that lacked quantitative data but demonstrated a statement of intent -to achieve an agroecological food system transition-, Gualeguaychú´s urban food strategy was officially established by 2021. In order to understand how and why this UFS was designed, how it was implemented, and with which actors, in the next paragraphs we follow the sequential policy model approach to further develop our critical examination of the policy.

A. How did "food" become a public policy in Gualeguaychú?

The local administration that would establish the HSSFP, reached the municipal government by 2015. These authorities were particularly bound to work on health issues as some of them, the mayor for instance, were healthcare

professionals themselves. This is why the incoming government platform included the project of establishing a local vegetable production, free of agrochemicals, to guarantee the local procurement of public facilities, specifically those for early childhood. However, the development of a comprehensive urban food strategy aligned with the idea of food sovereignty was not yet part of the agenda.

The Municipal Food Production Centre[5] was established by September of 2017 in 6 hectares that were obtained on a loan by the municipality. It´s management was commended to a cooperative organisation. Official data reveals that during its first 8 months, the project produced approximately 25 thousand kilos of vegetables such as: chard, parsley, squash, green onion, cucumber, beet, celery, cabbage, and melon.

This experience resembled more of a single-issue policy that focused on a targeted action than an integrated food strategy. However, this approach was bound to an early shift as the growing national, regional and local concern regarding illnesses (cancer being the most notable) connected to the excessive use of agrochemicals (glyphosate) in areas devoted to grain production sparked a nationwide dispute over the safety and sustainability of Argentinian food systems (Blois, 2017; Carrasco et al., 2012).

This national concern over agrochemicals was reflected in the emergence of a national movement that included the networking of social movements, academic researchers and professional associations of which the "Network of Fumigated Towns" was the most recognized (Berger, 2020). As their collective and grassroots actions sparked numerous municipal interventions in the Pampas region, which usually limited the range of use of agrochemicals (particularly glyphosate) within cities' limits, and Gualeguaychú´s society also had health concerns of its own, the situation nudged local authorities to push on this agenda.

The growing number of cancer diseases among local society and the infamous case of a child intoxicated by agrochemicals not only led to the conformation of a local organisation called "Stop Cancer", that orchestrated numerous mobilisations but also drove the local authorities to finance an epidemiological study of cancer.[6] The study found that, overall, the behaviour over time of cancer mortality rates in Gualeguaychú showed a relatively increased risk in the city but there was no relevant annual difference (between the city and what national statistics showed) in the total number of diagnosed cases.

Simultaneously, the local authorities strived to discover the elements that were causing cancer. According to the Health Office Director of the time, they found that the main reasons were issues related to food, water (its components), and, ultimately, the underlying production model that required lots of external inputs to function. What is more, they realised that Gualeguaychú lacked specific legislation for its predominantly rural areas (30,225 hectares of 33,000), despite them being most of the territory.

So, those internal reports and the results of the epidemiologic investigation, plus the society support, legitimised the decision to promote legislation- the same day the results of the report were publicly presented- to regulate and prohibit the existence of glyphosate in the city: the Ordinance Nª 12.216/2018. At this point, as the focus of the issue was shifting towards the characteristics of the local food system, local authorities began to consider the option of formulating a comprehensive urban food policy. To do so, the ecologist[7] blueprint of the local authorities led them to convene various food-related experts from other areas of the country closely linked to the food sovereignty movement to develop and steer an action plan.

With this joint vision, that did not include every local food stakeholder nor relied on a detailed background and baseline research, the Healthy, Safe, and Sovereign Food Plan (HSSFP) began to be conceived and designed.

> *"It's useless to change the entire production model—stop spraying poison on the population, care for the air, the soil, and the people—if you're still eating poorly. If food doesn't become the essence of life, the effort is wasted. Eating junk and unhealthy food doesn't just lead to hunger and malnutrition; even children from wealthy families suffer from poor nutrition. In other words, focusing on only one aspect isn't enough. You could change a community's diet—if that were possible based solely on intentions—but if the surrounding environment remains contaminated with substances like chlorinated compounds or other harmful chemicals, the impact will be limited."* (HSSFP coordinator, personal communication, August 2023)

So, this process of agenda setting demanded a thorough political action. As we have seen, the first intervention involved the ban of glyphosate and established itself as the first legislative precedent (in 2018) of the future urban food strategy that would not be enacted until April 2021. However, during that period, several other local legislations related to food issues were passed: the declaration of municipal interest in family agriculture (2020), the municipal adherence to Sustainable Development Goals (2020) and the incorporation to the National Network of Municipalities and Communities that promote agroecology (RENAMA) in 2021, being the most notorious.

[5] In Spanish: *Centro de Producción de Alimentos Municipal.*

[6] The study evaluated cancer incidence between 2000 and 2011 and mortality between 2000 and 2015.

[7] Dating from the international pulp mill conflict that developed in Gualeguaychú in the mid-2000s (Merlinsky, 2008).

Table 1. Alignment between food sovereignty principles and the healthy, safe, and sovereign food plan (HSSFP)

Food Sovereignty principles from La Via Campesina (1996)	HSSFP measures
Agrarian reform	Create an agroecological colony by loaning municipal owned land to a farmer´s organization
Protecting natural resources	Ban glyphosate, promote agroecology, create a bio-factory
Reorganizing the food trade	Promote short food supply chains and build a Municipal Market
Democratic control	Establish a multi stakeholder food policy council and specific sectoral boards

Source: Own elaboration based on official documentation of the HSFPP.

These municipal ordinances laid the institutional and political groundwork for the comprehensive agro-food policy that was taking shape. They also hinted at an emerging human rights-based approach that would become the cornerstone of the plan, which was complemented by a strong emphasis on food sovereignty.

B. The Healthy, Safe, and Sovereign Food Plan: A holistic strategy

The HSSFP was institutionalised through a municipal legislation that included a series of official comprehensive strategic documents through which the general framework of the program and its formulation was communicated. The strategic document contained: the rationale, objectives, target audience, scope, and lines of action. The rationale was supported by two central principles: i) that food was a human right and that the State—in all its levels—had the obligation to guarantee accessibility; ii) that the primary food production system was in crisis and required an intervention to enable a transition to agroecological production processes that promote human well-being and environmental conservation.

Reading those documents, the HSSFP, already from its name and its strong emphasis on food as a basic human right, aligned itself with the ideals of food sovereignty. The fact that many of its measures line up with the food sovereignty principles from La Via Campesina (1996), as shown in Table 1, evidence this viewpoint. The plan appealed to ideals of food justice that include the democratic participation of all stakeholders and the conservation and restoration of ecological systems.

To achieve these purposes and follow those principles, the objectives of the UFS were grouped into four thematic fields: a) Production, processing, and commercialisation; b) Environmental awareness and responsible consumption; c) Training and knowledge; d) Communication. These thematic fields were integrated by sub-items such as: a.i) Promotion of the local production of pesticide-free foods; b.i) Generation of responsible consumption habits and healthy eating throughout the local population; c.i) Research projects on the local production system, readiness for transition, interests, and demands of the sector; d.i) Creation of an observatory of production and healthy eating with local, provincial, and national experiences and a food policy council.

Programmatically, to organise the achievement of the proposed objectives, the plan was structured through five lines of action: i) Research; ii) Training; iii) Advisory and production; iv) Communication; v) Articulations and alliances.

These lines of action represent the paths for the implementation of the policy. They fulfil the same ordering function as the strategic action framework of the MUFPP by guiding the implementation process. Regarding the target audience and scope of the policy, they aim to operate over the whole department of Gualeguaychú and remain consistent with the notion of sustaining a public policy aligned with the Sustainable Local Development goals.

C. How was the HSSFP implemented?

The implementation is considered the materialisation phase of the policy and, therefore, the essence of any public policy. While this phase constitutes the effective execution of tasks it also includes monitoring and evaluation work and may also include the actions prior to the sanction of the plan, such as the "glyphosate ban", because they specify policy goals and provide political support. What is more, the responsibilities to oversee and develop the policy should be established during this phase.

The enactment of the HSSFP explicitly stated in Article 3 that the Secretary of Social Development, Environment and Health was entrusted with executing the policy. However, it was also stated in Article 4 that the HSSFP must be transversal to all areas. This approach was meant to enhance "Horizontal city-level governance" (one of the urban food policies enabling factors according to Hawkes and Halliday, 2017) and to include several departments engaged with and committed to the policy.

> *"The HSSFP is transversal (horizontal) to all departments. The HSSFP is integrated by the departments of production, environment, bromatology, veterinary medicine, social development, health, and social economy."* (Bromatology Department Member, personal communication, August 2023)

Table 2. Food matrix

Type of production	Origin of production		
	Gualeguaychú	Regional	National
Agroecological	Local labour+healthy food	Regional labour+healthy food	Healthy food
In transition to agroecological	Local labour	Regional labour	
Agroindustrial	Local labour	Regional labour	

Source: Own elaboration based on official documentation of the HSSFP. HSSFP: Healthy, safe, and sovereign food plan.

Despite the virtue of this approach, its execution proved to be too horizontal to actually strengthen the implementation of practices, as there was no specific governance body structure of the HSSFP to ensure accountability, nor did external stakeholders (outside the municipality) have clarity about the main institutional actors of the policy. That is why eventually the policy found its institutional place at the Environmental department.

> *"At first, the HSSFP was very transversal to the municipal government due to the complexity of the program. In other words, we (nutritionists, food scientists, administrators, etc.) understood that we were all contributing to making healthy, safe and sovereign food. The perspective was to understand life from another place, to "imitate" how the "monte" (forest) works. That (transversality-horizontal governance) was a virtue, without a doubt, but we (local governments and authorities) are not prepared to work with that scheme. Then, a year or two later, it (the HSSFP) had to be anchored."* (HSSFP coordinator, personal communication, August 2023)

After addressing the governance of the policy, the plan's roadmap required budgeting and further clarification. Regarding funding, the plan received a national endowment for nearly 200.000 dollars and obtained 185.000 dollars via the municipal budget in 2022. Regarding clarification, conceptual tools like "scenario construction" are often employed during implementation to guide actions, and in Gualeguaychú, this framework was effectively applied. Using a rapid assessment, the municipality's technical teams developed a food matrix (Table 2) that mapped the geographical origin of food consumed in Gualeguaychú. This matrix served as the foundation for defining the "base scenario" of the local food system and envisioning a "desired scenario" to guide the UFS efforts.

The trajectory from the "*Supply and consumption of national and agro-industrial food production*" (considered the "baseline" scenario, as informal official data suggests that only 5%–8% of food was produced locally), to the "*Supply and consumption of local and agroecological food production*" situation (considered to be the "desired" scenario) was meant to include the passage through intermediate stages of regional food production (hence, moving from the right bottom quadrant in red to the upper left quadrant in green) that were also considered an improvement of the initial scenario.

Moreover, that progression, and every other practice within the food plan for that matter, also took into account the estimation of how much food the department required to be fed. For that purpose, according to the dietary official guidelines for the Argentine population, Gualeguaychú needed per month: 1,200,000 litres of milk and yogurt, 72,000 kg of fresh cheese, 100,000 dozen of eggs, 312,000 tons of meat, 960,000 kg of vegetables, 720,000 kg of fruit, 72,000 kg of oil, seed and dried fruits, and 4,800,000 litres of safe water.

Even though the food demand estimates were more a declaration of intent than an actual achievable goal, every practice and measure carried out had in its core the idea of shortening the distance between the baseline and the desired scenario. Therefore, the main practices of the UFS were aimed at increasing the volume of local produce and strengthening commercialisation (and healthy consumption) through short food supply chains. Within the first realm, the creation of an agroecological colony was the key initiative (arguably the most important project of the policy), alongside a Participatory Local Agroecological Guarantee System that could not be established. The opening of a Municipal Market represented the main effort in terms of food supply and distribution.

Regarding the agroecological colony, its construction began with the decision (disputed by environmentalist groups and political opposition) of developing agroecological production sites in a municipal-owned natural reserve called "Las Piedras", that was previously loaned to private users.[8] The local authorities decided to reorganise the use of these 300 hectares and destinate 60 to agroecological production (and let the rest for conservation purposes) complemented by the instalment of a biofactory to supply organic inputs to the producers of the colony and other areas of Gualeguaychú. This biofactory produced up to eight thousand liters of bioles[9] annually since 2020.

[8] Who developed a racetrack venture and established an agrarian school.

[9] Liquid fertilizers made from whey and bovine manure, essential inputs to ensure agricultural production without agrochemicals.

> *"The challenge of conserving and producing, and producing while conserving, was an interesting objective."* (HSSFP coordinator, personal communication, August 2023)

To do so, the municipality signed a management agreement in 2021 with a farmer organisation, the "Union of Land Workers (ULW-UTT),[10] notable for its agroecological and food sovereignty viewpoints that vindicate a national land reform (Acero Lagomarsino, 2022; Sotiru, 2021). The ULW-UTT was "loaned" with 15 hectares of land to be worked by 10 farmer families belonging to the organisation. The referred agreement also included the municipal commitment to build houses for these families (on additional land inside the conservation area). ULW-UTT farmers assumed the compromise of delivering 20% of its produce to public facilities. However, as the main members of the organization are farmers of the Buenos Aires horticultural belt, this meant that the members of the colony would not belong to Gualeguaychú. This would later prove to be a problem as local stakeholders felt undervalued within the UFS.

Despite the colony's primary focus on horticultural production, it was sought to include egg, fruit, and honey production, along with regenerative livestock. While the project initially benefited from national and municipal funding, as well as political support, after two years of operation it only managed to cultivate three hectares of horticulture (with the labour of two farmers that established themselves in "Las Piedras" during 2020) and to hold, discontinuously, a mobile chicken coop for 200 chickens. Despite the lack of houses (they were never constructed) being a big factor of these shortcomings, other issues also took their toll.

> *"It's a combination of things: working with the municipality is slow; in Gualeguaychú, summers are extremely hot, and lettuce gets scorched, while in winter, it's very cold, so lettuce, chard, and beets also suffer from frost damage; accessibility to Las Piedras is impossible when it rains; most farmers want to have dogs, but here, it's not feasible; waste management is another issue—there's a habit of separating waste here. So, starting a farm from scratch in a new province is quite a big challenge."* (ULW Farmer in Gualeguaychú, personal communication, June 2022)

Furthermore, the ULW, the managing organization, faced challenges to allocate sufficient resources and attention to the colony, as it was engaged in multiple advocacy efforts at national, regional, and local levels due to its rise in public and political exposure amid high-level national political commitment during the period of 2019–2023. Nevertheless, compounding these issues, a political shift in 2024 led to reduced backing from authorities, halting progress during a contentious election year.

This process reveals the coexistence of two contrasting policy implementation perspectives. On one hand, it can be seen as a bottom-up initiative, given its alliance with a national stakeholder that represented and advocated for the demands of small agroecological farmers: the ULW-UTT. On the other hand, local stakeholders perceived it as a top-down, vertical practice, feeling excluded from the process and viewing the new, "foreign" actor, as disproportionately prioritized, although support to local horticultural farmers was also given, and a cooperative of local producers was also created with the help of the local government.

Lastly, the HSFPP also promoted community gardens through advice and training workshops, assistance with tools and biological inputs, and seed and seedlings distribution alongside the National Institute of Agricultural Technology. At some point during 2020 there were up to 500 vegetable gardens functioning in the city according to the authorities interviewed.

> *"We work with different types of gardens because there are institutional gardens—such as those in health centres or schools—that serve an educational or social support purpose; family gardens; and collective-process gardens, such as community-popular gardens. Or even the biopark [Colonia Las Piedras], which works similarly to Rosario´s community gardens."* (Member of the Social Economy department, virtual interview, November 2022)

When it comes to food supply and distribution, two main practices were implemented: the establishment of the "Nutrir Program", and the promotion of alternative short food supply chains of which the creation of the Municipal Market was the main accomplishment.

The *Nutrir Program* (now called *IgualAR* under the new administration) is a state-funded initiative that began in 2021. The municipality provided a registered credit card, loaded with either 25,000 or 60,000 Argentine pesos,[11] to 2,150 low-income families in 2023 to enhance food security. Eventually, the Nutrir team managed to incorporate the Municipal Market into the stores that could accept the Nutrir card, nudging the recipients towards the adoption of more sustainable diets. But they could not convince farmer´s market members to get a bank account and be able to accept the card instead of cash.

Regarding the enhancement of short food supply chains, its goal was to facilitate the commercialisation of local production directly from its producers; hence benefiting local farmers and guaranteeing the physical and economic access of agroecological food to local society. The HSFPP input was to guide on bromatological and productive issues, and counsel on the procurement of funding, apart from guaranteeing a public space for the farmers markets and providing sponsorship and publicity.

[10] In Spanish: *Unión de Trabajadores de la Tierra*.

[11] Approximately 86 and 205 US dollars monthly considering the official exchange rate annual average.

As a matter of fact, the establishment of short food chains has been notable in the city. A new farmer market that involved the participation and strengthened the work of three new agroecological farmers[12] was set up in 2021 (the Belgrano Square Agroecological Farmers Market) and a food cooperative that holds an agroecological and social economy approach was formalised in 2021 (Demicheli & Craviotti, 2023). Additionally, the Municipal Market was launched at the end of the same year. These three new agroecological experiences added up to the pre-existing Green Farmers Market -whose three farmers[13] began an agroecological transition under the HSFPP and together multiplied the availability of spaces for purchasing healthy and mainly locally produced food.

These AFN show diversity from the organisational point of view (direct marketing from the producers, initiatives managed by solidarity intermediaries and a state-managed producer-to-consumer market) and regarding the qualities of food they sell. Food may be organic, such as the "yerba mate" offered by Ñande cooperative; agroecological, like the vegetables at Belgrano Square and the fruits at the Municipal Market; transitioning to agroecological, as the vegetables at the Green Farmers Market; or conventionally produced by a cooperative, like the rice and pasta sold at the Municipal Market.[14] But, aside from seasonal vegetables, most of these products are predominantly sourced from non-local producers, accessed through urban agroecological operators located in Buenos Aires wholesale market. These nonlocal agents guarantee a continuous supply throughout the year of certain types of agroecological, organic, and/or cooperative food. Thus, coordination with these actors allows the local AFN to expand their food offering to consumers and specialized wholesalers stand out as critical agents from the logistical point of view (Craviotti & Demicheli, 2023).

Finally, in other areas of the food strategy, although the HSSFP envisaged actions related to research, communication, food waste and organising stakeholder participation- results have been somewhat limited. When it comes to research and communication, two scientific congresses on food, agroecology, and food sovereignty were held to share the achievements and raise awareness. Regarding food waste, the "EcoPark", a waste separation plant founded in 2014, managed to process approximately five tons of food waste per week at its peak. Finally, regarding the "horizontal" city level governance, while there have been efforts to establish sectoral stakeholder boards to swiftly introduce the idea of forming a food policy council, these initiatives did not materialise into a consolidated entity. As a result, the UFS reflected more of a top-down approach with little horizontal governance or participatory multi stakeholder processes, a key aspect to develop rootedness in the local society.

D. The interruption of the UFS

In the case of the HSSFP, an institutionalised evaluation -that should allow the understanding and analysis of the impacts and results of the policy-, whether qualitative, quantitative, or mixed, has not been developed and no indicators have been constructed. Similarly, the UFS has not reached an official reformulation phase, even though many practices were transformed and adjusted permanently. The primary explanation for these shortcomings lies in financial constraints, inadequate participatory policy processes, scarce data collection, political timing, insufficient institutional capacities and, most notably, the change in municipal leadership following the 2023 elections.

In fact, the administration that implemented the HSSFP failed to secure re-election, and an ideologically opposed party assumed power, choosing not to continue the policy. As a result, many initiatives that were incorporated into the food plan documents were left incomplete or never initiated at all.

Why did the HSSFP come to a halt? There are several reasons that explain this decision: i) there was a change in the political atmosphere at the national, provincial and municipal sphere, implying a shift towards neoliberal-conservative approaches. New authorities do not "believe" in agroecology as a valid, comprehensive food system approach, nor do they think the current food system is in crisis; ii) the new government has stronger ties to agribusiness stakeholders, as evidenced by their sponsorship of the revocation of the glyphosate ban in October 2024; iii) the HSSFP did not have enough support from local society nor productive stakeholders; iv) the agroecological colony did not show sufficient progress, and v) the Municipal Market was unable to establish itself as a regular destination for neighbours to purchase food (it was located too far away from the city centre) even though eventually, it established a program called "The Market in your neighbourhood" to tackle the challenge of making agroecological food accessible for the low-income families.

6. A Hidden Urban Food Strategy?

Now we can answer one of the main questions we asked in the Introduction. How did this Argentinian UFS relate to an international city food network such as the Milan Urban Food Policy Pact? Argentinian cities, with the notable exception of Rosario, have not been too interested in being part of the new international food agenda nor in constructing Latin American city food networks. Despite this fact, the MUFPP appears to be the main stage of participation as nine (9) Argentinian cit-

[12] Each of these farmers produce on one hectare of land.

[13] Each of these farmers produce on two hectares of land (Demicheli & Craviotti, 2023; Pérez, 2020).

[14] These categories are not mutually exclusive—food can be both agroecological and cooperative, highlighting the intersection of sustainable practices and collective efforts.

Table 3. Actions of the HSSFP in terms of the MUFPP framework

HSSFP framework for action	Actions - HSSFP	N° actions of the MUFPP
Production, added value, and commercialisation	Promote local production of pesticide-free foods.	20° - Promote and strengthen urban and periurban food production based on sustainable approaches.
	Strengthen and add value to the primary production of healthy foods.	24° - Help provide services to food producers.
	Encourage the development and economic viability of short food supply chains that allow safe access to healthy foods.	25° - Support short food chains. 32° - Expand support for infrastructure related to food market systems.
	Contribute to the understanding of climate change, its causes and consequences, and the mitigation and adaptation measures of the production practices.	34° - Convene food system actors to assess and monitor food loss and waste. 35° - Raise awareness of food loss and waste.
Environmental community and responsible consumption	Create responsible consumption and healthy eating habits among the entire local population.	7° - Promote sustainable diets and nutrition.
	Empower organisations and social groups in Gualeguaychú committed to environmental care and sustainable development.	2° - Enhance stakeholder participation.
	Influence the food supply and diets habits of public schools that have cafeterias.	30° - Review public procurement. 15° - Reorientate school feeding programmes.
Training and knowledge generation	Study of risk perception and vulnerability of different social sectors of the Gualeguaychú population.	8° -Address diseases associated with poor diets and obesity.
Communication	Create an observatory of "health and nutritive production" with local, provincial, and national agents.	5° -Develop multisectoral information systems.
	Generate networks of responsible producers and consumers.	18° - Promote networks and grassroots activities.
	Offer training and peer to peer exchange opportunities on addressing environmental issues in the media.	19° - Promote education, training and research.

HSSFP: Healthy, safe, and sovereign food plan; MUFPP: Milan urban food policy pact.

ies have signed it,[15] even though, for the most part - if not entirely - they exhibit specific practices (working on one or two categories of the framework for action) or do not have a practice at all (almost 50% do not have a practice).[16]

However, we have argued that this is not the whole reality as Gualeguaychú had an urban food strategy although the city did not sign any international agreements, meaning it operated behind the scenes of the international city food network. So, given that the MUFPP is the most influential city food network in Argentina and probably of the world, how can we situate the HSSFP's strategy, compared to the MUFPP's framework for action? Could a significant difference between the two approaches be the reason why Gualeguaychú opted not to sign the pact or join any other international food network?

The results presented in Table 3 show that the framework for action of the HSSFP and the MUFPP were actually aligned. As previously stated, Gualeguaychú´s UFS presented (although not always completely addressed) actions that relate to all the practice categories (6) the MUFPP proposes as framework for action: Governance, Sustainable diets and Nutrition, Social and Economic Equity, Food Production, Food Supply and Distribution and Food Waste. We can identify various measures the HSSFP implemented that aligned with the MUFPP actions:

- HSSFP creation of an agrarian colony - agricultural park- sustains MUFPP action N° 23 "*Protect and enable secure access and tenure to land for sustainable production in urban and peri urban areas*" (Food production).

[15] Tandil- Esteban Echeverría - San Antonio de Areco - Ciudad Autónoma de Buenos Aires - Rosario - Santa Fe - Córdoba - Godoy Cruz - Río Grande.

[16] According to the MUFPP official website, the following signatory cities do not present any practice at all: Tandil, Esteban Echeverria, Santa Fe and Godoy Cruz.

- HSSFP construction of a biofactory to supply organic inputs to producers may be included within MUFPP action N° 24 "*Help provide services to food producers*" (Food production).
- The fact that HSSFP was envisioned as transversal to all management and institutionalised via municipal legislation, relates to MUFPP action N° 1 "*Facilitate collaboration across city agents and departments*" (Governance).
- HSSFP "Nutrir program" (a registered credit card containing state funds to spend on food) to support food security and nudge consumption towards healthy choices is essentially, MUFPP action N° 14 "*Use cash and food transfers*" (Social and economic equity).

Then, what could have been the reasons for opting to not engage with the MUFPP or any other city food network? According to the local authorities interviewed -coordinators and members of the HSSFP- there were at least three (3) reasons that explain this:

I. There was a strong desire to build on local methodologies with local and national experts, creating distance from external influences to foster independence and sovereignty.
II. Reflecting on external experiences from other cities was not part of the formulation process, even though the individuals that participated in them may have had references about some of them. Consequently, worldwide urban food strategies experiences were mostly unknown or at least not clearly incorporated into the strategy.
III. There was a sense of alert or aversion to joining supranational institutional frameworks as those highly institutionalised arenas were viewed as instruments for the "maintenance of the status quo". They were understood as strengthened by organisations that do not belong to the Global South which, to accept participation may require to compromise or to agree on certain issues that local authorities may be resistant to accept.

So, joining a highly institutionalized network, such as the one sponsored by the FAO, was not even considered an option. Their decision was not a rejection of the MUFPP itself but rather a refusal to engage with the international urban food policy arena. Instead, they chose to remain "hidden."

As stated before, the reasons they remained "behind the scenes" of international city food networks and urban food policy arenas were primarily ideological, rather than pragmatic or operational. HSSFP's commitment to principles of social justice, agroecology, and food sovereignty may be seen as values that serve as banners of resistance and alternatives strongly tied to social movements from the Global South. These principles are less integrated into the urban food strategies of the Global North (Smaal et al., 2021). This ideological positioning helps to explain the reluctance of key local actors to engage with institutions perceived as colonialist organizations of the Global North, reflecting a conscious effort to prevent institutional co-optation (Altieri & Nicholls, 2012; Giraldo & Rosset, 2016; Laforge et al., 2017). This perspective suggests that the Global South may serve as a more likely host for these "hidden" UFS—a line of inquiry that warrants further exploration.

Then, should the South build its own city food networks or overcome differences and join these global structures? Which would be the pros and cons of both alternatives? Whatever the answer might be, as recent as 2024, a new network called "Intermediate cities and food systems network",[17] has been leading the way in the South. However, as this new network holds sponsorship from supranational institutions like FAO, concerns about external influence and control may persist.

Lastly, while we can only speculate whether signing the MUFPP or joining any city food network would have ensured a better implementation of the food strategy, the acquisition of additional funds, or, most importantly, the continuity of the policy—a key factor for the success of food policies, often defined as "political commitment that transcends electoral cycles" and "participatory policy process" (Hawkes & Halliday, 2017)—integrating this kind of networks could have been beneficial, at least, for strengthening the evaluation phase. This could have been achieved by adapting the MUFPP's indicators to align with local characteristics. Ultimately, a crucial question arises: does joining a city food network truly guarantee the continuity of urban food systems?

7. Conclusion

Having begun the paper by showcasing—and perhaps aiming to highlight—southern urban food strategies in intermediate cities that rely on the functioning of alternative food networks, we found that in Gualeguaychú there is still a predominance of a strongly consolidated, conventional food system that does not necessarily value food as the *grand social connector* we believe it to be.

At first glance, recognizing the hegemony (in terms of capitalization, impact, scale, and presence) of conventional circuits might be disappointing for the *sitopic* reader. However, this analysis has also allowed us to acknowledge the existence of alternative, agroecological marketing experiences that increasingly incorporate the participation of traditional and emerging local horticultural producers, who despite the interruption of the UFS continue to operate. The strengthening of these actors in a context mediated by the precedent, almost unique in our country, of an urban food strategy grounded in a human rights and food sovereignty perspective needs to be recognized and valued.

[17] In Spanish: *Red de Ciudades Intermedias y Sistemas Alimentarios*.

Gualeguaychú´s HSSFP aimed "*towards the progressive realisation of local food sovereignty*" through the implementation of a five-dimension framework for action and outlined a series of practices that encompass all the lines of action proposed by the Milan Urban Food Policy Pact (MUFPP). As it also introduces the urban environment as the primary territory of intervention, we may conclude that the HSSFP qualifies as an Urban Food Strategy that effectively aligns with many of the objectives set by the MUFPP.

Nonetheless, this alignment did not translate into networking with the MUFPP or with any other city food network. As this decision appears to be intentional -due to ideological reasons-, we qualify it as a "hidden urban food strategy". In a first stance we wondered whether this political and symbolic decision was worth it or if ideology outweighed the practical benefits of joining a global alliance that guarantees international legitimacy to certain local processes and could potentially ensure the continuity of a project, making it more resistant to municipal electoral cycles. Now, recognizing the interruption of the policy, that question remains unanswered and more relevant than ever.

In this sense, even though we cannot guarantee that being part of a food network is a sufficient condition to ensure the continuation of UFS, we do think that promoting a better and true involvement of local actors in the design and implementation—allowing them to have a voice and negotiate with external stakeholders—helps to sustain a policy. Having monitoring indicators also contributes by enabling the systematization of results and making them visible for the community and for the incoming authorities.

When it comes to its implementation, the HSSFP was analysed in line with the "*public policy cycle*" theory, though it did not complete all the phases. The proponents of the HSSFP clearly identified a problem to be addressed: the existence of a food production model in crisis, and they consciously incorporated it into their political platform. From that point onwards, they simultaneously advanced in the formulation, enactment and implementation of the policy despite the numerous challenges (not always surpassed) presented: the establishment of a multistakeholder policy process to improve food democracy, the elaboration of adequate monitoring mechanisms, the collection of data to make the right technical decisions, and finally the ability to surpass political discrepancies.

Despite its drawbacks, many implementation measures have been successful and stand out as significant policy achievements. These include the growth in the number of local agroecological farmers -although still low-, the establishment of some alternative marketing spaces where local producers can sell at fair prices, the improvement of consumer access to local and agroecological food, and the creation of an agroecological colony -agricultural park- (now dismantled). Additionally, while the institutionalization of the UFS and food-related legislation made the policy legally binding and was a significant milestone, it ultimately proved to be insufficient.

Regarding the AFN in Gualeguaychú, even though its supply depends partly on food produced in other regions and despite the lack of quantitative data to fully understand the impact of such alternative food experiences and their potential to scale up agroecology in all its dimensions, the presence of different short and alternative food supply chains remains significant because, as Glanz et al. (2005) observed, *"the availability of spaces for purchasing 'healthy/local' food defines a food environment, which in turn affects eating habits"*—a critical element in building a more liveable, just, and healthy reality.

All in all, weighing the contributions and limitations of the HSSFP, the promise of building a fairer, healthier, and more sovereign food reality remains within reach through urban food policies—provided they maintain continuity over time. This potential persists even when these policies develop outside international frameworks and take shape in the Global South. However, continuity and impact are not guaranteed by institutionalization alone. The experience of Gualeguaychú underscores that meaningful, long-term transformation depends on deep local engagement, adaptive governance, and mechanisms that ensure resilience beyond political cycles. If urban food strategies are to be truly transformative, they must not only secure legal recognition but also cultivate strong social foundations that empower local actors to sustain and expand their efforts. The engaged actors in cities like Gualeguaychú exemplify this possibility, demonstrating that even in challenging contexts, alternative food networks and agroecological movements can endure and inspire broader systemic change.

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Planlama 2025;Supp(1):74–88 | doi: 10.14744/planlama.2025.90582

ARTICLE / ARAŞTIRMA

"Hidden" Urban Food Strategies: Working "Behind the Scenes" of the International Food Networks from the Global South

"Gizli" Kentsel Gıda Stratejileri: Küresel Güney'den Uluslararası Gıda Ajandasının "Sahne Arkasında" Çalışmak

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ABSTRACT

Urban food strategies have gained significant attention in recent years, particularly those rooted in the Global North and embedded within international networks like the Milan Urban Food Policy Pact. However, this focus has created a research gap in understanding urban food strategies in the Global South, especially in Latin America. Additionally, there is limited exploration of "hidden" urban food strategies that operate outside these international frameworks. This paper investigates such a strategy in Gualeguaychú, an intermediate city in Argentina, which is developing an urban food policy independent of international agreements. Emphasising food sovereignty and alternative food networks, Gualeguaychú's approach offers a unique case to explore how local urban food policies function, the challenges they encounter, and their alignment—or lack thereof—with global food policy frameworks.Through a qualitative-exploratory analysis, this study reviews institutional documents using a public policy analysis framework and examines the city's predominant food supply system alongside its alternative food networks. The findings reveal Gualeguaychú's efforts to reduce dependence on imported food by expanding short food supply chains and implementing redistributive land reforms, aiming to strengthen its local food system. This paper highlights the po-

ÖZ

Kentsel gıda stratejileri son yıllarda, özellikle Küresel Kuzey'de kök salmış ve Milan Kentsel Gıda Politikası Paktı gibi uluslararası ağlarla entegre olan stratejiler büyük ilgi görmüştür. Ancak, bu yoğun ilgi, Latin Amerika gibi Küresel Güney'deki kentsel gıda stratejilerinin anlaşılmasında belirgin bir araştırma boşluğu yaratmıştır. Ayrıca, bu uluslararası çerçevelerin dışında işleyen "gizli" kentsel gıda stratejileri üzerine yapılan araştırmalar oldukça sınırlıdır. Bu makale, Arjantin'in ara şehirlerinden biri olan Gualeguaychú'da, uluslararası anlaşmalardan bağımsız olarak geliştirilen bir kentsel gıda politikasını incelemektedir. Gualeguaychú'nun yaklaşımı, gıda egemenliği ve alternatif gıda ağlarına vurgu yaparak, yerel kentsel gıda politikalarının nasıl işlediğini, bu politikaların karşılaştığı zorlukları ve küresel gıda politikası çerçeveleriyle ne ölçüde uyumlu olup olmadığını keşfetmek için benzersiz bir vaka sunmaktadır. Niteliksel ve keşifsel bir analiz çerçevesinde, bu çalışma kamu politikası analiz çerçevesini kullanarak kurumsal belgeleri incelemekte ve şehrin baskın gıda tedarik sistemi ile alternatif gıda ağlarını değerlendirmektedir. Araştırmanın bulguları, Gualeguaychú'nun ithal gıdaya bağımlılığı azaltma, kısa gıda tedarik zincirlerini genişletme ve toprak reformlarını uygulama çabalarını ortaya koymaktadır. Bu makale, kentsel gıda politikalarının uluslararası çerçevelerin dışında da gelişme potansiyelini

Received: 29.08.2024 Revised: 18.02.2025
Accepted: 07.06.2025 Available online date: 26.08.2025
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tential for urban food policies to evolve outside international frameworks, offering new perspectives from the Global South. Gualeguaychú's experience underscores the importance of local context in shaping urban food strategies and contributes to the broader discourse on food policy innovation.

Keywords: Agroecology; alternative food networks; intermediate cities; local food systems.

vurgulamakta ve Küresel Güney'den yeni perspektifler sunmaktadır. Gualeguaychú'nun deneyimi, kentsel gıda stratejilerinin şekillenmesinde yerel bağlamın ne kadar önemli olduğunu ortaya koymakta ve gıda politikası yeniliği üzerine genişleyen küresel tartışmalara önemli bir katkı sağlamaktadır.

Anahtar sözcükler: Agroekoloji; alternatif gıda ağı; ara şehirler; yerel gıda sistemi.

1. Introduction

The approach to the fundamental importance of food as a universal right and a biologically, socially and culturally necessary element is articulated with the rise of a new food equation that responds to "*the growing concerns about the security and sustainability of the agri-food system*" (Morgan & Sonnino, 2010). Social movements, and some strands of academia and political parties have been pushing this "food agenda" as a priority problem for urban policies in terms of urban food planning. This operational and conceptual approach, which is being increasingly institutionalised, operates within the frame of Food Security, the human right to adequate food and, most notably in some parts of the Global South, with a Food Sovereignty approach which, unlike the previous ones, emphasizes the right of the people to decide their food policies (Bernard et al., 2012; Beuchelt & Virchow, 2012; Cabannes et al., 2018; Holt-Giménez, 2017; López-Giraldo & Franco-Giraldo, 2015).

In this emerging new urban food agenda, the involvement of local governmental agencies in promoting local food supply systems has gained new momentum (Zerbian et al., 2022). This trend has been noted by several authors as the "*rise of municipalities*" in food policy reform (Mansfield & Mendes, 2013; Morley & Morgan, 2021) and has been developed, increasingly, through the emergence of the so-called urban food strategies (UFS). Because of the rapid population growth they are experimenting, especially in the Global South, small and intermediate cities have acquired renewed importance in the construction of ecologically and socially responsible agrofood projects (Civitaresi et al., 2019; FAO, 2019; O. López, 2024). These types of areas are considered to be key players in addressing food system challenges that create more sustainable foodscapes (Hawkes & Halliday, 2017; Manzano & Velázquez, 2015; Moragues-Faus, 2021).

However, the primary arenas for research and experimentation regarding urban food strategies have been the cosmopolitan cities of the Global North (Blay-Palmer, 2009; Ilieva, 2016; D. López et al., 2018). The latter have also been the main actors of the emergence of an innovative urban food policy cross-scalar tool: the city food networks (Milan Urban Food Policy Pact, C40 and CITYFOOD, to name a few) that rely on cross-fertilising knowledge and experiences in order to reinforce a "*global system of sustainable food systems*" (Blay-Palmer et al., 2016; Moragues-Faus, 2021).

Due to its scale, impact and global reach the most important landmark of these international - and institutional - agreements has been the Milan Urban Food Policy Pact (MUFPP).[1] As its official webpage states, the pact is committed "*to develop sustainable food systems that are inclusive, resilient, safe and diverse, that provide healthy and affordable food to all people in a human rights-based framework, that minimize waste and conserve biodiversity while adapting to and mitigating impacts of climate change*." The MUFPP is a concrete working tool that includes 37 recommended actions grouped in 6 categories and operates by fostering city to city cooperation and best practices exchange.

As we have suggested, northern cities not only showcase the most notable UFS, but they also host the headquarters of these key city food networks. As a result, those experiences are the most studied by scholars, leaving a gap in the study of urban food strategies in the Global South, particularly in Latin America. Argentina, for instance, has nine signatory cities of the MUFPP, including Rosario as one of the most advanced cities in terms of urban agroecology, but in most cases, there is no apparent comprehensive urban food strategy to account for. Nonetheless, Gualeguaychú, a city of 130,000 inhabitants internationally recognized for its environmental movement,[2] seems to be the scene of what Morgan (2009) considers a food planning movement, strengthened by an urban food strategy: the Healthy, Safe, and Sovereign Food Plan (HSSFP).[3]

Through a series of initiatives, like the creation of an agroecological colony and the promotion of Alternative Food Networks, the plan "*tends towards the progressive realization of local food sovereignty*". However, notably enough, this city has not signed the MUFPP nor has linked with any city food network. Hence, it remains "hidden" from the international food planning community.

[1] Signed by 290 cities by the beginning of 2025. Some key actors for the installation of common interpretative frameworks, grouped around joint projects of FAO and the RUAF Foundation, were involved in the design of the Milan Pact, actively disseminated by FAO.

[2] In 2003, the construction of a cellulose plant on the shore of the Uruguay River burst the pulp mills conflict in Gualeguaychú. The citizens of Gualeguaychú initiated a movement of protest that soon transcended the local dimension as it is regarded and studied under the notion of ecological citizenship (Melo, 2020).

[3] In Spanish: Plan de Alimentación Sana, Segura y Soberana. It began its implementation in 2018 but was institutionalised in 2021.

This paradox raises important questions about the visibility and legitimacy of urban food strategies beyond dominant governance frameworks as they fly under the radar with undiscovered and unshared learnings. Through the analysis of this initiative, the aim of this paper is to provide insight on how these types of policies work, what kind of challenges they face and how they align with international food policy frameworks, despite working "*behind their scenes*". Results from this study contribute to a deeper understanding of the role that Alternative Food Networks can play in food planning approaches in the Global South. Additionally, it enhances knowledge of urban food strategies rooted in this context, highlighting the challenges of developing innovative policies when certain key factors—such as the continuity of the government and multistakeholder partnerships—are not in place nor well established.

2. Theoretical Framework

The study of urban food strategies (UFS)—comprehensive approaches that cities adopt to address food-related challenges—has become an increasingly significant area of scholarship. As Hawkes and Halliday (2017) noted, an urban food policy involves concerted actions by city governments to tackle these food related challenges. Within urban food policies, two primary approaches can be identified: integrated strategies that address multiple aspects of the food system simultaneously, and single-issue policies that focus on specific, targeted actions (Bricas et al., 2017; Calori et al., 2017). Moragues et al. (2013) define UFS as a "process consisting of how a city envisions change in its food system through a holistic framework that considers both horizontal and vertical dimensions of governance" (p. 6)—the former referring to the integration of multiple policy domains and stakeholders, and the latter encompassing coordination across different levels of government and food system stages.

Ilieva (2017), despite pointing out that there is no single definition of UFS, agrees with Moragues et al. (2013) by pointing out that this kind of initiatives provide a "roadmap" for how to improve the local food system. The mentioned authors also agree that UFS can take many forms as they can be implemented in a top-down or a bottom-up manner (a flexibility of particular importance in our case study) as they are highly conditioned by their local context, but they do catalyse new synergies between local stakeholders. We find that this term, Urban Food Strategy, is the most suitable to adopt in this article given the importance it confers to locality, to the action of different stakeholders and social movements, and due to the broad perspective of initiatives it encompasses.

Research conducted on urban food strategies presents a robust corpus that provides practical guidance on designing urban food strategies (Moragues Faus et al., 2013), insight on food governance practices (López-García et al., 2020; Sonnino, 2016; Zerbian & De Luis Romero, 2023) and deep analysis regarding the monitoring and implementation frameworks, the ideological motivations, and the international food network integration of the UFS (Ilieva, 2017; López Cifuentes et al., 2021; Martín, 2019; Smaal et al., 2021). All in all, these works underscore the importance of urban food strategies as critical tools for addressing the complex challenges of urban food systems but also showcase the difficulties and barriers to implementing them.

We decided to analyse a specific UFS considering the insights provided by this international literature coupled with the policy cycle theory or sequential policy model, as the latter allows a deep understanding of how policies evolve over time. Policy cycle theory proves valuable from both descriptive and explanatory perspectives, even when some stages of the process remain incomplete or when the whole policy comes to a halt (Comba, 2006; Estévez, 2024; Jann & Wegrich, 2017; Nogueira, 1995).

Finally, given the relevant role that Alternative Food Networks (AFN) and Short Food Supply Chains (SFSC) play in urban food strategies and in our case study because of their promotion of healthier and environmentally friendly forms of production, we find it essential to rely on widely referenced studies in international and national literature (Caracciolo et al., 2012; Craviotti & Soleno Wilches, 2015; Goodman, 2003; Renting et al., 2003; Tarditti, 2012). We understand AFN as new organisational structures that carry the potential for political transformation but also as institutional models that promote an alternative rural development paradigm, which in our case refers to the agroecological transition. AFNs involve SFSCs that promote and strengthen physical, social and cultural proximity, by establishing trust bonds and shared values related to the specific attributes of the food. Furthermore, as we are interested in the logistical challenges that urban food strategies involve, we take into account those works that specifically consider these issues (Belletti & Marescotti, 2020; Cendón et al., 2023).

3. Methodology

This study is primarily based on a qualitative-exploratory analysis regarding the urban food strategy and food system of the city of Gualeguaychú, located in the province of Entre Ríos, Argentina. Research involved the systematisation of first-hand interviews conducted with local agents, the examination of national census data and official municipal documents, and the review of specialised literature (Fig. 1).

These methods and sources were employed to characterise the local food supply system and its agents, to explain the challenges of the alternative food landscape, and to examine Gualeguaychú's urban food strategy. The investigation covered the period between 2018–2024, from its beginning to the more recent situation of uncertainty regarding the continuity of the food plan.

Figure 1. Gualeguaychú´s location in Argentina.

Regarding primary sources, we conducted 54 semi-structured interviews with a diverse range of 'food agents' in Gualeguaychú, to ensure that nearly all perspectives within the local food system were captured, with a focus on the fresh food sector (fruits and vegetables) because of its geographical proximity and importance for a healthy nutrition. We interviewed managers of retail stores (three), supermarkets (three), local farmers (seventeen), alternative food traders (three) and consumers (fifteen), qualified informants belonging to national agencies of rural development (nine) and policy makers of different administrations (four). These interviews were conducted between May 2022 and November 2024 and were transcribed immediately after fieldwork. Subsequently, they were analysed using Atlas.ti software through an initial coding of key concepts such as urban food strategy, food logistics, agroecology, and local production (with additional codes being incorporated as the analysis progressed). What is more, we constructed a typology of the actors that sustain the conventional and alternative food supply system.

In relation to the urban food strategy investigated, the Healthy, Safe, and Sovereign Food Plan (HSSFP), we carried out: i) an examination of the phases of the local urban food strategy with a sequential policy model approach that includes the description and analysis of the following processes: agenda-setting, problem definition and policy formulation, implementation, evaluation, and interruption; ii) a detailed review of institutional documents of the HSSFP comparing its guidelines and objectives, as well as its measures, with the Milan Urban Food Policy Pact framework for action, considered as the most developed agreement of urban food policies up to now.

4. The Urban Food System and Supply of Gualeguaychú

Given Argentina's role as a major commodity exporter, Argentine food policies in the last fifty years have tended to focus more on concerns about food security, locally framed as the impact of food prices on the socio-economic conditions of society, rather than on adopting a comprehensive approach to food issues (Barsky, 2020; Borrás, 2013; Craviotti, 2022).

Food policies have manifested through assistance programs to the poor population complemented with the regulation of the prices of key food items through direct intervention or the appellation to the possibility of importing food, according to the orientation of national governments. In spite of a main focus on food security, food sovereignty was also considered in some conjunctures (Blasich, 2020). There have also been programs oriented to support family farming, but they did not address the structural limitations of the sector, so the trend towards land concentration has persisted over time.

Most of these programs have been designed by the national level; the legal framework limits the capacity of the urban governments to carry out development policies. Nonetheless, one big Argentinean city, Rosario, has been able surpass these limitations, develop a globally recognized urban food policy[4] that stands out as an example for the region and leads the way in terms of urban agroecology and innovative food policies that include food sovereignty at its core (Lattuca, 2011).

Within Argentina, Entre Ríos—the province where Gualeguaychú is located—exemplifies a territory that was rapidly integrated into the global agribusiness framework, becoming a key producer of export-oriented commodities such as soy, corn, wheat, and more recently, poultry. This area, situated in the eastern edge of the Pampas plains, has shifted from being a livestock-agricultural to an agricultural-livestock area

[4] Despite having developed actions since 1989, Rosario joined the MUFPP in 2020 and holds, together with Belo Horizonte, the representation of South America in the MUFPP Central Committee. Due to its continuity, it is a well-known experience in international fora and has been awarded by the MUFPP in 2022 in the food production category. For more information see Dubbeling et al. (2016) and Tornaghi and Dehaene (2020).

(Crojethovich et al., 2012). According to Gualeguaychú´s municipal Habitat Secretariat (2022), "*the main crop, nowadays, is soybean, followed by wheat and corn, all cultivated using the direct seeding technology package and the use of chemical inputs*."

In any case, this integration into international commodity chains, which is neither unique nor original to Entre Ríos but rather reflects Argentina's re-primarized accumulation model (Svampa, 2013), underscores the interruption of the state-planned projects of the mid-20th century that aimed to modify the province's agrarian structure, through the establishment of agricultural colonies that would supply its cities with local food.

While food planning was marginalised within state action, several phenomena at the end of the 20th century and the beginning of the 21st century accelerated the decline of pre-existent regional and local horticultural belts. The growing urbanisation, the expansion of grain production, land concentration and the rise of supermarkets -usually multinational enterprises- pushed Gualeguaychú into food dependence.

> *"These processes of industrial agriculture have made it so that a working producer, whose main capital is his labour force, on an 80-hectare field, prefers to rent it out. So, that producer who 30 years ago had chickens, had a considerable vegetable garden with pumpkins is no longer there... (In that time) that production was sold locally."* (Agricultural historian from Gualeguaychú, personal communication, August 2023)

> *"We had a cooperative here, a cold storage plant, we were surrounded by farms, and we [the people from Gualeguaychú] could consume our local production."* (Consumer at a local alternative food retail shop, personal communication, 2022)

Currently, the provincial fruit and vegetable sector shows a poorly developed reality that forces the region to source externally up to 80% of its total demand of vegetables, according to estimates from the 2007/8 provincial horticultural census. Both state agents and qualified informants of Gualeguaychú (farmers, vegetable vendors and consumers) agree on two key issues: i) that the vast majority of fruits and vegetables consumed, except leafy vegetables, are not locally produced, highlighting the importance of the wholesale markets of Buenos Aires, Rosario, and Córdoba, situated at least 200 km. away; and ii) that during the early 2000s, many local farmers abandoned their activities.

> *"My father-in-law, who has worked in this (horticultural production), for 30–40 years, will tell you. There used to be more people producing and there was more local production."* (Farmer of Plaza Belgrano Farmers Market, personal communication, August 2023)

In this context, most of Gualeguaychú's fruit and vegetable supply is managed by various agents who employ different logistical and commercial strategies to ensure food provision. These agents can be classified based on whether they engage (or not) in wholesale redistribution, along with secondary criteria such as their logistics of supply, scale of operation, capital resources, and their sourcing of locally produced vegetables. Despite their diversity, the most significant actors are multinational supermarkets that rely on extra-regional distribution centres and local greengrocers, who control their own logistics, transportation and networks, and thus operate as wholesale distributors within the city.

The fact that these agents are almost entirely supplied with fruits and vegetables from external sources (being leafy vegetables the exception) and of conventional food systems of production that rely heavily on agrochemicals, exposes how Gualeguaychú is being fed. These features partly explain why the urban food strategy initiated in Gualeguaychú aims to achieve a sociocultural shift towards food quality—understood as a polysemic category that encompasses aspects such as nutrition, cultural rootedness, and locality— and to enhance local production, along with a strong emphasis on food safety and health.

5. Gualeguaychú´s Urban Food Strategy

Gualeguaychú´s urban food strategy: the Healthy, Safe, and Sovereign Food Plan (HSSFP), inadvertently began its journey by 2015 with an isolated practice of local food procurement of a short number of public facilities. By 2018 it consciously took a step forward with a highly contested normative disruption, an ordinance that placed a ban on the use of glyphosate. This action framed in health concerns, paved the way for a more comprehensive and constructive approach that regarded its local food system as an integral field of action and transformation that would include health at its core but would focus on food.

This integral approach, the food plan, was based on specific ideological flags — food sovereignty and agroecological production- that reflected the viewpoint of those who participated in the formulation process. With a somewhat clear roadmap that lacked quantitative data but demonstrated a statement of intent -to achieve an agroecological food system transition-, Gualeguaychú´s urban food strategy was officially established by 2021. In order to understand how and why this UFS was designed, how it was implemented, and with which actors, in the next paragraphs we follow the sequential policy model approach to further develop our critical examination of the policy.

A. How did "food" become a public policy in Gualeguaychú?

The local administration that would establish the HSSFP, reached the municipal government by 2015. These authorities were particularly bound to work on health issues as some of them, the mayor for instance, were healthcare

professionals themselves. This is why the incoming government platform included the project of establishing a local vegetable production, free of agrochemicals, to guarantee the local procurement of public facilities, specifically those for early childhood. However, the development of a comprehensive urban food strategy aligned with the idea of food sovereignty was not yet part of the agenda.

The Municipal Food Production Centre[5] was established by September of 2017 in 6 hectares that were obtained on a loan by the municipality. It´s management was commended to a cooperative organisation. Official data reveals that during its first 8 months, the project produced approximately 25 thousand kilos of vegetables such as: chard, parsley, squash, green onion, cucumber, beet, celery, cabbage, and melon.

This experience resembled more of a single-issue policy that focused on a targeted action than an integrated food strategy. However, this approach was bound to an early shift as the growing national, regional and local concern regarding illnesses (cancer being the most notable) connected to the excessive use of agrochemicals (glyphosate) in areas devoted to grain production sparked a nationwide dispute over the safety and sustainability of Argentinian food systems (Blois, 2017; Carrasco et al., 2012).

This national concern over agrochemicals was reflected in the emergence of a national movement that included the networking of social movements, academic researchers and professional associations of which the "Network of Fumigated Towns" was the most recognized (Berger, 2020). As their collective and grassroots actions sparked numerous municipal interventions in the Pampas region, which usually limited the range of use of agrochemicals (particularly glyphosate) within cities' limits, and Gualeguaychú´s society also had health concerns of its own, the situation nudged local authorities to push on this agenda.

The growing number of cancer diseases among local society and the infamous case of a child intoxicated by agrochemicals not only led to the conformation of a local organisation called "Stop Cancer", that orchestrated numerous mobilisations but also drove the local authorities to finance an epidemiological study of cancer.[6] The study found that, overall, the behaviour over time of cancer mortality rates in Gualeguaychú showed a relatively increased risk in the city but there was no relevant annual difference (between the city and what national statistics showed) in the total number of diagnosed cases.

Simultaneously, the local authorities strived to discover the elements that were causing cancer. According to the Health Office Director of the time, they found that the main reasons were issues related to food, water (its components), and, ultimately, the underlying production model that required lots of external inputs to function. What is more, they realised that Gualeguaychú lacked specific legislation for its predominantly rural areas (30,225 hectares of 33,000), despite them being most of the territory.

So, those internal reports and the results of the epidemiologic investigation, plus the society support, legitimised the decision to promote legislation- the same day the results of the report were publicly presented- to regulate and prohibit the existence of glyphosate in the city: the Ordinance Nª 12.216/2018. At this point, as the focus of the issue was shifting towards the characteristics of the local food system, local authorities began to consider the option of formulating a comprehensive urban food policy. To do so, the ecologist[7] blueprint of the local authorities led them to convene various food-related experts from other areas of the country closely linked to the food sovereignty movement to develop and steer an action plan.

With this joint vision, that did not include every local food stakeholder nor relied on a detailed background and baseline research, the Healthy, Safe, and Sovereign Food Plan (HSSFP) began to be conceived and designed.

> *"It's useless to change the entire production model—stop spraying poison on the population, care for the air, the soil, and the people—if you're still eating poorly. If food doesn't become the essence of life, the effort is wasted. Eating junk and unhealthy food doesn't just lead to hunger and malnutrition; even children from wealthy families suffer from poor nutrition. In other words, focusing on only one aspect isn't enough. You could change a community's diet—if that were possible based solely on intentions—but if the surrounding environment remains contaminated with substances like chlorinated compounds or other harmful chemicals, the impact will be limited."* (HSSFP coordinator, personal communication, August 2023)

So, this process of agenda setting demanded a thorough political action. As we have seen, the first intervention involved the ban of glyphosate and established itself as the first legislative precedent (in 2018) of the future urban food strategy that would not be enacted until April 2021. However, during that period, several other local legislations related to food issues were passed: the declaration of municipal interest in family agriculture (2020), the municipal adherence to Sustainable Development Goals (2020) and the incorporation to the National Network of Municipalities and Communities that promote agroecology (RENAMA) in 2021, being the most notorious.

[5] In Spanish: *Centro de Producción de Alimentos Municipal.*

[6] The study evaluated cancer incidence between 2000 and 2011 and mortality between 2000 and 2015.

[7] Dating from the international pulp mill conflict that developed in Gualeguaychú in the mid-2000s (Merlinsky, 2008).

Table 1. Alignment between food sovereignty principles and the healthy, safe, and sovereign food plan (HSSFP)

Food Sovereignty principles from La Via Campesina (1996)	HSSFP measures
Agrarian reform	Create an agroecological colony by loaning municipal owned land to a farmer´s organization
Protecting natural resources	Ban glyphosate, promote agroecology, create a bio-factory
Reorganizing the food trade	Promote short food supply chains and build a Municipal Market
Democratic control	Establish a multi stakeholder food policy council and specific sectoral boards

Source: Own elaboration based on official documentation of the HSFPP.

These municipal ordinances laid the institutional and political groundwork for the comprehensive agro-food policy that was taking shape. They also hinted at an emerging human rights-based approach that would become the cornerstone of the plan, which was complemented by a strong emphasis on food sovereignty.

B. The Healthy, Safe, and Sovereign Food Plan: A holistic strategy

The HSSFP was institutionalised through a municipal legislation that included a series of official comprehensive strategic documents through which the general framework of the program and its formulation was communicated. The strategic document contained: the rationale, objectives, target audience, scope, and lines of action. The rationale was supported by two central principles: i) that food was a human right and that the State—in all its levels—had the obligation to guarantee accessibility; ii) that the primary food production system was in crisis and required an intervention to enable a transition to agroecological production processes that promote human well-being and environmental conservation.

Reading those documents, the HSSFP, already from its name and its strong emphasis on food as a basic human right, aligned itself with the ideals of food sovereignty. The fact that many of its measures line up with the food sovereignty principles from La Via Campesina (1996), as shown in Table 1, evidence this viewpoint. The plan appealed to ideals of food justice that include the democratic participation of all stakeholders and the conservation and restoration of ecological systems.

To achieve these purposes and follow those principles, the objectives of the UFS were grouped into four thematic fields: a) Production, processing, and commercialisation; b) Environmental awareness and responsible consumption; c) Training and knowledge; d) Communication. These thematic fields were integrated by sub-items such as: a.i) Promotion of the local production of pesticide-free foods; b.i) Generation of responsible consumption habits and healthy eating throughout the local population; c.i) Research projects on the local production system, readiness for transition, interests, and demands of the sector; d.i) Creation of an observatory of production and healthy eating with local, provincial, and national experiences and a food policy council.

Programmatically, to organise the achievement of the proposed objectives, the plan was structured through five lines of action: i) Research; ii) Training; iii) Advisory and production; iv) Communication; v) Articulations and alliances.

These lines of action represent the paths for the implementation of the policy. They fulfil the same ordering function as the strategic action framework of the MUFPP by guiding the implementation process. Regarding the target audience and scope of the policy, they aim to operate over the whole department of Gualeguaychú and remain consistent with the notion of sustaining a public policy aligned with the Sustainable Local Development goals.

C. How was the HSSFP implemented?

The implementation is considered the materialisation phase of the policy and, therefore, the essence of any public policy. While this phase constitutes the effective execution of tasks it also includes monitoring and evaluation work and may also include the actions prior to the sanction of the plan, such as the "glyphosate ban", because they specify policy goals and provide political support. What is more, the responsibilities to oversee and develop the policy should be established during this phase.

The enactment of the HSSFP explicitly stated in Article 3 that the Secretary of Social Development, Environment and Health was entrusted with executing the policy. However, it was also stated in Article 4 that the HSSFP must be transversal to all areas. This approach was meant to enhance "Horizontal city-level governance" (one of the urban food policies enabling factors according to Hawkes and Halliday, 2017) and to include several departments engaged with and committed to the policy.

> *"The HSSFP is transversal (horizontal) to all departments. The HSSFP is integrated by the departments of production, environment, bromatology, veterinary medicine, social development, health, and social economy."* (Bromatology Department Member, personal communication, August 2023)

Table 2. Food matrix

Type of production	Origin of production		
	Gualeguaychú	Regional	National
Agroecological	Local labour+healthy food	Regional labour+healthy food	Healthy food
In transition to agroecological	Local labour	Regional labour	
Agroindustrial	Local labour	Regional labour	

Source: Own elaboration based on official documentation of the HSSFP. HSSFP: Healthy, safe, and sovereign food plan.

Despite the virtue of this approach, its execution proved to be too horizontal to actually strengthen the implementation of practices, as there was no specific governance body structure of the HSSFP to ensure accountability, nor did external stakeholders (outside the municipality) have clarity about the main institutional actors of the policy. That is why eventually the policy found its institutional place at the Environmental department.

> *"At first, the HSSFP was very transversal to the municipal government due to the complexity of the program. In other words, we (nutritionists, food scientists, administrators, etc.) understood that we were all contributing to making healthy, safe and sovereign food. The perspective was to understand life from another place, to "imitate" how the "monte" (forest) works. That (transversality-horizontal governance) was a virtue, without a doubt, but we (local governments and authorities) are not prepared to work with that scheme. Then, a year or two later, it (the HSSFP) had to be anchored."* (HSSFP coordinator, personal communication, August 2023)

After addressing the governance of the policy, the plan's roadmap required budgeting and further clarification. Regarding funding, the plan received a national endowment for nearly 200.000 dollars and obtained 185.000 dollars via the municipal budget in 2022. Regarding clarification, conceptual tools like "scenario construction" are often employed during implementation to guide actions, and in Gualeguaychú, this framework was effectively applied. Using a rapid assessment, the municipality's technical teams developed a food matrix (Table 2) that mapped the geographical origin of food consumed in Gualeguaychú. This matrix served as the foundation for defining the "base scenario" of the local food system and envisioning a "desired scenario" to guide the UFS efforts.

The trajectory from the "*Supply and consumption of national and agro-industrial food production*" (considered the "baseline" scenario, as informal official data suggests that only 5%–8% of food was produced locally), to the "*Supply and consumption of local and agroecological food production*" situation (considered to be the "desired" scenario) was meant to include the passage through intermediate stages of regional food production (hence, moving from the right bottom quadrant in red to the upper left quadrant in green) that were also considered an improvement of the initial scenario.

Moreover, that progression, and every other practice within the food plan for that matter, also took into account the estimation of how much food the department required to be fed. For that purpose, according to the dietary official guidelines for the Argentine population, Gualeguaychú needed per month: 1,200,000 litres of milk and yogurt, 72,000 kg of fresh cheese, 100,000 dozen of eggs, 312,000 tons of meat, 960,000 kg of vegetables, 720,000 kg of fruit, 72,000 kg of oil, seed and dried fruits, and 4,800,000 litres of safe water.

Even though the food demand estimates were more a declaration of intent than an actual achievable goal, every practice and measure carried out had in its core the idea of shortening the distance between the baseline and the desired scenario. Therefore, the main practices of the UFS were aimed at increasing the volume of local produce and strengthening commercialisation (and healthy consumption) through short food supply chains. Within the first realm, the creation of an agroecological colony was the key initiative (arguably the most important project of the policy), alongside a Participatory Local Agroecological Guarantee System that could not be established. The opening of a Municipal Market represented the main effort in terms of food supply and distribution.

Regarding the agroecological colony, its construction began with the decision (disputed by environmentalist groups and political opposition) of developing agroecological production sites in a municipal-owned natural reserve called "Las Piedras", that was previously loaned to private users.[8] The local authorities decided to reorganise the use of these 300 hectares and destinate 60 to agroecological production (and let the rest for conservation purposes) complemented by the instalment of a biofactory to supply organic inputs to the producers of the colony and other areas of Gualeguaychú. This biofactory produced up to eight thousand liters of bioles[9] annually since 2020.

[8] Who developed a racetrack venture and established an agrarian school.

[9] Liquid fertilizers made from whey and bovine manure, essential inputs to ensure agricultural production without agrochemicals.

> *"The challenge of conserving and producing, and producing while conserving, was an interesting objective."* (HSSFP coordinator, personal communication, August 2023)

To do so, the municipality signed a management agreement in 2021 with a farmer organisation, the "Union of Land Workers (ULW-UTT),[10] notable for its agroecological and food sovereignty viewpoints that vindicate a national land reform (Acero Lagomarsino, 2022; Sotiru, 2021). The ULW-UTT was "loaned" with 15 hectares of land to be worked by 10 farmer families belonging to the organisation. The referred agreement also included the municipal commitment to build houses for these families (on additional land inside the conservation area). ULW-UTT farmers assumed the compromise of delivering 20% of its produce to public facilities. However, as the main members of the organization are farmers of the Buenos Aires horticultural belt, this meant that the members of the colony would not belong to Gualeguaychú. This would later prove to be a problem as local stakeholders felt undervalued within the UFS.

Despite the colony's primary focus on horticultural production, it was sought to include egg, fruit, and honey production, along with regenerative livestock. While the project initially benefited from national and municipal funding, as well as political support, after two years of operation it only managed to cultivate three hectares of horticulture (with the labour of two farmers that established themselves in "Las Piedras" during 2020) and to hold, discontinuously, a mobile chicken coop for 200 chickens. Despite the lack of houses (they were never constructed) being a big factor of these shortcomings, other issues also took their toll.

> *"It's a combination of things: working with the municipality is slow; in Gualeguaychú, summers are extremely hot, and lettuce gets scorched, while in winter, it's very cold, so lettuce, chard, and beets also suffer from frost damage; accessibility to Las Piedras is impossible when it rains; most farmers want to have dogs, but here, it's not feasible; waste management is another issue—there's a habit of separating waste here. So, starting a farm from scratch in a new province is quite a big challenge."* (ULW Farmer in Gualeguaychú, personal communication, June 2022)

Furthermore, the ULW, the managing organization, faced challenges to allocate sufficient resources and attention to the colony, as it was engaged in multiple advocacy efforts at national, regional, and local levels due to its rise in public and political exposure amid high-level national political commitment during the period of 2019–2023. Nevertheless, compounding these issues, a political shift in 2024 led to reduced backing from authorities, halting progress during a contentious election year.

This process reveals the coexistence of two contrasting policy implementation perspectives. On one hand, it can be seen as a bottom-up initiative, given its alliance with a national stakeholder that represented and advocated for the demands of small agroecological farmers: the ULW-UTT. On the other hand, local stakeholders perceived it as a top-down, vertical practice, feeling excluded from the process and viewing the new, "foreign" actor, as disproportionately prioritized, although support to local horticultural farmers was also given, and a cooperative of local producers was also created with the help of the local government.

Lastly, the HSFPP also promoted community gardens through advice and training workshops, assistance with tools and biological inputs, and seed and seedlings distribution alongside the National Institute of Agricultural Technology. At some point during 2020 there were up to 500 vegetable gardens functioning in the city according to the authorities interviewed.

> *"We work with different types of gardens because there are institutional gardens—such as those in health centres or schools—that serve an educational or social support purpose; family gardens; and collective-process gardens, such as community-popular gardens. Or even the biopark [Colonia Las Piedras], which works similarly to Rosario´s community gardens."* (Member of the Social Economy department, virtual interview, November 2022)

When it comes to food supply and distribution, two main practices were implemented: the establishment of the "Nutrir Program", and the promotion of alternative short food supply chains of which the creation of the Municipal Market was the main accomplishment.

The *Nutrir Program* (now called *IgualAR* under the new administration) is a state-funded initiative that began in 2021. The municipality provided a registered credit card, loaded with either 25,000 or 60,000 Argentine pesos,[11] to 2,150 low-income families in 2023 to enhance food security. Eventually, the Nutrir team managed to incorporate the Municipal Market into the stores that could accept the Nutrir card, nudging the recipients towards the adoption of more sustainable diets. But they could not convince farmer´s market members to get a bank account and be able to accept the card instead of cash.

Regarding the enhancement of short food supply chains, its goal was to facilitate the commercialisation of local production directly from its producers; hence benefiting local farmers and guaranteeing the physical and economic access of agroecological food to local society. The HSFPP input was to guide on bromatological and productive issues, and counsel on the procurement of funding, apart from guaranteeing a public space for the farmers markets and providing sponsorship and publicity.

[10] In Spanish: *Unión de Trabajadores de la Tierra*.

[11] Approximately 86 and 205 US dollars monthly considering the official exchange rate annual average.

As a matter of fact, the establishment of short food chains has been notable in the city. A new farmer market that involved the participation and strengthened the work of three new agroecological farmers[12] was set up in 2021 (the Belgrano Square Agroecological Farmers Market) and a food cooperative that holds an agroecological and social economy approach was formalised in 2021 (Demicheli & Craviotti, 2023). Additionally, the Municipal Market was launched at the end of the same year. These three new agroecological experiences added up to the pre-existing Green Farmers Market -whose three farmers[13] began an agroecological transition under the HSFPP and together multiplied the availability of spaces for purchasing healthy and mainly locally produced food.

These AFN show diversity from the organisational point of view (direct marketing from the producers, initiatives managed by solidarity intermediaries and a state-managed producer-to-consumer market) and regarding the qualities of food they sell. Food may be organic, such as the "yerba mate" offered by Ñande cooperative; agroecological, like the vegetables at Belgrano Square and the fruits at the Municipal Market; transitioning to agroecological, as the vegetables at the Green Farmers Market; or conventionally produced by a cooperative, like the rice and pasta sold at the Municipal Market.[14] But, aside from seasonal vegetables, most of these products are predominantly sourced from non-local producers, accessed through urban agroecological operators located in Buenos Aires wholesale market. These nonlocal agents guarantee a continuous supply throughout the year of certain types of agroecological, organic, and/or cooperative food. Thus, coordination with these actors allows the local AFN to expand their food offering to consumers and specialized wholesalers stand out as critical agents from the logistical point of view (Craviotti & Demicheli, 2023).

Finally, in other areas of the food strategy, although the HSSFP envisaged actions related to research, communication, food waste and organising stakeholder participation- results have been somewhat limited. When it comes to research and communication, two scientific congresses on food, agroecology, and food sovereignty were held to share the achievements and raise awareness. Regarding food waste, the "EcoPark", a waste separation plant founded in 2014, managed to process approximately five tons of food waste per week at its peak. Finally, regarding the "horizontal" city level governance, while there have been efforts to establish sectoral stakeholder boards to swiftly introduce the idea of forming a food policy council, these initiatives did not materialise into a consolidated entity. As a result, the UFS reflected more of a top-down approach with little horizontal governance or participatory multi stakeholder processes, a key aspect to develop rootedness in the local society.

D. The interruption of the UFS

In the case of the HSSFP, an institutionalised evaluation -that should allow the understanding and analysis of the impacts and results of the policy-, whether qualitative, quantitative, or mixed, has not been developed and no indicators have been constructed. Similarly, the UFS has not reached an official reformulation phase, even though many practices were transformed and adjusted permanently. The primary explanation for these shortcomings lies in financial constraints, inadequate participatory policy processes, scarce data collection, political timing, insufficient institutional capacities and, most notably, the change in municipal leadership following the 2023 elections.

In fact, the administration that implemented the HSSFP failed to secure re-election, and an ideologically opposed party assumed power, choosing not to continue the policy. As a result, many initiatives that were incorporated into the food plan documents were left incomplete or never initiated at all.

Why did the HSSFP come to a halt? There are several reasons that explain this decision: i) there was a change in the political atmosphere at the national, provincial and municipal sphere, implying a shift towards neoliberal-conservative approaches. New authorities do not "believe" in agroecology as a valid, comprehensive food system approach, nor do they think the current food system is in crisis; ii) the new government has stronger ties to agribusiness stakeholders, as evidenced by their sponsorship of the revocation of the glyphosate ban in October 2024; iii) the HSSFP did not have enough support from local society nor productive stakeholders; iv) the agroecological colony did not show sufficient progress, and v) the Municipal Market was unable to establish itself as a regular destination for neighbours to purchase food (it was located too far away from the city centre) even though eventually, it established a program called "The Market in your neighbourhood" to tackle the challenge of making agroecological food accessible for the low-income families.

6. A Hidden Urban Food Strategy?

Now we can answer one of the main questions we asked in the Introduction. How did this Argentinian UFS relate to an international city food network such as the Milan Urban Food Policy Pact? Argentinian cities, with the notable exception of Rosario, have not been too interested in being part of the new international food agenda nor in constructing Latin American city food networks. Despite this fact, the MUFPP appears to be the main stage of participation as nine (9) Argentinian cit-

[12] Each of these farmers produce on one hectare of land.

[13] Each of these farmers produce on two hectares of land (Demicheli & Craviotti, 2023; Pérez, 2020).

[14] These categories are not mutually exclusive—food can be both agroecological and cooperative, highlighting the intersection of sustainable practices and collective efforts.

Table 3. Actions of the HSSFP in terms of the MUFPP framework

HSSFP framework for action	Actions - HSSFP	N° actions of the MUFPP
Production, added value, and commercialisation	Promote local production of pesticide-free foods.	20° - Promote and strengthen urban and periurban food production based on sustainable approaches.
	Strengthen and add value to the primary production of healthy foods.	24° - Help provide services to food producers.
	Encourage the development and economic viability of short food supply chains that allow safe access to healthy foods.	25° - Support short food chains. 32° - Expand support for infrastructure related to food market systems.
	Contribute to the understanding of climate change, its causes and consequences, and the mitigation and adaptation measures of the production practices.	34° - Convene food system actors to assess and monitor food loss and waste. 35° - Raise awareness of food loss and waste.
Environmental community and responsible consumption	Create responsible consumption and healthy eating habits among the entire local population.	7° - Promote sustainable diets and nutrition.
	Empower organisations and social groups in Gualeguaychú committed to environmental care and sustainable development.	2° - Enhance stakeholder participation.
	Influence the food supply and diets habits of public schools that have cafeterias.	30° - Review public procurement. 15° - Reorientate school feeding programmes.
Training and knowledge generation	Study of risk perception and vulnerability of different social sectors of the Gualeguaychú population.	8° -Address diseases associated with poor diets and obesity.
Communication	Create an observatory of "health and nutritive production" with local, provincial, and national agents.	5° -Develop multisectoral information systems.
	Generate networks of responsible producers and consumers.	18° - Promote networks and grassroots activities.
	Offer training and peer to peer exchange opportunities on addressing environmental issues in the media.	19° - Promote education, training and research.

HSSFP: Healthy, safe, and sovereign food plan; MUFPP: Milan urban food policy pact.

ies have signed it,[15] even though, for the most part - if not entirely - they exhibit specific practices (working on one or two categories of the framework for action) or do not have a practice at all (almost 50% do not have a practice).[16]

However, we have argued that this is not the whole reality as Gualeguaychú had an urban food strategy although the city did not sign any international agreements, meaning it operated behind the scenes of the international city food network. So, given that the MUFPP is the most influential city food network in Argentina and probably of the world, how can we situate the HSSFP's strategy, compared to the MUFPP's framework for action? Could a significant difference between the two approaches be the reason why Gualeguaychú opted not to sign the pact or join any other international food network?

The results presented in Table 3 show that the framework for action of the HSSFP and the MUFPP were actually aligned. As previously stated, Gualeguaychú´s UFS presented (although not always completely addressed) actions that relate to all the practice categories (6) the MUFPP proposes as framework for action: Governance, Sustainable diets and Nutrition, Social and Economic Equity, Food Production, Food Supply and Distribution and Food Waste. We can identify various measures the HSSFP implemented that aligned with the MUFPP actions:

- HSSFP creation of an agrarian colony - agricultural park- sustains MUFPP action N° 23 "*Protect and enable secure access and tenure to land for sustainable production in urban and peri urban areas*" (Food production).

[15] Tandil- Esteban Echeverría - San Antonio de Areco - Ciudad Autónoma de Buenos Aires - Rosario - Santa Fe - Córdoba - Godoy Cruz - Río Grande.

[16] According to the MUFPP official website, the following signatory cities do not present any practice at all: Tandil, Esteban Echeverria, Santa Fe and Godoy Cruz.

- HSSFP construction of a biofactory to supply organic inputs to producers may be included within MUFPP action N° 24 "*Help provide services to food producers*" (Food production).
- The fact that HSSFP was envisioned as transversal to all management and institutionalised via municipal legislation, relates to MUFPP action N° 1 "*Facilitate collaboration across city agents and departments*" (Governance).
- HSSFP "Nutrir program" (a registered credit card containing state funds to spend on food) to support food security and nudge consumption towards healthy choices is essentially, MUFPP action N° 14 "*Use cash and food transfers*" (Social and economic equity).

Then, what could have been the reasons for opting to not engage with the MUFPP or any other city food network? According to the local authorities interviewed -coordinators and members of the HSSFP- there were at least three (3) reasons that explain this:

I. There was a strong desire to build on local methodologies with local and national experts, creating distance from external influences to foster independence and sovereignty.
II. Reflecting on external experiences from other cities was not part of the formulation process, even though the individuals that participated in them may have had references about some of them. Consequently, worldwide urban food strategies experiences were mostly unknown or at least not clearly incorporated into the strategy.
III. There was a sense of alert or aversion to joining supranational institutional frameworks as those highly institutionalised arenas were viewed as instruments for the "maintenance of the status quo". They were understood as strengthened by organisations that do not belong to the Global South which, to accept participation may require to compromise or to agree on certain issues that local authorities may be resistant to accept.

So, joining a highly institutionalized network, such as the one sponsored by the FAO, was not even considered an option. Their decision was not a rejection of the MUFPP itself but rather a refusal to engage with the international urban food policy arena. Instead, they chose to remain "hidden."

As stated before, the reasons they remained "behind the scenes" of international city food networks and urban food policy arenas were primarily ideological, rather than pragmatic or operational. HSSFP's commitment to principles of social justice, agroecology, and food sovereignty may be seen as values that serve as banners of resistance and alternatives strongly tied to social movements from the Global South. These principles are less integrated into the urban food strategies of the Global North (Smaal et al., 2021). This ideological positioning helps to explain the reluctance of key local actors to engage with institutions perceived as colonialist organizations of the Global North, reflecting a conscious effort to prevent institutional co-optation (Altieri & Nicholls, 2012; Giraldo & Rosset, 2016; Laforge et al., 2017). This perspective suggests that the Global South may serve as a more likely host for these "hidden" UFS—a line of inquiry that warrants further exploration.

Then, should the South build its own city food networks or overcome differences and join these global structures? Which would be the pros and cons of both alternatives? Whatever the answer might be, as recent as 2024, a new network called "Intermediate cities and food systems network",[17] has been leading the way in the South. However, as this new network holds sponsorship from supranational institutions like FAO, concerns about external influence and control may persist.

Lastly, while we can only speculate whether signing the MUFPP or joining any city food network would have ensured a better implementation of the food strategy, the acquisition of additional funds, or, most importantly, the continuity of the policy—a key factor for the success of food policies, often defined as "political commitment that transcends electoral cycles" and "participatory policy process" (Hawkes & Halliday, 2017)—integrating this kind of networks could have been beneficial, at least, for strengthening the evaluation phase. This could have been achieved by adapting the MUFPP's indicators to align with local characteristics. Ultimately, a crucial question arises: does joining a city food network truly guarantee the continuity of urban food systems?

7. Conclusion

Having begun the paper by showcasing—and perhaps aiming to highlight—southern urban food strategies in intermediate cities that rely on the functioning of alternative food networks, we found that in Gualeguaychú there is still a predominance of a strongly consolidated, conventional food system that does not necessarily value food as the *grand social connector* we believe it to be.

At first glance, recognizing the hegemony (in terms of capitalization, impact, scale, and presence) of conventional circuits might be disappointing for the *sitopic* reader. However, this analysis has also allowed us to acknowledge the existence of alternative, agroecological marketing experiences that increasingly incorporate the participation of traditional and emerging local horticultural producers, who despite the interruption of the UFS continue to operate. The strengthening of these actors in a context mediated by the precedent, almost unique in our country, of an urban food strategy grounded in a human rights and food sovereignty perspective needs to be recognized and valued.

[17] In Spanish: *Red de Ciudades Intermedias y Sistemas Alimentarios*.

Gualeguaychú´s HSSFP aimed "*towards the progressive realisation of local food sovereignty*" through the implementation of a five-dimension framework for action and outlined a series of practices that encompass all the lines of action proposed by the Milan Urban Food Policy Pact (MUFPP). As it also introduces the urban environment as the primary territory of intervention, we may conclude that the HSSFP qualifies as an Urban Food Strategy that effectively aligns with many of the objectives set by the MUFPP.

Nonetheless, this alignment did not translate into networking with the MUFPP or with any other city food network. As this decision appears to be intentional -due to ideological reasons-, we qualify it as a "hidden urban food strategy". In a first stance we wondered whether this political and symbolic decision was worth it or if ideology outweighed the practical benefits of joining a global alliance that guarantees international legitimacy to certain local processes and could potentially ensure the continuity of a project, making it more resistant to municipal electoral cycles. Now, recognizing the interruption of the policy, that question remains unanswered and more relevant than ever.

In this sense, even though we cannot guarantee that being part of a food network is a sufficient condition to ensure the continuation of UFS, we do think that promoting a better and true involvement of local actors in the design and implementation—allowing them to have a voice and negotiate with external stakeholders—helps to sustain a policy. Having monitoring indicators also contributes by enabling the systematization of results and making them visible for the community and for the incoming authorities.

When it comes to its implementation, the HSSFP was analysed in line with the "*public policy cycle*" theory, though it did not complete all the phases. The proponents of the HSSFP clearly identified a problem to be addressed: the existence of a food production model in crisis, and they consciously incorporated it into their political platform. From that point onwards, they simultaneously advanced in the formulation, enactment and implementation of the policy despite the numerous challenges (not always surpassed) presented: the establishment of a multistakeholder policy process to improve food democracy, the elaboration of adequate monitoring mechanisms, the collection of data to make the right technical decisions, and finally the ability to surpass political discrepancies.

Despite its drawbacks, many implementation measures have been successful and stand out as significant policy achievements. These include the growth in the number of local agroecological farmers -although still low-, the establishment of some alternative marketing spaces where local producers can sell at fair prices, the improvement of consumer access to local and agroecological food, and the creation of an agroecological colony -agricultural park- (now dismantled). Additionally, while the institutionalization of the UFS and food-related legislation made the policy legally binding and was a significant milestone, it ultimately proved to be insufficient.

Regarding the AFN in Gualeguaychú, even though its supply depends partly on food produced in other regions and despite the lack of quantitative data to fully understand the impact of such alternative food experiences and their potential to scale up agroecology in all its dimensions, the presence of different short and alternative food supply chains remains significant because, as Glanz et al. (2005) observed, *"the availability of spaces for purchasing 'healthy/local' food defines a food environment, which in turn affects eating habits"*—a critical element in building a more liveable, just, and healthy reality.

All in all, weighing the contributions and limitations of the HSSFP, the promise of building a fairer, healthier, and more sovereign food reality remains within reach through urban food policies—provided they maintain continuity over time. This potential persists even when these policies develop outside international frameworks and take shape in the Global South. However, continuity and impact are not guaranteed by institutionalization alone. The experience of Gualeguaychú underscores that meaningful, long-term transformation depends on deep local engagement, adaptive governance, and mechanisms that ensure resilience beyond political cycles. If urban food strategies are to be truly transformative, they must not only secure legal recognition but also cultivate strong social foundations that empower local actors to sustain and expand their efforts. The engaged actors in cities like Gualeguaychú exemplify this possibility, demonstrating that even in challenging contexts, alternative food networks and agroecological movements can endure and inspire broader systemic change.

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Planlama 2025;Supp(1):74–88 | doi: 10.14744/planlama.2025.90582

ARTICLE / ARAŞTIRMA

"Hidden" Urban Food Strategies: Working "Behind the Scenes" of the International Food Networks from the Global South

"Gizli" Kentsel Gıda Stratejileri: Küresel Güney'den Uluslararası Gıda Ajandasının "Sahne Arkasında" Çalışmak

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ABSTRACT

Urban food strategies have gained significant attention in recent years, particularly those rooted in the Global North and embedded within international networks like the Milan Urban Food Policy Pact. However, this focus has created a research gap in understanding urban food strategies in the Global South, especially in Latin America. Additionally, there is limited exploration of "hidden" urban food strategies that operate outside these international frameworks. This paper investigates such a strategy in Gualeguaychú, an intermediate city in Argentina, which is developing an urban food policy independent of international agreements. Emphasising food sovereignty and alternative food networks, Gualeguaychú's approach offers a unique case to explore how local urban food policies function, the challenges they encounter, and their alignment—or lack thereof—with global food policy frameworks.Through a qualitative-exploratory analysis, this study reviews institutional documents using a public policy analysis framework and examines the city's predominant food supply system alongside its alternative food networks. The findings reveal Gualeguaychú's efforts to reduce dependence on imported food by expanding short food supply chains and implementing redistributive land reforms, aiming to strengthen its local food system. This paper highlights the po-

ÖZ

Kentsel gıda stratejileri son yıllarda, özellikle Küresel Kuzey'de kök salmış ve Milan Kentsel Gıda Politikası Paktı gibi uluslararası ağlarla entegre olan stratejiler büyük ilgi görmüştür. Ancak, bu yoğun ilgi, Latin Amerika gibi Küresel Güney'deki kentsel gıda stratejilerinin anlaşılmasında belirgin bir araştırma boşluğu yaratmıştır. Ayrıca, bu uluslararası çerçevelerin dışında işleyen "gizli" kentsel gıda stratejileri üzerine yapılan araştırmalar oldukça sınırlıdır. Bu makale, Arjantin'in ara şehirlerinden biri olan Gualeguaychú'da, uluslararası anlaşmalardan bağımsız olarak geliştirilen bir kentsel gıda politikasını incelemektedir. Gualeguaychú'nun yaklaşımı, gıda egemenliği ve alternatif gıda ağlarına vurgu yaparak, yerel kentsel gıda politikalarının nasıl işlediğini, bu politikaların karşılaştığı zorlukları ve küresel gıda politikası çerçeveleriyle ne ölçüde uyumlu olup olmadığını keşfetmek için benzersiz bir vaka sunmaktadır. Niteliksel ve keşifsel bir analiz çerçevesinde, bu çalışma kamu politikası analiz çerçevesini kullanarak kurumsal belgeleri incelemekte ve şehrin baskın gıda tedarik sistemi ile alternatif gıda ağlarını değerlendirmektedir. Araştırmanın bulguları, Gualeguaychú'nun ithal gıdaya bağımlılığı azaltma, kısa gıda tedarik zincirlerini genişletme ve toprak reformlarını uygulama çabalarını ortaya koymaktadır. Bu makale, kentsel gıda politikalarının uluslararası çerçevelerin dışında da gelişme potansiyelini

Received: 29.08.2024 Revised: 18.02.2025
Accepted: 07.06.2025 Available online date: 26.08.2025
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TMMOB Şehir Plancıları Odası

tential for urban food policies to evolve outside international frameworks, offering new perspectives from the Global South. Gualeguaychú's experience underscores the importance of local context in shaping urban food strategies and contributes to the broader discourse on food policy innovation.

Keywords: Agroecology; alternative food networks; intermediate cities; local food systems.

vurgulamakta ve Küresel Güney'den yeni perspektifler sunmaktadır. Gualeguaychú'nun deneyimi, kentsel gıda stratejilerinin şekillenmesinde yerel bağlamın ne kadar önemli olduğunu ortaya koymakta ve gıda politikası yeniliği üzerine genişleyen küresel tartışmalara önemli bir katkı sağlamaktadır.

Anahtar sözcükler: Agroekoloji; alternatif gıda ağı; ara şehirler; yerel gıda sistemi.

1. Introduction

The approach to the fundamental importance of food as a universal right and a biologically, socially and culturally necessary element is articulated with the rise of a new food equation that responds to "*the growing concerns about the security and sustainability of the agri-food system*" (Morgan & Sonnino, 2010). Social movements, and some strands of academia and political parties have been pushing this "food agenda" as a priority problem for urban policies in terms of urban food planning. This operational and conceptual approach, which is being increasingly institutionalised, operates within the frame of Food Security, the human right to adequate food and, most notably in some parts of the Global South, with a Food Sovereignty approach which, unlike the previous ones, emphasizes the right of the people to decide their food policies (Bernard et al., 2012; Beuchelt & Virchow, 2012; Cabannes et al., 2018; Holt-Giménez, 2017; López-Giraldo & Franco-Giraldo, 2015).

In this emerging new urban food agenda, the involvement of local governmental agencies in promoting local food supply systems has gained new momentum (Zerbian et al., 2022). This trend has been noted by several authors as the "*rise of municipalities*" in food policy reform (Mansfield & Mendes, 2013; Morley & Morgan, 2021) and has been developed, increasingly, through the emergence of the so-called urban food strategies (UFS). Because of the rapid population growth they are experimenting, especially in the Global South, small and intermediate cities have acquired renewed importance in the construction of ecologically and socially responsible agrofood projects (Civitaresi et al., 2019; FAO, 2019; O. López, 2024). These types of areas are considered to be key players in addressing food system challenges that create more sustainable foodscapes (Hawkes & Halliday, 2017; Manzano & Velázquez, 2015; Moragues-Faus, 2021).

However, the primary arenas for research and experimentation regarding urban food strategies have been the cosmopolitan cities of the Global North (Blay-Palmer, 2009; Ilieva, 2016; D. López et al., 2018). The latter have also been the main actors of the emergence of an innovative urban food policy cross-scalar tool: the city food networks (Milan Urban Food Policy Pact, C40 and CITYFOOD, to name a few) that rely on cross-fertilising knowledge and experiences in order to reinforce a "*global system of sustainable food systems*" (Blay-Palmer et al., 2016; Moragues-Faus, 2021).

Due to its scale, impact and global reach the most important landmark of these international - and institutional - agreements has been the Milan Urban Food Policy Pact (MUFPP).[1] As its official webpage states, the pact is committed "*to develop sustainable food systems that are inclusive, resilient, safe and diverse, that provide healthy and affordable food to all people in a human rights-based framework, that minimize waste and conserve biodiversity while adapting to and mitigating impacts of climate change*." The MUFPP is a concrete working tool that includes 37 recommended actions grouped in 6 categories and operates by fostering city to city cooperation and best practices exchange.

As we have suggested, northern cities not only showcase the most notable UFS, but they also host the headquarters of these key city food networks. As a result, those experiences are the most studied by scholars, leaving a gap in the study of urban food strategies in the Global South, particularly in Latin America. Argentina, for instance, has nine signatory cities of the MUFPP, including Rosario as one of the most advanced cities in terms of urban agroecology, but in most cases, there is no apparent comprehensive urban food strategy to account for. Nonetheless, Gualeguaychú, a city of 130,000 inhabitants internationally recognized for its environmental movement,[2] seems to be the scene of what Morgan (2009) considers a food planning movement, strengthened by an urban food strategy: the Healthy, Safe, and Sovereign Food Plan (HSSFP).[3]

Through a series of initiatives, like the creation of an agroecological colony and the promotion of Alternative Food Networks, the plan "*tends towards the progressive realization of local food sovereignty*". However, notably enough, this city has not signed the MUFPP nor has linked with any city food network. Hence, it remains "hidden" from the international food planning community.

[1] Signed by 290 cities by the beginning of 2025. Some key actors for the installation of common interpretative frameworks, grouped around joint projects of FAO and the RUAF Foundation, were involved in the design of the Milan Pact, actively disseminated by FAO.

[2] In 2003, the construction of a cellulose plant on the shore of the Uruguay River burst the pulp mills conflict in Gualeguaychú. The citizens of Gualeguaychú initiated a movement of protest that soon transcended the local dimension as it is regarded and studied under the notion of ecological citizenship (Melo, 2020).

[3] In Spanish: Plan de Alimentación Sana, Segura y Soberana. It began its implementation in 2018 but was institutionalised in 2021.

This paradox raises important questions about the visibility and legitimacy of urban food strategies beyond dominant governance frameworks as they fly under the radar with undiscovered and unshared learnings. Through the analysis of this initiative, the aim of this paper is to provide insight on how these types of policies work, what kind of challenges they face and how they align with international food policy frameworks, despite working "*behind their scenes*". Results from this study contribute to a deeper understanding of the role that Alternative Food Networks can play in food planning approaches in the Global South. Additionally, it enhances knowledge of urban food strategies rooted in this context, highlighting the challenges of developing innovative policies when certain key factors—such as the continuity of the government and multistakeholder partnerships—are not in place nor well established.

2. Theoretical Framework

The study of urban food strategies (UFS)—comprehensive approaches that cities adopt to address food-related challenges—has become an increasingly significant area of scholarship. As Hawkes and Halliday (2017) noted, an urban food policy involves concerted actions by city governments to tackle these food related challenges. Within urban food policies, two primary approaches can be identified: integrated strategies that address multiple aspects of the food system simultaneously, and single-issue policies that focus on specific, targeted actions (Bricas et al., 2017; Calori et al., 2017). Moragues et al. (2013) define UFS as a "process consisting of how a city envisions change in its food system through a holistic framework that considers both horizontal and vertical dimensions of governance" (p. 6)—the former referring to the integration of multiple policy domains and stakeholders, and the latter encompassing coordination across different levels of government and food system stages.

Ilieva (2017), despite pointing out that there is no single definition of UFS, agrees with Moragues et al. (2013) by pointing out that this kind of initiatives provide a "roadmap" for how to improve the local food system. The mentioned authors also agree that UFS can take many forms as they can be implemented in a top-down or a bottom-up manner (a flexibility of particular importance in our case study) as they are highly conditioned by their local context, but they do catalyse new synergies between local stakeholders. We find that this term, Urban Food Strategy, is the most suitable to adopt in this article given the importance it confers to locality, to the action of different stakeholders and social movements, and due to the broad perspective of initiatives it encompasses.

Research conducted on urban food strategies presents a robust corpus that provides practical guidance on designing urban food strategies (Moragues Faus et al., 2013), insight on food governance practices (López-García et al., 2020; Sonnino, 2016; Zerbian & De Luis Romero, 2023) and deep analysis regarding the monitoring and implementation frameworks, the ideological motivations, and the international food network integration of the UFS (Ilieva, 2017; López Cifuentes et al., 2021; Martín, 2019; Smaal et al., 2021). All in all, these works underscore the importance of urban food strategies as critical tools for addressing the complex challenges of urban food systems but also showcase the difficulties and barriers to implementing them.

We decided to analyse a specific UFS considering the insights provided by this international literature coupled with the policy cycle theory or sequential policy model, as the latter allows a deep understanding of how policies evolve over time. Policy cycle theory proves valuable from both descriptive and explanatory perspectives, even when some stages of the process remain incomplete or when the whole policy comes to a halt (Comba, 2006; Estévez, 2024; Jann & Wegrich, 2017; Nogueira, 1995).

Finally, given the relevant role that Alternative Food Networks (AFN) and Short Food Supply Chains (SFSC) play in urban food strategies and in our case study because of their promotion of healthier and environmentally friendly forms of production, we find it essential to rely on widely referenced studies in international and national literature (Caracciolo et al., 2012; Craviotti & Soleno Wilches, 2015; Goodman, 2003; Renting et al., 2003; Tarditti, 2012). We understand AFN as new organisational structures that carry the potential for political transformation but also as institutional models that promote an alternative rural development paradigm, which in our case refers to the agroecological transition. AFNs involve SFSCs that promote and strengthen physical, social and cultural proximity, by establishing trust bonds and shared values related to the specific attributes of the food. Furthermore, as we are interested in the logistical challenges that urban food strategies involve, we take into account those works that specifically consider these issues (Belletti & Marescotti, 2020; Cendón et al., 2023).

3. Methodology

This study is primarily based on a qualitative-exploratory analysis regarding the urban food strategy and food system of the city of Gualeguaychú, located in the province of Entre Ríos, Argentina. Research involved the systematisation of first-hand interviews conducted with local agents, the examination of national census data and official municipal documents, and the review of specialised literature (Fig. 1).

These methods and sources were employed to characterise the local food supply system and its agents, to explain the challenges of the alternative food landscape, and to examine Gualeguaychú's urban food strategy. The investigation covered the period between 2018–2024, from its beginning to the more recent situation of uncertainty regarding the continuity of the food plan.

Figure 1. Gualeguaychú´s location in Argentina.

Regarding primary sources, we conducted 54 semi-structured interviews with a diverse range of 'food agents' in Gualeguaychú, to ensure that nearly all perspectives within the local food system were captured, with a focus on the fresh food sector (fruits and vegetables) because of its geographical proximity and importance for a healthy nutrition. We interviewed managers of retail stores (three), supermarkets (three), local farmers (seventeen), alternative food traders (three) and consumers (fifteen), qualified informants belonging to national agencies of rural development (nine) and policy makers of different administrations (four). These interviews were conducted between May 2022 and November 2024 and were transcribed immediately after fieldwork. Subsequently, they were analysed using Atlas.ti software through an initial coding of key concepts such as urban food strategy, food logistics, agroecology, and local production (with additional codes being incorporated as the analysis progressed). What is more, we constructed a typology of the actors that sustain the conventional and alternative food supply system.

In relation to the urban food strategy investigated, the Healthy, Safe, and Sovereign Food Plan (HSSFP), we carried out: i) an examination of the phases of the local urban food strategy with a sequential policy model approach that includes the description and analysis of the following processes: agenda-setting, problem definition and policy formulation, implementation, evaluation, and interruption; ii) a detailed review of institutional documents of the HSSFP comparing its guidelines and objectives, as well as its measures, with the Milan Urban Food Policy Pact framework for action, considered as the most developed agreement of urban food policies up to now.

4. The Urban Food System and Supply of Gualeguaychú

Given Argentina's role as a major commodity exporter, Argentine food policies in the last fifty years have tended to focus more on concerns about food security, locally framed as the impact of food prices on the socio-economic conditions of society, rather than on adopting a comprehensive approach to food issues (Barsky, 2020; Borrás, 2013; Craviotti, 2022).

Food policies have manifested through assistance programs to the poor population complemented with the regulation of the prices of key food items through direct intervention or the appellation to the possibility of importing food, according to the orientation of national governments. In spite of a main focus on food security, food sovereignty was also considered in some conjunctures (Blasich, 2020). There have also been programs oriented to support family farming, but they did not address the structural limitations of the sector, so the trend towards land concentration has persisted over time.

Most of these programs have been designed by the national level; the legal framework limits the capacity of the urban governments to carry out development policies. Nonetheless, one big Argentinean city, Rosario, has been able surpass these limitations, develop a globally recognized urban food policy[4] that stands out as an example for the region and leads the way in terms of urban agroecology and innovative food policies that include food sovereignty at its core (Lattuca, 2011).

Within Argentina, Entre Ríos—the province where Gualeguaychú is located—exemplifies a territory that was rapidly integrated into the global agribusiness framework, becoming a key producer of export-oriented commodities such as soy, corn, wheat, and more recently, poultry. This area, situated in the eastern edge of the Pampas plains, has shifted from being a livestock-agricultural to an agricultural-livestock area

[4] Despite having developed actions since 1989, Rosario joined the MUFPP in 2020 and holds, together with Belo Horizonte, the representation of South America in the MUFPP Central Committee. Due to its continuity, it is a well-known experience in international fora and has been awarded by the MUFPP in 2022 in the food production category. For more information see Dubbeling et al. (2016) and Tornaghi and Dehaene (2020).

(Crojethovich et al., 2012). According to Gualeguaychú´s municipal Habitat Secretariat (2022), "*the main crop, nowadays, is soybean, followed by wheat and corn, all cultivated using the direct seeding technology package and the use of chemical inputs*."

In any case, this integration into international commodity chains, which is neither unique nor original to Entre Ríos but rather reflects Argentina's re-primarized accumulation model (Svampa, 2013), underscores the interruption of the state-planned projects of the mid-20th century that aimed to modify the province's agrarian structure, through the establishment of agricultural colonies that would supply its cities with local food.

While food planning was marginalised within state action, several phenomena at the end of the 20th century and the beginning of the 21st century accelerated the decline of pre-existent regional and local horticultural belts. The growing urbanisation, the expansion of grain production, land concentration and the rise of supermarkets -usually multinational enterprises- pushed Gualeguaychú into food dependence.

> *"These processes of industrial agriculture have made it so that a working producer, whose main capital is his labour force, on an 80-hectare field, prefers to rent it out. So, that producer who 30 years ago had chickens, had a considerable vegetable garden with pumpkins is no longer there... (In that time) that production was sold locally."* (Agricultural historian from Gualeguaychú, personal communication, August 2023)

> *"We had a cooperative here, a cold storage plant, we were surrounded by farms, and we [the people from Gualeguaychú] could consume our local production."* (Consumer at a local alternative food retail shop, personal communication, 2022)

Currently, the provincial fruit and vegetable sector shows a poorly developed reality that forces the region to source externally up to 80% of its total demand of vegetables, according to estimates from the 2007/8 provincial horticultural census. Both state agents and qualified informants of Gualeguaychú (farmers, vegetable vendors and consumers) agree on two key issues: i) that the vast majority of fruits and vegetables consumed, except leafy vegetables, are not locally produced, highlighting the importance of the wholesale markets of Buenos Aires, Rosario, and Córdoba, situated at least 200 km. away; and ii) that during the early 2000s, many local farmers abandoned their activities.

> *"My father-in-law, who has worked in this (horticultural production), for 30–40 years, will tell you. There used to be more people producing and there was more local production."* (Farmer of Plaza Belgrano Farmers Market, personal communication, August 2023)

In this context, most of Gualeguaychú's fruit and vegetable supply is managed by various agents who employ different logistical and commercial strategies to ensure food provision. These agents can be classified based on whether they engage (or not) in wholesale redistribution, along with secondary criteria such as their logistics of supply, scale of operation, capital resources, and their sourcing of locally produced vegetables. Despite their diversity, the most significant actors are multinational supermarkets that rely on extra-regional distribution centres and local greengrocers, who control their own logistics, transportation and networks, and thus operate as wholesale distributors within the city.

The fact that these agents are almost entirely supplied with fruits and vegetables from external sources (being leafy vegetables the exception) and of conventional food systems of production that rely heavily on agrochemicals, exposes how Gualeguaychú is being fed. These features partly explain why the urban food strategy initiated in Gualeguaychú aims to achieve a sociocultural shift towards food quality—understood as a polysemic category that encompasses aspects such as nutrition, cultural rootedness, and locality— and to enhance local production, along with a strong emphasis on food safety and health.

5. Gualeguaychú´s Urban Food Strategy

Gualeguaychú´s urban food strategy: the Healthy, Safe, and Sovereign Food Plan (HSSFP), inadvertently began its journey by 2015 with an isolated practice of local food procurement of a short number of public facilities. By 2018 it consciously took a step forward with a highly contested normative disruption, an ordinance that placed a ban on the use of glyphosate. This action framed in health concerns, paved the way for a more comprehensive and constructive approach that regarded its local food system as an integral field of action and transformation that would include health at its core but would focus on food.

This integral approach, the food plan, was based on specific ideological flags — food sovereignty and agroecological production- that reflected the viewpoint of those who participated in the formulation process. With a somewhat clear roadmap that lacked quantitative data but demonstrated a statement of intent -to achieve an agroecological food system transition-, Gualeguaychú´s urban food strategy was officially established by 2021. In order to understand how and why this UFS was designed, how it was implemented, and with which actors, in the next paragraphs we follow the sequential policy model approach to further develop our critical examination of the policy.

A. How did "food" become a public policy in Gualeguaychú?

The local administration that would establish the HSSFP, reached the municipal government by 2015. These authorities were particularly bound to work on health issues as some of them, the mayor for instance, were healthcare

professionals themselves. This is why the incoming government platform included the project of establishing a local vegetable production, free of agrochemicals, to guarantee the local procurement of public facilities, specifically those for early childhood. However, the development of a comprehensive urban food strategy aligned with the idea of food sovereignty was not yet part of the agenda.

The Municipal Food Production Centre[5] was established by September of 2017 in 6 hectares that were obtained on a loan by the municipality. It´s management was commended to a cooperative organisation. Official data reveals that during its first 8 months, the project produced approximately 25 thousand kilos of vegetables such as: chard, parsley, squash, green onion, cucumber, beet, celery, cabbage, and melon.

This experience resembled more of a single-issue policy that focused on a targeted action than an integrated food strategy. However, this approach was bound to an early shift as the growing national, regional and local concern regarding illnesses (cancer being the most notable) connected to the excessive use of agrochemicals (glyphosate) in areas devoted to grain production sparked a nationwide dispute over the safety and sustainability of Argentinian food systems (Blois, 2017; Carrasco et al., 2012).

This national concern over agrochemicals was reflected in the emergence of a national movement that included the networking of social movements, academic researchers and professional associations of which the "Network of Fumigated Towns" was the most recognized (Berger, 2020). As their collective and grassroots actions sparked numerous municipal interventions in the Pampas region, which usually limited the range of use of agrochemicals (particularly glyphosate) within cities' limits, and Gualeguaychú´s society also had health concerns of its own, the situation nudged local authorities to push on this agenda.

The growing number of cancer diseases among local society and the infamous case of a child intoxicated by agrochemicals not only led to the conformation of a local organisation called "Stop Cancer", that orchestrated numerous mobilisations but also drove the local authorities to finance an epidemiological study of cancer.[6] The study found that, overall, the behaviour over time of cancer mortality rates in Gualeguaychú showed a relatively increased risk in the city but there was no relevant annual difference (between the city and what national statistics showed) in the total number of diagnosed cases.

Simultaneously, the local authorities strived to discover the elements that were causing cancer. According to the Health Office Director of the time, they found that the main reasons were issues related to food, water (its components), and, ultimately, the underlying production model that required lots of external inputs to function. What is more, they realised that Gualeguaychú lacked specific legislation for its predominantly rural areas (30,225 hectares of 33,000), despite them being most of the territory.

So, those internal reports and the results of the epidemiologic investigation, plus the society support, legitimised the decision to promote legislation- the same day the results of the report were publicly presented- to regulate and prohibit the existence of glyphosate in the city: the Ordinance Nª 12.216/2018. At this point, as the focus of the issue was shifting towards the characteristics of the local food system, local authorities began to consider the option of formulating a comprehensive urban food policy. To do so, the ecologist[7] blueprint of the local authorities led them to convene various food-related experts from other areas of the country closely linked to the food sovereignty movement to develop and steer an action plan.

With this joint vision, that did not include every local food stakeholder nor relied on a detailed background and baseline research, the Healthy, Safe, and Sovereign Food Plan (HSSFP) began to be conceived and designed.

> *"It's useless to change the entire production model—stop spraying poison on the population, care for the air, the soil, and the people—if you're still eating poorly. If food doesn't become the essence of life, the effort is wasted. Eating junk and unhealthy food doesn't just lead to hunger and malnutrition; even children from wealthy families suffer from poor nutrition. In other words, focusing on only one aspect isn't enough. You could change a community's diet—if that were possible based solely on intentions—but if the surrounding environment remains contaminated with substances like chlorinated compounds or other harmful chemicals, the impact will be limited."* (HSSFP coordinator, personal communication, August 2023)

So, this process of agenda setting demanded a thorough political action. As we have seen, the first intervention involved the ban of glyphosate and established itself as the first legislative precedent (in 2018) of the future urban food strategy that would not be enacted until April 2021. However, during that period, several other local legislations related to food issues were passed: the declaration of municipal interest in family agriculture (2020), the municipal adherence to Sustainable Development Goals (2020) and the incorporation to the National Network of Municipalities and Communities that promote agroecology (RENAMA) in 2021, being the most notorious.

[5] In Spanish: *Centro de Producción de Alimentos Municipal.*

[6] The study evaluated cancer incidence between 2000 and 2011 and mortality between 2000 and 2015.

[7] Dating from the international pulp mill conflict that developed in Gualeguaychú in the mid-2000s (Merlinsky, 2008).

Table 1. Alignment between food sovereignty principles and the healthy, safe, and sovereign food plan (HSSFP)

Food Sovereignty principles from La Via Campesina (1996)	HSSFP measures
Agrarian reform	Create an agroecological colony by loaning municipal owned land to a farmer´s organization
Protecting natural resources	Ban glyphosate, promote agroecology, create a bio-factory
Reorganizing the food trade	Promote short food supply chains and build a Municipal Market
Democratic control	Establish a multi stakeholder food policy council and specific sectoral boards

Source: Own elaboration based on official documentation of the HSFPP.

These municipal ordinances laid the institutional and political groundwork for the comprehensive agro-food policy that was taking shape. They also hinted at an emerging human rights-based approach that would become the cornerstone of the plan, which was complemented by a strong emphasis on food sovereignty.

B. The Healthy, Safe, and Sovereign Food Plan: A holistic strategy

The HSSFP was institutionalised through a municipal legislation that included a series of official comprehensive strategic documents through which the general framework of the program and its formulation was communicated. The strategic document contained: the rationale, objectives, target audience, scope, and lines of action. The rationale was supported by two central principles: i) that food was a human right and that the State—in all its levels—had the obligation to guarantee accessibility; ii) that the primary food production system was in crisis and required an intervention to enable a transition to agroecological production processes that promote human well-being and environmental conservation.

Reading those documents, the HSSFP, already from its name and its strong emphasis on food as a basic human right, aligned itself with the ideals of food sovereignty. The fact that many of its measures line up with the food sovereignty principles from La Via Campesina (1996), as shown in Table 1, evidence this viewpoint. The plan appealed to ideals of food justice that include the democratic participation of all stakeholders and the conservation and restoration of ecological systems.

To achieve these purposes and follow those principles, the objectives of the UFS were grouped into four thematic fields: a) Production, processing, and commercialisation; b) Environmental awareness and responsible consumption; c) Training and knowledge; d) Communication. These thematic fields were integrated by sub-items such as: a.i) Promotion of the local production of pesticide-free foods; b.i) Generation of responsible consumption habits and healthy eating throughout the local population; c.i) Research projects on the local production system, readiness for transition, interests, and demands of the sector; d.i) Creation of an observatory of production and healthy eating with local, provincial, and national experiences and a food policy council.

Programmatically, to organise the achievement of the proposed objectives, the plan was structured through five lines of action: i) Research; ii) Training; iii) Advisory and production; iv) Communication; v) Articulations and alliances.

These lines of action represent the paths for the implementation of the policy. They fulfil the same ordering function as the strategic action framework of the MUFPP by guiding the implementation process. Regarding the target audience and scope of the policy, they aim to operate over the whole department of Gualeguaychú and remain consistent with the notion of sustaining a public policy aligned with the Sustainable Local Development goals.

C. How was the HSSFP implemented?

The implementation is considered the materialisation phase of the policy and, therefore, the essence of any public policy. While this phase constitutes the effective execution of tasks it also includes monitoring and evaluation work and may also include the actions prior to the sanction of the plan, such as the "glyphosate ban", because they specify policy goals and provide political support. What is more, the responsibilities to oversee and develop the policy should be established during this phase.

The enactment of the HSSFP explicitly stated in Article 3 that the Secretary of Social Development, Environment and Health was entrusted with executing the policy. However, it was also stated in Article 4 that the HSSFP must be transversal to all areas. This approach was meant to enhance "Horizontal city-level governance" (one of the urban food policies enabling factors according to Hawkes and Halliday, 2017) and to include several departments engaged with and committed to the policy.

> *"The HSSFP is transversal (horizontal) to all departments. The HSSFP is integrated by the departments of production, environment, bromatology, veterinary medicine, social development, health, and social economy."* (Bromatology Department Member, personal communication, August 2023)

Table 2. Food matrix

Type of production	Origin of production		
	Gualeguaychú	Regional	National
Agroecological	Local labour+healthy food	Regional labour+healthy food	Healthy food
In transition to agroecological	Local labour	Regional labour	
Agroindustrial	Local labour	Regional labour	

Source: Own elaboration based on official documentation of the HSSFP. HSSFP: Healthy, safe, and sovereign food plan.

Despite the virtue of this approach, its execution proved to be too horizontal to actually strengthen the implementation of practices, as there was no specific governance body structure of the HSSFP to ensure accountability, nor did external stakeholders (outside the municipality) have clarity about the main institutional actors of the policy. That is why eventually the policy found its institutional place at the Environmental department.

> *"At first, the HSSFP was very transversal to the municipal government due to the complexity of the program. In other words, we (nutritionists, food scientists, administrators, etc.) understood that we were all contributing to making healthy, safe and sovereign food. The perspective was to understand life from another place, to "imitate" how the "monte" (forest) works. That (transversality-horizontal governance) was a virtue, without a doubt, but we (local governments and authorities) are not prepared to work with that scheme. Then, a year or two later, it (the HSSFP) had to be anchored."* (HSSFP coordinator, personal communication, August 2023)

After addressing the governance of the policy, the plan's roadmap required budgeting and further clarification. Regarding funding, the plan received a national endowment for nearly 200.000 dollars and obtained 185.000 dollars via the municipal budget in 2022. Regarding clarification, conceptual tools like "scenario construction" are often employed during implementation to guide actions, and in Gualeguaychú, this framework was effectively applied. Using a rapid assessment, the municipality's technical teams developed a food matrix (Table 2) that mapped the geographical origin of food consumed in Gualeguaychú. This matrix served as the foundation for defining the "base scenario" of the local food system and envisioning a "desired scenario" to guide the UFS efforts.

The trajectory from the "*Supply and consumption of national and agro-industrial food production*" (considered the "baseline" scenario, as informal official data suggests that only 5%–8% of food was produced locally), to the "*Supply and consumption of local and agroecological food production*" situation (considered to be the "desired" scenario) was meant to include the passage through intermediate stages of regional food production (hence, moving from the right bottom quadrant in red to the upper left quadrant in green) that were also considered an improvement of the initial scenario.

Moreover, that progression, and every other practice within the food plan for that matter, also took into account the estimation of how much food the department required to be fed. For that purpose, according to the dietary official guidelines for the Argentine population, Gualeguaychú needed per month: 1,200,000 litres of milk and yogurt, 72,000 kg of fresh cheese, 100,000 dozen of eggs, 312,000 tons of meat, 960,000 kg of vegetables, 720,000 kg of fruit, 72,000 kg of oil, seed and dried fruits, and 4,800,000 litres of safe water.

Even though the food demand estimates were more a declaration of intent than an actual achievable goal, every practice and measure carried out had in its core the idea of shortening the distance between the baseline and the desired scenario. Therefore, the main practices of the UFS were aimed at increasing the volume of local produce and strengthening commercialisation (and healthy consumption) through short food supply chains. Within the first realm, the creation of an agroecological colony was the key initiative (arguably the most important project of the policy), alongside a Participatory Local Agroecological Guarantee System that could not be established. The opening of a Municipal Market represented the main effort in terms of food supply and distribution.

Regarding the agroecological colony, its construction began with the decision (disputed by environmentalist groups and political opposition) of developing agroecological production sites in a municipal-owned natural reserve called "Las Piedras", that was previously loaned to private users.[8] The local authorities decided to reorganise the use of these 300 hectares and destinate 60 to agroecological production (and let the rest for conservation purposes) complemented by the instalment of a biofactory to supply organic inputs to the producers of the colony and other areas of Gualeguaychú. This biofactory produced up to eight thousand liters of bioles[9] annually since 2020.

[8] Who developed a racetrack venture and established an agrarian school.

[9] Liquid fertilizers made from whey and bovine manure, essential inputs to ensure agricultural production without agrochemicals.

> *"The challenge of conserving and producing, and producing while conserving, was an interesting objective."* (HSSFP coordinator, personal communication, August 2023)

To do so, the municipality signed a management agreement in 2021 with a farmer organisation, the "Union of Land Workers (ULW-UTT),[10] notable for its agroecological and food sovereignty viewpoints that vindicate a national land reform (Acero Lagomarsino, 2022; Sotiru, 2021). The ULW-UTT was "loaned" with 15 hectares of land to be worked by 10 farmer families belonging to the organisation. The referred agreement also included the municipal commitment to build houses for these families (on additional land inside the conservation area). ULW-UTT farmers assumed the compromise of delivering 20% of its produce to public facilities. However, as the main members of the organization are farmers of the Buenos Aires horticultural belt, this meant that the members of the colony would not belong to Gualeguaychú. This would later prove to be a problem as local stakeholders felt undervalued within the UFS.

Despite the colony's primary focus on horticultural production, it was sought to include egg, fruit, and honey production, along with regenerative livestock. While the project initially benefited from national and municipal funding, as well as political support, after two years of operation it only managed to cultivate three hectares of horticulture (with the labour of two farmers that established themselves in "Las Piedras" during 2020) and to hold, discontinuously, a mobile chicken coop for 200 chickens. Despite the lack of houses (they were never constructed) being a big factor of these shortcomings, other issues also took their toll.

> *"It's a combination of things: working with the municipality is slow; in Gualeguaychú, summers are extremely hot, and lettuce gets scorched, while in winter, it's very cold, so lettuce, chard, and beets also suffer from frost damage; accessibility to Las Piedras is impossible when it rains; most farmers want to have dogs, but here, it's not feasible; waste management is another issue—there's a habit of separating waste here. So, starting a farm from scratch in a new province is quite a big challenge."* (ULW Farmer in Gualeguaychú, personal communication, June 2022)

Furthermore, the ULW, the managing organization, faced challenges to allocate sufficient resources and attention to the colony, as it was engaged in multiple advocacy efforts at national, regional, and local levels due to its rise in public and political exposure amid high-level national political commitment during the period of 2019–2023. Nevertheless, compounding these issues, a political shift in 2024 led to reduced backing from authorities, halting progress during a contentious election year.

This process reveals the coexistence of two contrasting policy implementation perspectives. On one hand, it can be seen as a bottom-up initiative, given its alliance with a national stakeholder that represented and advocated for the demands of small agroecological farmers: the ULW-UTT. On the other hand, local stakeholders perceived it as a top-down, vertical practice, feeling excluded from the process and viewing the new, "foreign" actor, as disproportionately prioritized, although support to local horticultural farmers was also given, and a cooperative of local producers was also created with the help of the local government.

Lastly, the HSFPP also promoted community gardens through advice and training workshops, assistance with tools and biological inputs, and seed and seedlings distribution alongside the National Institute of Agricultural Technology. At some point during 2020 there were up to 500 vegetable gardens functioning in the city according to the authorities interviewed.

> *"We work with different types of gardens because there are institutional gardens—such as those in health centres or schools—that serve an educational or social support purpose; family gardens; and collective-process gardens, such as community-popular gardens. Or even the biopark [Colonia Las Piedras], which works similarly to Rosario´s community gardens."* (Member of the Social Economy department, virtual interview, November 2022)

When it comes to food supply and distribution, two main practices were implemented: the establishment of the "Nutrir Program", and the promotion of alternative short food supply chains of which the creation of the Municipal Market was the main accomplishment.

The *Nutrir Program* (now called *IgualAR* under the new administration) is a state-funded initiative that began in 2021. The municipality provided a registered credit card, loaded with either 25,000 or 60,000 Argentine pesos,[11] to 2,150 low-income families in 2023 to enhance food security. Eventually, the Nutrir team managed to incorporate the Municipal Market into the stores that could accept the Nutrir card, nudging the recipients towards the adoption of more sustainable diets. But they could not convince farmer´s market members to get a bank account and be able to accept the card instead of cash.

Regarding the enhancement of short food supply chains, its goal was to facilitate the commercialisation of local production directly from its producers; hence benefiting local farmers and guaranteeing the physical and economic access of agroecological food to local society. The HSFPP input was to guide on bromatological and productive issues, and counsel on the procurement of funding, apart from guaranteeing a public space for the farmers markets and providing sponsorship and publicity.

[10] In Spanish: *Unión de Trabajadores de la Tierra*.

[11] Approximately 86 and 205 US dollars monthly considering the official exchange rate annual average.

As a matter of fact, the establishment of short food chains has been notable in the city. A new farmer market that involved the participation and strengthened the work of three new agroecological farmers[12] was set up in 2021 (the Belgrano Square Agroecological Farmers Market) and a food cooperative that holds an agroecological and social economy approach was formalised in 2021 (Demicheli & Craviotti, 2023). Additionally, the Municipal Market was launched at the end of the same year. These three new agroecological experiences added up to the pre-existing Green Farmers Market -whose three farmers[13] began an agroecological transition under the HSFPP and together multiplied the availability of spaces for purchasing healthy and mainly locally produced food.

These AFN show diversity from the organisational point of view (direct marketing from the producers, initiatives managed by solidarity intermediaries and a state-managed producer-to-consumer market) and regarding the qualities of food they sell. Food may be organic, such as the "yerba mate" offered by Ñande cooperative; agroecological, like the vegetables at Belgrano Square and the fruits at the Municipal Market; transitioning to agroecological, as the vegetables at the Green Farmers Market; or conventionally produced by a cooperative, like the rice and pasta sold at the Municipal Market.[14] But, aside from seasonal vegetables, most of these products are predominantly sourced from non-local producers, accessed through urban agroecological operators located in Buenos Aires wholesale market. These nonlocal agents guarantee a continuous supply throughout the year of certain types of agroecological, organic, and/or cooperative food. Thus, coordination with these actors allows the local AFN to expand their food offering to consumers and specialized wholesalers stand out as critical agents from the logistical point of view (Craviotti & Demicheli, 2023).

Finally, in other areas of the food strategy, although the HSSFP envisaged actions related to research, communication, food waste and organising stakeholder participation- results have been somewhat limited. When it comes to research and communication, two scientific congresses on food, agroecology, and food sovereignty were held to share the achievements and raise awareness. Regarding food waste, the "EcoPark", a waste separation plant founded in 2014, managed to process approximately five tons of food waste per week at its peak. Finally, regarding the "horizontal" city level governance, while there have been efforts to establish sectoral stakeholder boards to swiftly introduce the idea of forming a food policy council, these initiatives did not materialise into a consolidated entity. As a result, the UFS reflected more of a top-down approach with little horizontal governance or participatory multi stakeholder processes, a key aspect to develop rootedness in the local society.

D. The interruption of the UFS

In the case of the HSSFP, an institutionalised evaluation -that should allow the understanding and analysis of the impacts and results of the policy-, whether qualitative, quantitative, or mixed, has not been developed and no indicators have been constructed. Similarly, the UFS has not reached an official reformulation phase, even though many practices were transformed and adjusted permanently. The primary explanation for these shortcomings lies in financial constraints, inadequate participatory policy processes, scarce data collection, political timing, insufficient institutional capacities and, most notably, the change in municipal leadership following the 2023 elections.

In fact, the administration that implemented the HSSFP failed to secure re-election, and an ideologically opposed party assumed power, choosing not to continue the policy. As a result, many initiatives that were incorporated into the food plan documents were left incomplete or never initiated at all.

Why did the HSSFP come to a halt? There are several reasons that explain this decision: i) there was a change in the political atmosphere at the national, provincial and municipal sphere, implying a shift towards neoliberal-conservative approaches. New authorities do not "believe" in agroecology as a valid, comprehensive food system approach, nor do they think the current food system is in crisis; ii) the new government has stronger ties to agribusiness stakeholders, as evidenced by their sponsorship of the revocation of the glyphosate ban in October 2024; iii) the HSSFP did not have enough support from local society nor productive stakeholders; iv) the agroecological colony did not show sufficient progress, and v) the Municipal Market was unable to establish itself as a regular destination for neighbours to purchase food (it was located too far away from the city centre) even though eventually, it established a program called "The Market in your neighbourhood" to tackle the challenge of making agroecological food accessible for the low-income families.

6. A Hidden Urban Food Strategy?

Now we can answer one of the main questions we asked in the Introduction. How did this Argentinian UFS relate to an international city food network such as the Milan Urban Food Policy Pact? Argentinian cities, with the notable exception of Rosario, have not been too interested in being part of the new international food agenda nor in constructing Latin American city food networks. Despite this fact, the MUFPP appears to be the main stage of participation as nine (9) Argentinian cit-

[12] Each of these farmers produce on one hectare of land.

[13] Each of these farmers produce on two hectares of land (Demicheli & Craviotti, 2023; Pérez, 2020).

[14] These categories are not mutually exclusive—food can be both agroecological and cooperative, highlighting the intersection of sustainable practices and collective efforts.

Table 3. Actions of the HSSFP in terms of the MUFPP framework

HSSFP framework for action	Actions - HSSFP	N° actions of the MUFPP
Production, added value, and commercialisation	Promote local production of pesticide-free foods.	20° - Promote and strengthen urban and periurban food production based on sustainable approaches.
	Strengthen and add value to the primary production of healthy foods.	24° - Help provide services to food producers.
	Encourage the development and economic viability of short food supply chains that allow safe access to healthy foods.	25° - Support short food chains. 32° - Expand support for infrastructure related to food market systems.
	Contribute to the understanding of climate change, its causes and consequences, and the mitigation and adaptation measures of the production practices.	34° - Convene food system actors to assess and monitor food loss and waste. 35° - Raise awareness of food loss and waste.
Environmental community and responsible consumption	Create responsible consumption and healthy eating habits among the entire local population.	7° - Promote sustainable diets and nutrition.
	Empower organisations and social groups in Gualeguaychú committed to environmental care and sustainable development.	2° - Enhance stakeholder participation.
	Influence the food supply and diets habits of public schools that have cafeterias.	30° - Review public procurement. 15° - Reorientate school feeding programmes.
Training and knowledge generation	Study of risk perception and vulnerability of different social sectors of the Gualeguaychú population.	8° -Address diseases associated with poor diets and obesity.
Communication	Create an observatory of "health and nutritive production" with local, provincial, and national agents.	5° -Develop multisectoral information systems.
	Generate networks of responsible producers and consumers.	18° - Promote networks and grassroots activities.
	Offer training and peer to peer exchange opportunities on addressing environmental issues in the media.	19° - Promote education, training and research.

HSSFP: Healthy, safe, and sovereign food plan; MUFPP: Milan urban food policy pact.

ies have signed it,[15] even though, for the most part - if not entirely - they exhibit specific practices (working on one or two categories of the framework for action) or do not have a practice at all (almost 50% do not have a practice).[16]

However, we have argued that this is not the whole reality as Gualeguaychú had an urban food strategy although the city did not sign any international agreements, meaning it operated behind the scenes of the international city food network. So, given that the MUFPP is the most influential city food network in Argentina and probably of the world, how can we situate the HSSFP's strategy, compared to the MUFPP's framework for action? Could a significant difference between the two approaches be the reason why Gualeguaychú opted not to sign the pact or join any other international food network?

The results presented in Table 3 show that the framework for action of the HSSFP and the MUFPP were actually aligned. As previously stated, Gualeguaychú´s UFS presented (although not always completely addressed) actions that relate to all the practice categories (6) the MUFPP proposes as framework for action: Governance, Sustainable diets and Nutrition, Social and Economic Equity, Food Production, Food Supply and Distribution and Food Waste. We can identify various measures the HSSFP implemented that aligned with the MUFPP actions:

- HSSFP creation of an agrarian colony - agricultural park- sustains MUFPP action N° 23 "*Protect and enable secure access and tenure to land for sustainable production in urban and peri urban areas*" (Food production).

[15] Tandil- Esteban Echeverría - San Antonio de Areco - Ciudad Autónoma de Buenos Aires - Rosario - Santa Fe - Córdoba - Godoy Cruz - Río Grande.

[16] According to the MUFPP official website, the following signatory cities do not present any practice at all: Tandil, Esteban Echeverria, Santa Fe and Godoy Cruz.

- HSSFP construction of a biofactory to supply organic inputs to producers may be included within MUFPP action N° 24 "*Help provide services to food producers*" (Food production).
- The fact that HSSFP was envisioned as transversal to all management and institutionalised via municipal legislation, relates to MUFPP action N° 1 "*Facilitate collaboration across city agents and departments*" (Governance).
- HSSFP "Nutrir program" (a registered credit card containing state funds to spend on food) to support food security and nudge consumption towards healthy choices is essentially, MUFPP action N° 14 "*Use cash and food transfers*" (Social and economic equity).

Then, what could have been the reasons for opting to not engage with the MUFPP or any other city food network? According to the local authorities interviewed -coordinators and members of the HSSFP- there were at least three (3) reasons that explain this:

I. There was a strong desire to build on local methodologies with local and national experts, creating distance from external influences to foster independence and sovereignty.
II. Reflecting on external experiences from other cities was not part of the formulation process, even though the individuals that participated in them may have had references about some of them. Consequently, worldwide urban food strategies experiences were mostly unknown or at least not clearly incorporated into the strategy.
III. There was a sense of alert or aversion to joining supranational institutional frameworks as those highly institutionalised arenas were viewed as instruments for the "maintenance of the status quo". They were understood as strengthened by organisations that do not belong to the Global South which, to accept participation may require to compromise or to agree on certain issues that local authorities may be resistant to accept.

So, joining a highly institutionalized network, such as the one sponsored by the FAO, was not even considered an option. Their decision was not a rejection of the MUFPP itself but rather a refusal to engage with the international urban food policy arena. Instead, they chose to remain "hidden."

As stated before, the reasons they remained "behind the scenes" of international city food networks and urban food policy arenas were primarily ideological, rather than pragmatic or operational. HSSFP's commitment to principles of social justice, agroecology, and food sovereignty may be seen as values that serve as banners of resistance and alternatives strongly tied to social movements from the Global South. These principles are less integrated into the urban food strategies of the Global North (Smaal et al., 2021). This ideological positioning helps to explain the reluctance of key local actors to engage with institutions perceived as colonialist organizations of the Global North, reflecting a conscious effort to prevent institutional co-optation (Altieri & Nicholls, 2012; Giraldo & Rosset, 2016; Laforge et al., 2017). This perspective suggests that the Global South may serve as a more likely host for these "hidden" UFS—a line of inquiry that warrants further exploration.

Then, should the South build its own city food networks or overcome differences and join these global structures? Which would be the pros and cons of both alternatives? Whatever the answer might be, as recent as 2024, a new network called "Intermediate cities and food systems network",[17] has been leading the way in the South. However, as this new network holds sponsorship from supranational institutions like FAO, concerns about external influence and control may persist.

Lastly, while we can only speculate whether signing the MUFPP or joining any city food network would have ensured a better implementation of the food strategy, the acquisition of additional funds, or, most importantly, the continuity of the policy—a key factor for the success of food policies, often defined as "political commitment that transcends electoral cycles" and "participatory policy process" (Hawkes & Halliday, 2017)—integrating this kind of networks could have been beneficial, at least, for strengthening the evaluation phase. This could have been achieved by adapting the MUFPP's indicators to align with local characteristics. Ultimately, a crucial question arises: does joining a city food network truly guarantee the continuity of urban food systems?

7. Conclusion

Having begun the paper by showcasing—and perhaps aiming to highlight—southern urban food strategies in intermediate cities that rely on the functioning of alternative food networks, we found that in Gualeguaychú there is still a predominance of a strongly consolidated, conventional food system that does not necessarily value food as the *grand social connector* we believe it to be.

At first glance, recognizing the hegemony (in terms of capitalization, impact, scale, and presence) of conventional circuits might be disappointing for the *sitopic* reader. However, this analysis has also allowed us to acknowledge the existence of alternative, agroecological marketing experiences that increasingly incorporate the participation of traditional and emerging local horticultural producers, who despite the interruption of the UFS continue to operate. The strengthening of these actors in a context mediated by the precedent, almost unique in our country, of an urban food strategy grounded in a human rights and food sovereignty perspective needs to be recognized and valued.

[17] In Spanish: *Red de Ciudades Intermedias y Sistemas Alimentarios*.

Gualeguaychú´s HSSFP aimed "*towards the progressive realisation of local food sovereignty*" through the implementation of a five-dimension framework for action and outlined a series of practices that encompass all the lines of action proposed by the Milan Urban Food Policy Pact (MUFPP). As it also introduces the urban environment as the primary territory of intervention, we may conclude that the HSSFP qualifies as an Urban Food Strategy that effectively aligns with many of the objectives set by the MUFPP.

Nonetheless, this alignment did not translate into networking with the MUFPP or with any other city food network. As this decision appears to be intentional -due to ideological reasons-, we qualify it as a "hidden urban food strategy". In a first stance we wondered whether this political and symbolic decision was worth it or if ideology outweighed the practical benefits of joining a global alliance that guarantees international legitimacy to certain local processes and could potentially ensure the continuity of a project, making it more resistant to municipal electoral cycles. Now, recognizing the interruption of the policy, that question remains unanswered and more relevant than ever.

In this sense, even though we cannot guarantee that being part of a food network is a sufficient condition to ensure the continuation of UFS, we do think that promoting a better and true involvement of local actors in the design and implementation—allowing them to have a voice and negotiate with external stakeholders—helps to sustain a policy. Having monitoring indicators also contributes by enabling the systematization of results and making them visible for the community and for the incoming authorities.

When it comes to its implementation, the HSSFP was analysed in line with the "*public policy cycle*" theory, though it did not complete all the phases. The proponents of the HSSFP clearly identified a problem to be addressed: the existence of a food production model in crisis, and they consciously incorporated it into their political platform. From that point onwards, they simultaneously advanced in the formulation, enactment and implementation of the policy despite the numerous challenges (not always surpassed) presented: the establishment of a multistakeholder policy process to improve food democracy, the elaboration of adequate monitoring mechanisms, the collection of data to make the right technical decisions, and finally the ability to surpass political discrepancies.

Despite its drawbacks, many implementation measures have been successful and stand out as significant policy achievements. These include the growth in the number of local agroecological farmers -although still low-, the establishment of some alternative marketing spaces where local producers can sell at fair prices, the improvement of consumer access to local and agroecological food, and the creation of an agroecological colony -agricultural park- (now dismantled). Additionally, while the institutionalization of the UFS and food-related legislation made the policy legally binding and was a significant milestone, it ultimately proved to be insufficient.

Regarding the AFN in Gualeguaychú, even though its supply depends partly on food produced in other regions and despite the lack of quantitative data to fully understand the impact of such alternative food experiences and their potential to scale up agroecology in all its dimensions, the presence of different short and alternative food supply chains remains significant because, as Glanz et al. (2005) observed, *"the availability of spaces for purchasing 'healthy/local' food defines a food environment, which in turn affects eating habits"*—a critical element in building a more liveable, just, and healthy reality.

All in all, weighing the contributions and limitations of the HSSFP, the promise of building a fairer, healthier, and more sovereign food reality remains within reach through urban food policies—provided they maintain continuity over time. This potential persists even when these policies develop outside international frameworks and take shape in the Global South. However, continuity and impact are not guaranteed by institutionalization alone. The experience of Gualeguaychú underscores that meaningful, long-term transformation depends on deep local engagement, adaptive governance, and mechanisms that ensure resilience beyond political cycles. If urban food strategies are to be truly transformative, they must not only secure legal recognition but also cultivate strong social foundations that empower local actors to sustain and expand their efforts. The engaged actors in cities like Gualeguaychú exemplify this possibility, demonstrating that even in challenging contexts, alternative food networks and agroecological movements can endure and inspire broader systemic change.

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Planlama 2025;Supp(1):89–105 | doi: 10.14744/planlama.2025.79745

ARTICLE / ARAŞTIRMA

Promoting Innovativeness, Sustainability, and Place-sensitivity: The Role of Governance in Urban and Peri-urban Agriculture

Yenilikçiliği, Sürdürülebilirliği ve Yer Duyarlılığını Teşvik Etmek: Kentsel ve Kent Çevresi Tarımında Yönetişimin Rolü

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ABSTRACT

Urban and peri-urban agriculture (UPA) impacts a wide range of social, economic and environmental aspects of urban development. This reflects the diversity of actors who participate in UPA governance processes and the intricacy of the UPA governance mechanisms themselves – both within individual UPA practices and in the process of city planning that regulates, supports and implements UPA initiatives. While the literature is rich in describing various UPA governance models, there is little research done on specific governance mechanisms that lead to concrete positive outcomes for UPA initiatives themselves, for urban dwellers and for rural-urban relations. In this article we aim to find out if there are distinct UPA governance mechanisms that have positive impacts on the sustainability of UPA practices themselves, on their innovative potential and on their capacity to solve concrete local social, economic or environmental challenges. Based on empirical data from 15 case studies from Europe and beyond, the article presents an in-depth analysis of UPA governance practices and mechanisms, implemented by various combinations of actors at three distinct stages of the development of UPA initiatives: their initiation, their implementation and their long-term maintenance. Based on a comparative analysis of top-down, bottom-up and hybrid governance approaches at these three stages, the article provides a comprehensive list of good practices and take-away lessons that could be equally valuable to practitioners, urban planners, policy-makers, supporting organizations and researchers in their attempt to enhance the conditions for UPA success and reduce the barriers it faces in any urban locality.

Keywords: Innovativeness; governance mechanisms; place-sensitivity; sustainability; urban and peri-urban agriculture.

ÖZ

Kentsel ve kent çevresi tarımı (İngilizce: UPA - Urban and peri-urban agriculture), kentsel gelişimin çok çeşitli sosyal, ekonomik ve çevresel yönlerini etkiler. Bu, UPA yönetim süreçlerine katılan etkenlerin çeşitliliğini ve UPA yönetim mekanizmalarının karmaşıklığını yansıtır: Hem bireysel UPA uygulamaları içinde, hem de UPA girişimlerini düzenleyen, destekleyen ve uygulayan şehir planlama sürecinde. Çeşitli UPA yönetim modellerini tanımlayan çok sayıda bilimsel kaynak söz konusu, ama UPA girişimlerinin kendileri, kent sakinleri ve kırsal-kentsel ilişkiler için somut olumlu sonuçlara yol açan belirli yönetim mekanizmaları hakkında çok az araştırma yapılmıştır. Bu makalede, UPA uygulamalarının sürdürülebilirliği, yenilikçi potansiyelleri ve somut yerel sosyal, ekonomik veya çevresel zorlukları çözme kapasiteleri üzerinde olumlu etkileri olan farklı UPA yönetim mekanizmalarının olup olmadığını bulmayı amaçlıyoruz. Avrupa ve ötesinden 15 vaka çalışmasından elde edilen deneye dayalı verilere dayanan bu makale, UPA girişimlerinin gelişiminin üç farklı aşamasında çeşitli etken kombinasyonları tarafından uygulanan UPA yönetim uygulamaları ve mekanizmalarının derinlemesine bir analizini sunmaktadır: Onların devreye sokulması, uygulanması ve uzun vadeli bakımları. Bu üç aşamada, yukarıdan aşağıya, aşağıdan yukarıya ve karma yönetişim yaklaşımlarının karşılaştırmalı analizine dayanan makalemiz, uygulayıcılar, şehir plancıları, politika yapıcılar, destekleyici kuruluşlar ve araştırmacılar için UPA'yı başarılı kılan koşulları iyileştirme ve herhangi bir kentsel bölgede karşılaşılan engelleri azaltma çabaları konusunda eşit derecede değerli olabilecek iyi uygulamaların ve bundan çıkarılacak derslerin kapsamlı bir listesini sunmaktadır.

Anahtar sözcükler: Yenilikçilik; yönetişim mekanizmaları; yer duyarlılığı; sürdürülebilirlik; kentsel ve kent çevresi tarımı.

Received: 25.08.2024 Revised: 01.05.2025
Accepted: 07.06.2025 Available online date: 25.08.2025
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TMMOB Şehir Plancıları Odası

1. Introduction

Local policy-making has not traditionally been focused on food planning, leaving food systems to be regulated by businesses and corporations (FoodTrails, 2021). However, increasing awareness of the environmental and societal impacts of food systems has led to a surge in urban and peri-urban agriculture (UPA) initiatives (Hassanein, 2003; van de Griend, 2019). These initiatives provide fresh, local food to those who are involved in them and to their social networks, and play a vital role in addressing multifaceted challenges to urban development. Social exclusion, economic inequalities, environmental sustainability, as well as vital urban innovations are successfully addressed by various UPA activities (Lohrberg et al., 2016; Prové, 2018; Cassatella et al., 2020). These universally desired outcomes are on the agenda of individual cities and were recognized as one of the Sustainability Development Goals of the United Nations as SDG 11 – "Sustainable Cities and Communities" which aims to make cities inclusive, safe, resilient, and sustainable (United Nations, 2015). This is legitimizing the emergence of UPA as an important component of sustainable urban planning and has made research in UPA governance a relevant undertaking for scientists, as well as for local authorities and civil society.

The beneficial role of UPA in all dimensions of sustainable urban development – social, economic and environmental – has been showcased extensively in urban planning literature (Gündel et al., 2000; Dubbeling et al., 2010; Lohrberg et al., 2016; Pradhan, 2024). The positive outcomes of UPA are not inherent to them, though and, as demonstrated by Pradhan et al. (2024), there are a number of policy and practice hurdles that need to be overcome in order for UPA to be able to offer sustainable solutions to local urban challenges.

We claim that it is the governance structures and processes of UPA initiatives that significantly influence their outcomes. Therefore, the aim of our research, based on empirical data from 15 case studies, is to discern specific governance mechanisms and structures that make UPA initiatives more likely to succeed in offering innovative and place-sensitive solutions to urban challenges, while also remaining sustainable in the long run. The article provides in-depth analysis of UPA governance characteristics across three main stages of UPA evolutionary development that we categorize as initiation, implementation, and maintenance. It aims to answer three research questions: *Are there distinct characteristics of UPA governance models that impact the sustainability of UPA practices, here understood as longevity of the initiatives and their integration into the urban context? How does UPA contribute to urban innovation, and what governance factors enhance its innovativeness? How do UPA initiatives address local urban challenges, and what governance characteristics make them place-sensitive?*

The analysis was performed within the research framework of the European Forum for Urban Agriculture project (EFUA), funded by the European Horizon 2020 research and innovation programme.

2. The Conceptual Framework

The key concepts we work with in this article are interpreted in various ways in literature and mainstream discourse, therefore a short framing of the way they are understood and used here is necessary. Additionally, we briefly present the typology of UPA initiatives implemented, to clarify the scope and diversity of the gardening and farming activities under study.

2.1. Governance

Urban and peri-urban agriculture (UPA) is conceptualized as a multifaceted phenomenon encompassing land use, social practices, and economic activities, echoing the perspective of McClintock et al. (2021). This article adopts their framework to explore UA governance beyond traditional policy-making and local regulations, emphasizing the complex interplay of social practices, institutional arrangements, and power dynamics. These elements are examined in relation to their role in initiating, coordinating, steering and maintaining UPA practices, and in terms of a UPA initiative's relationships with external local actors, and among members of the initiatives themselves. Drawing on Pieterse (2000), urban governance is here understood as a collaborative endeavour involving local government, civil society organizations, and the private sector. This collaborative model is contrasted with hierarchical decision-making approaches, highlighting its importance in fostering sustainable urban development and enhancing democratic participation (Jansen et al., 2006). This perspective guides the present analysis of how governance processes in UPA can integrate diverse stakeholders and facilitate inclusive decision-making, as elaborated by McClintock et al. (2021).

The article situates governance processes within UPA as both an object and an outcome of governance efforts. It explores how external policies and instruments formalize UPA management (McClintock et al., 2021), while also examining how everyday practices shape governance outcomes through grassroots initiatives and stakeholder engagement. This dual perspective informs our understanding of UPA governance dynamics, emphasizing the iterative process of problem-solving, solution-building, and norm-setting (McClintock et al., 2021).

While acknowledging the crucial role of state and local governments in UPA governance (Halloran & Magid, 2013; Lovell, 2011), the article adopts a multi-actor perspective. It considers the contributions of UPA practitioners, supportive organizations, and broader public perceptions in shaping governance outcomes. Prové's insights into decision-making processes within UPA communities further enrich the analy-

sis, highlighting the role of governance in defining goals, methods, and inclusivity within UPA practices (Prové, 2018).

The literature offers numerous UPA governance models and typologies. These range from classifications based on who initiates UPA (Bródy and de Wilde, 2000) to models considering the state and level of formalization, exclusion, resistance, and re-visioning of UPA policies (McClintock et al., 2021). Additionally, there is the classical dichotomy of "top-down" and "bottom-up" models, depending on whether the driving force comes from authorities with executive power or from citizens directly impacted by the governance intervention (Jacob & Rocha, 2021). In this article we have adopted the top-down/bottom-up governance model approach, utilizing three subtypes: (1) bottom-up models, where the gardeners involved decide what should happen and how, often supported by environmental and other relevant organizations, as well as activists; (2) top-down models, where the decision-making lies in the power of the local authorities or other public institutions, and practitioners are not actively engaged in setting objectives, planning and management; and (3) hybrid models, where formal institutions of power and members of civil society participate collaboratively and equally in the UPA governing processes.

2.2. Innovativeness, Place-sensitivity and Sustainability

This article focuses on how UPA governance models and practices impact three desired UPA outcomes: innovativeness, capacity to solve specific local economic, social or environmental problems, referred to as place-sensitivity, and UPA sustainability over time.

In line with United Nations (2015) SDG 11, the innovation potential of UPA in our research means fostering an environment where new ideas, relations, networks, and technologies can be developed. In this article, several aspects of UPA's role as an innovator are studied. Firstly, its contribution to doing agriculture in new ways, developed under the pressure of urban restrictions on land and resources (Orsini, 2020; Thomaier, 2017). Secondly, UPA is viewed as an innovative phenomenon not only when it provides good opportunities for agri-innovation but also provides grounds for new social and business networks, applying a multi-actor approach to addressing urban planning and development issues (Critchley et al., 2007). Thirdly, UPA could take over the role of an innovation incubator that brings new practices and solutions back to the countryside and improves urban-rural linkages (Skar et al., 2015). Lastly, the innovativeness of UPA is also related to its potential for addressing specific social, health, climate, and food and waste problems that urban residents face (Lohrberg et al., 2016).

We are also interested in the overall relevance of UPA initiatives to pressing local challenges. We call this aspect of UPA initiatives "place-sensitivity." It refers to (1) the formal claims a UPA initiative has on addressing specific urban issues; (2) measurable results that demonstrate effective solutions of urban problems brought about by the initiative; and (3) deliberate involvement of UPA actors in interaction with other urban stakeholders in order to address broader urban problems such as social exclusion, food security, unemployment, etc.

Lastly, UPA's sustainability is defined here as its long-term viability and the likelihood of its engaging both citizens, local governments and other stakeholders, based on its lifespan, human, material and financial resources, as well as the density of its support network.

2.3. UPA Types and Relevance for the Research

While UPA studies are abundant in scientific research and mainstream media, defining UPA remains challenging. Definitions vary depending on factors such as engagement with urban economic and environmental systems or production locations (Pickard, 2022). This article adopts a broad definition of UPA to capture its diversity of forms, production methods, business models, and stakeholders, and to understand its integration into urban and peri-urban areas through innovativeness, place-sensitivity, and sustainability of UPA practices. However, in order to distinguish specific governance practices and mechanisms that are typical for certain UPA practices and not others, we have implemented the UPA typology of Jansma et al. (2024), who discern six types of gardening and farming activities in and around cities (Table 1). These types are clustered around the initiatives' characteristics along four practice dimensions: the spatial dimension (where in the city and on how big a plot the initiatives takes place, indoors or outdoors, etc.); the production dimension (what types and varieties of products the initiative produces); the operational dimension (is the produce sold, who consumes it); the community dimension (who is responsible for maintaining the initiative and whether it is open to leisure and other community activities).

In our study, it was observed that urban farms, zero-acreage initiatives, and social farms exhibit similar governance characteristics and positive outcomes, just as community parks, DIY gardens, and community gardens do. This observation suggests that these similarities likely arise from the differing primary objectives of these two type groups: the former primarily focus on profit, while the latter emphasize community empowerment and post-materialistic values. Therefore, we qualify each of the six UPA types from Jansma et al. either under the heading "for-profit" or under the heading "not-for-profit" UPAs.

As illustrated in Figure 1, the conceptual framework aims to link governance dynamics within diverse UPA initiatives and their potential to demonstrate sustainability, innovativeness, and place-sensitivity. As highlighted above, the conceptual model includes all types of UPA initiatives – both the commercial ones which we have called "for profit," and "not-for-profit" initiatives oriented towards creating non-material and common goods.

Table 1. UPA typology according to Jansma et al. (2024)

Urban farm	Commercial UPA initiative, with a wide variety of products, usually on large areas of land
Community park	UPA initiative that combines food production with a landscaped space, where community involvement and non-food activities are common
Do-it-yourself (DIY) garden or park	UPA initiative aimed mostly at individual production of food for own consumption, without additional leisure activities
Zero-acreage farm	UPA initiative where food is produced utilizing small spaces that may not be on the ground, but on raised spaces, afloat or on rooftops, and produce is usually sold
Social farm	UPA initiative where food production is combined with healthcare services or other activities that help the disadvantaged
Community garden	UPA initiative where community building activities and social aspects are more prominent than food production

UPA: Urban and peri-urban agriculture.

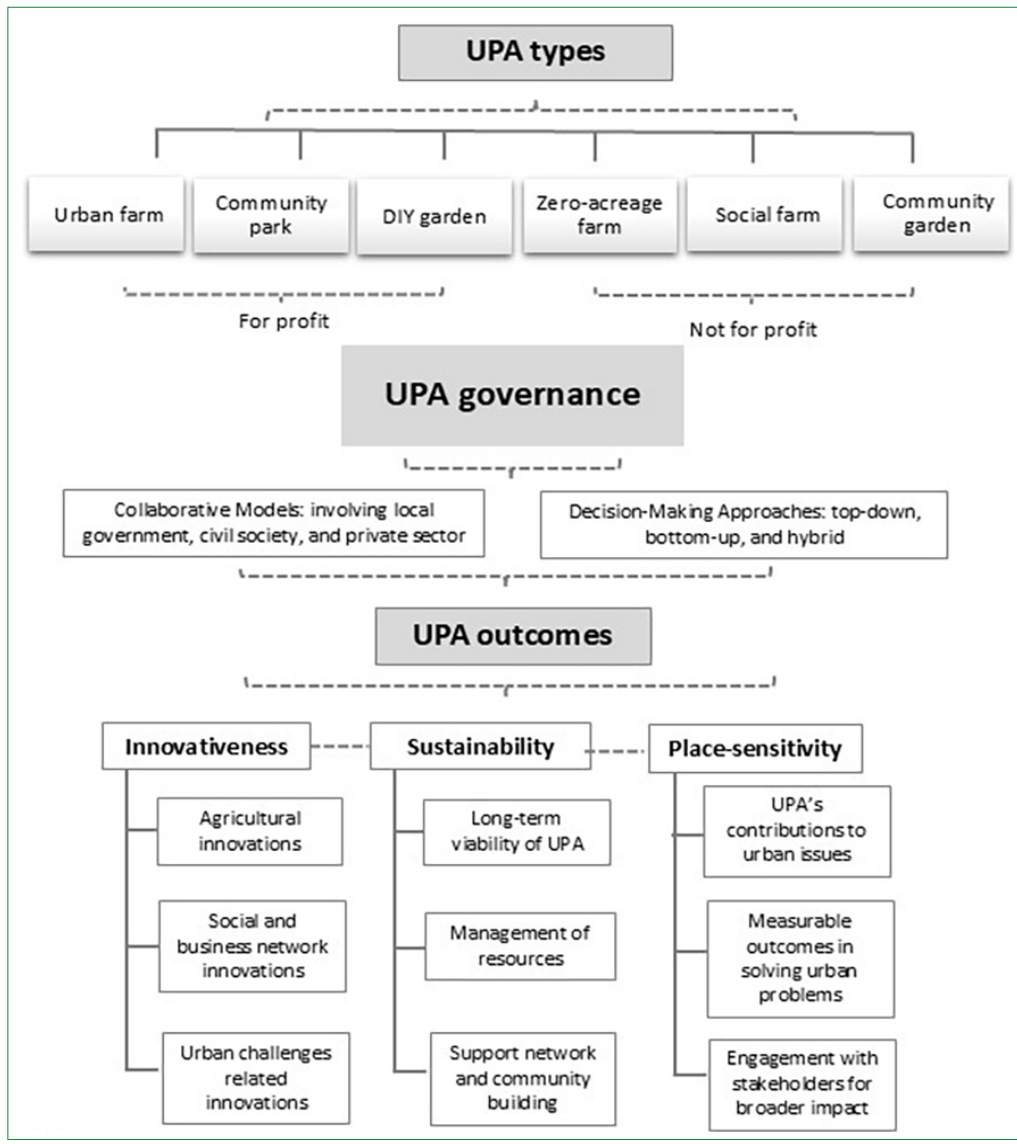

Figure 1. Elements of the conceptual framework.

Table 2. Indicators to measure desired outcomes in 112 UPA initiatives

Sustainability indicators	Innovativeness indicators	Place-sensitivity indicators
Longevity of the initiative: • Initiatives under 5 years (1 point); • 5 to 10 years (2 points); • Over 10 years of existence (3 points). Access to resources: (A point for each sub-indicator) • Ownership or long-term lease rights of the land; • Access to processing facilities; • Renewable energy, water and waste-recycling resources; • Diversity of supporting partners – a point for each category of eleven possible ones, including individuals, municipality or municipality-owned companies, private companies, public institutions such as schools and hospitals, social enterprises, etc.	Planned and unplanned outcomes under the following categories: (A point for each sub-indicator) • Creating alternative food chains; • Productive reuse of vacant and derelict urban sites; • Novel agricultural methods such as permaculture and vertical farming; • Experimenting with growing plants in unfavourable climate conditions	Positive local community impacts across social, economic, environmental, and spatial dimensions: (A point for each sub-indicator) • Social cohesion and poverty alleviation (through food security, job creation, self-sufficiency); • Landscape and cultural heritage preservation; research and education, including early childhood education (literacy, social learning, training); • Health (recreation and health care); access to quality food/diet; • Soil protection; • Biodiversity (including traditional seeds protection); • Circularity (renewable resources, water retention); • Climate change mitigation (including through multifunctional green spaces).

UPA: Urban and peri-urban agriculture.

3. Research Methodology

The case studies analysed were selected from 112 UPA initiatives across Europe and beyond that took part in an online survey carried out as part of the EFUA activities (Jansma et al., 2024). The survey consisted of 50 questions, including several that provide data about the indicators for measuring initiatives' sustainability, innovativeness, and place-sensitivity. Table 2 summarizes the indicators and sub-indicators we have used to identify and quantify the three desired UPA outcomes using EFUA questionnaire data.

To identify specific cases to explore the link between governance model, sustainability, innovativeness, and place-sensitivity we focused on two criteria: the most geographically and functionally diverse initiatives and cases that demonstrated the best results related to the three desired UPA outcomes.

For each type of desired outcome, we scored the cases on all the respective indicators, as listed in Table 2, using the scoring approach provided in the table. Then, choosing from the highest scoring cases, we selected three from each of the six UPA types, so that together they constitute the most diverse sample in terms of geographical location. After taking into consideration specific challenges in data accessibility and respondents' availability, three cases had to be eliminated and two substituted by other initiatives from the survey with equivalent scores, resulting in a final selection of 15 cases. For a summary of the case selection process see Figure 2.

Data on two context indicators were also collected in the online survey – *type of settlement* (city, town, peri-urban) and *existence of local policy related to UPA* (e.g. food policy, urban planning). This was done to grasp the diversity among cases and to facilitate understanding of the impact of the local policy context on the desired UPA outcomes. During the analysis of the cases, additional in-depth questions on the policy context were asked. The local culture and attitudes towards UPA were also taken into account. Both types of indicator – related to the desired outcomes and context indicators were cross-analysed in each case, and then cases were compared.

While it is clear that the success of UA initiatives in fostering innovativeness, sustainability, and place-sensitivity relies on a dynamic interplay between contextual factors (such as policies, cultural values, socio-economic conditions and where in or outside the city the initiatives are located), and internal governance characteristics like leadership and organizational dynamics, our research highlights a key finding: *the ability of governance practices to adapt to and even influence local conditions is the primary determinant of outcomes*. Supportive con-

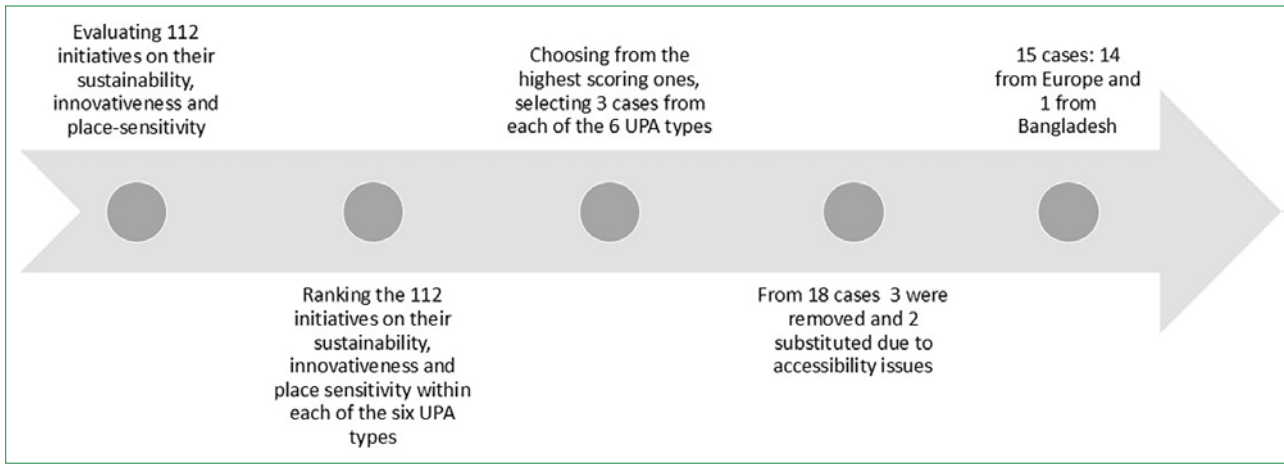

Figure 2. Case selection process.

UPA: Urban and peri-urban agriculture.

textual factors provide a strong foundation, but it is the responsiveness and adaptability of governance that ultimately drive success. Therefore, *our primary focus is on the process of reaching beneficial UPA outcomes, in environments fostering UPA and in less UPA-friendly contexts alike, aiming to show transferability of UPA governance models beyond the policy and spatial context.* As visible from the country and city locations that are included in this case-study selection (Table 3), we have aimed for geographical, socio-economic, cultural, and historical diversity of UPA representations, including a case from a less developed country outside Europe.

After the case selection procedure based on the EFUA survey and elaboration of the indicators, the next step was to conduct in-depth case study research through qualitative methods.

Each case study was researched using both secondary sources (reports, media publications, project websites) and primary data gathered through semi-structured interviews. Between one and four interviews were conducted per case study, ensuring representation from key stakeholders within and outside the UPA initiative. Primary and secondary data on each case was collected and analysed by the partner responsible for it who then entered the aggregated data into a reporting template, organized in thematic sections. To ensure a systematic and rigorous analysis of the case study data, the authors of this article developed a thematic coding framework aligned with the semi-structured questionnaire and standardized reporting template used for the 15 case studies. This framework was applied to code the data from the reporting templates. This methodology enabled us to derive meaningful insights while maintaining a strong connection between the research questions, data collection, and analysis.

The coding followed Braun and Clarke's (2006) six-phase framework, which provided a robust foundation for identifying and synthesizing patterns within the data. The first phase involved immersing ourselves in the data from the reporting templates through repeated reading, allowing us to conceptualize preliminary themes. Next, data segments were systematically grouped into relevant categories to ensure comprehensive organization. Broader, cohesive themes were then identified by synthesizing related patterns, enabling us to explore key relationships, such as between governance models and stakeholder engagement. In the fourth

Table 3. UPA types and geographical distribution of case studies (lifespan is at the time of data gathering – 2023)

UPA type	Urban farm	Community park	DIY garden	Zero acreage	Social farm	Community garden
Cases	Turin, Italy	Glasgow, UK	Loures, Portugal	Brussels, Belgium	Dobrich, Bulgaria	Thessaloniki, Greece
	>10 years	>10 years	5–10 years	5–10 years	5–10 years	<5 years
	Sofia, Bulgaria	Copenhagen, Denmark	Bergen, Norway	Sofia, Bulgaria	Dundee, UK	Rome, Italy
	5–10 years	>10 years	>10 years	5–10 years	>10 years	5–10 years
	Ghent, Belgium			Dhaka, Bangladesh		Sofia, Bulgaria
	<5 years			>10 years		<5 years

UPA: Urban and peri-urban agriculture; DIY: Do-it-yourself.

phase, themes were rigorously reviewed for accuracy, clarity, and distinctiveness. We iteratively refined these themes to resolve ambiguities and ensure analytical relevance. The fifth phase involved defining and naming themes, articulating their boundaries, and explaining their significance to the research objectives. Finally, the sixth phase synthesized these themes into a cohesive narrative, integrating illustrative excerpts to ground the findings in the data.

Following this approach, the coding process was structured around main themes and sub-themes, serving as analytical categories to interpret the dynamics of UPA initiatives. These themes are related to the above-mentioned key indicators describing governance mechanisms, desired UPA outcomes, and local contexts.

Each theme corresponded to specific questions in the data collection process, ensuring alignment with the study's objectives and capturing key governance practices, achievements, external relations, inclusion, success factors, and barriers. Internal governance aspects included leadership roles, organizational processes, conflict resolution strategies, and interactions with external stakeholders and institutions, while external governance factors were assessed in terms of local authority involvement and collaborative mechanisms. This comprehensive approach allowed the analysis to identify governance practices, along with the enablers and barriers that influence the sustainability, innovativeness, and place-sensitivity of UPA initiatives.

After the data collection, during the coding process a common pattern of governance challenges and processes was discerned across all cases that differed depending on their evolutionary stage, which we categorized as *initiation, implementation, and maintenance*. By adding this complementary analytical approach, we not only managed to differentiate the evolutionary governance characteristics of UPA initiatives, but also to systematically examine critical success factors and barriers for achieving sustainability, innovativeness, and place-sensitivity.

The analysis of *the initiation* stage provides valuable insights into the foundational elements of UPA initiatives. It illuminates the origins of each UPA initiative, including the diversity of actors who initiate them, initial goal-setting processes, and strategies for securing necessary resources. Understanding these early dynamics is crucial as they lay the groundwork for the entire initiative, setting its trajectory and shaping its goals.

The analysis of *the implementation stage* shifts the focus to the decision-making processes within UPA initiatives. This phase explores how decisions are made, which actors are involved, and the leadership qualities that prove pivotal to success. It examines the roles and interactions of external stakeholders, such as local authorities and community organizations, highlighting their influence on project outcomes and sustainability strategies.

Lastly, the analysis of *the maintenance stage* zooms in on the governance mechanisms that sustain UPA initiatives over time. It examines both internal governance practices within the initiative – such as organizational structures, decision-making frameworks, and conflict resolution mechanisms – and external governance dynamics involving relationships with broader societal actors and policy environments. At this stage we identify key factors that contribute to the long-term sustainability, innovativeness, and place-sensitivity of UPA initiatives (Fig. 3).

By employing this comprehensive three-stage approach, the study both deepens our understanding of the complex interplay between UPA outcomes, governance mechanisms and local context, and provides actionable insights for enhancing the effectiveness of urban agriculture policies and practices. It sheds light on the challenges and opportunities inherent in UPA development, offering a structured framework for future research and policy formulation aimed at fostering UPA.

4. Results

The results section is structured in a way to illuminate the foundational elements and UPA governance characteristics that lead to improved chances for innovativeness, place-sensitivity, and sustainability. The results are presented for each UPA developmental stage, followed by short and practical take-away lessons for policy-makers and practitioners.

4.1. UPA Governance Characteristics Towards Success

4.1.1. At the Initiation Stage: Actors, Goals, and Resources

Our case studies show that at the initiation stage the most important governance challenge is *to set out clear goals and to ensure all the actors involved have a common understanding and commitment to them, while at a later stage achievement of UPA goals depends on leadership role and skills, the involvement of local authorities, and the broader political and cultural context.* The initial goals of the cases studied fell into four broad categories: food production, greening urban spaces, social inclusion. and nature-based education expressing various place-sensitivity approaches. Not all initiatives achieve all their initial goals but many achieved positive outcomes that were not originally expected, thus confirming the nonlinearity of innovations.

Actors and initiators themselves do not have to have any specific profile: across the 15 cases studied, we found a diverse mix of actors – both directly involved in the UPA activities and external supportive organizations. Their skills and experience in farming vary widely. Urban farm initiators may have farming expertise alongside skills from other sectors like engineering, law, sports, and veterinary science. Initiatives, especially for-profit ones, such as zero-acreage farms (Belgium, Bulgaria, Bangladesh) may be started by professionals transitioning

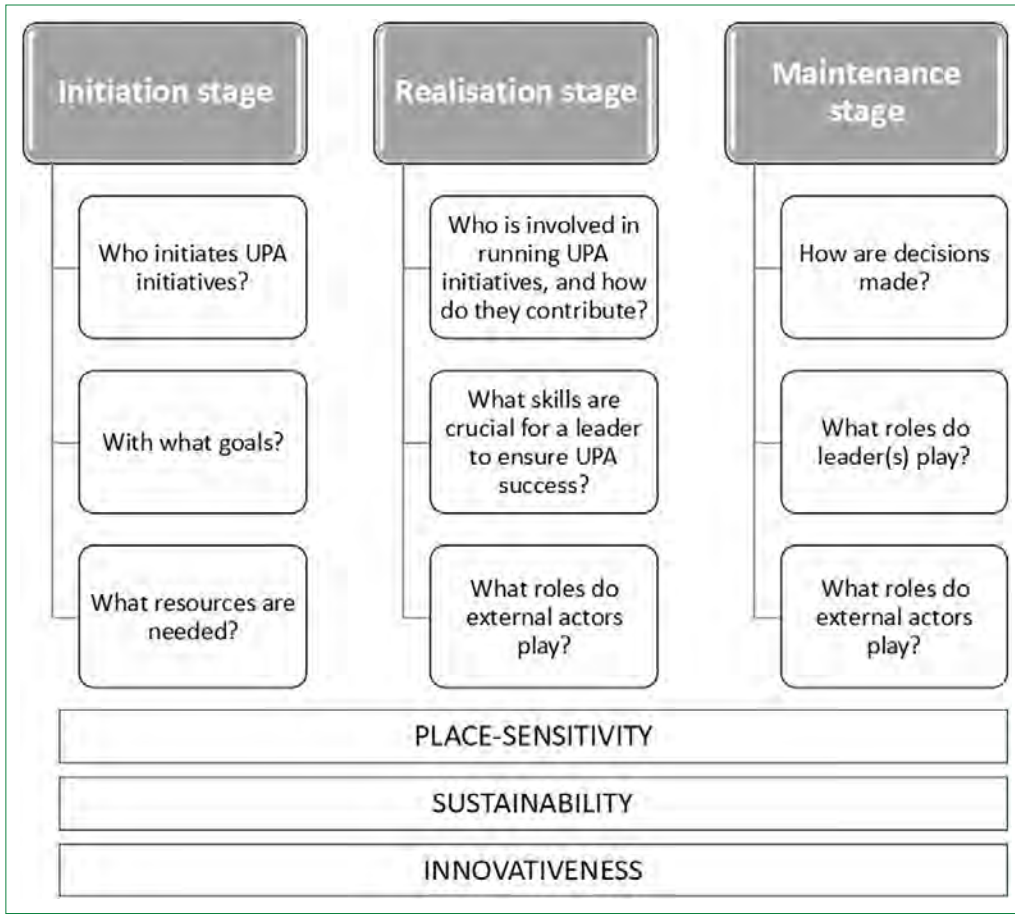

Figure 3. Three-stage approach to studying UPA governance characteristics and their outcomes in terms of sustainability, innovativeness, and place-sensitivity.

UPA: Urban and peri-urban agriculture.

from unrelated fields, driven by vision and determination rather than agricultural experience. Social farms (Bulgaria, United Kingdom), focusing on social benefits rather than profit, are initiated by individuals facing specific challenges or proactive organizations, regardless of their experience with agriculture. Community gardens (Greece, Italy, Bulgaria), DIY gardens (Portugal, Norway), and community parks (United Kingdom, Denmark) are established by passionate individuals such as environmental activists, landscape architecture students, or local municipalities in collaboration with EU-funded projects. Participants in these initiatives come from various backgrounds, including retirees, part-time or full-time employees, and individuals of varying social and financial status. For instance, social farms may involve patients from local hospitals or individuals with disabilities seeking physical and mental well-being through gardening. In community gardens and DIY projects, participants range from experienced gardeners to novices, all united by a desire to grow food and foster community connections. This diversity of actors and participants underscores the inclusive and multifaceted nature of UPA initiatives and reflects the needs of local communities.

Another important governance element at the initial stage of a UPA initiative is the conceptualization of *what resources it will need and how they will be secured*. Unless it is an already established initiative – whether for profit or not – that is generally only handed down through generations or institutions, the planning of funding and securing the needed start-up resources is crucial. In the cases where the initial undertakings were entirely based on voluntary work and informal engagement in the UPA activities, this "starter" energy could be powerful enough to sustain the activity and dedication of personal resources over a sufficiently long period (Denmark, Norway). This may include heavy physical work like clearing dead vegetation (UK, Norway), constructing gravel paths (Portugal), etc. and also networking efforts such as kindling enthusiasm for the initiative in the neighborhood, community building and fundraising – and all this over at least one year (Denmark, Norway, UK). Still, all the cases show that no matter how enthusiastic and resourceful these initiators and "motivational" leaders are, their energy has limits and over a period of a few years most of them declare that they have lost their enthusiasm if they do not receive community support and meet with commitment

from other actors. Therefore, it is not the hard physical work but social limitations that appear to be one of the most important factors for UPA success. Alternatively, in the cases where initial external funding was secured at the very start due to supportive local or national institutions or private partners, this funding is also not unconditional. It requires constant efforts to secure it in the long term and, once again, community support is needed (Portugal, Greece, Bulgaria). Finally, in the case of for-profit farms, typically the zero-acreage ones, the initial investment is significant and most, if not all of it, comes from the personal savings of the investors. In one of the cases (Belgium) the two business partners quit their full-time jobs and risked all their savings in their UA vertical garden project, which resulted in their living in deepening stress over a period of almost a year. This creates insecurity that requires a lot of personal stamina and determination, not least because it affects the personal relations of the investors with their family and friends. Therefore, it is very important that at the initial stage all the people and organizations involved have a clear view of how they will deal with sourcing the initiative in its first stages (not least financially), but also to have strong and tangible community support, and relevant expertise.

Lessons learned:

- Clear goals and securing diverse funding sources are fundamentally important. By combining grants, public funds, and private investments, projects can enhance financial resilience and mitigate dependency on any single source. Crowdfunding and social investment funds attract diverse financial support while fostering community involvement and ownership.
- Early, strategic planning for human capital and expertise is crucial to sustaining project activities. Ensuring skilled personnel and knowledge supports long-term viability.
- Introducing advanced agricultural technologies such as vertical farming and hydroponics improves efficiency and sustainability, leading to better resource management and higher yields. Experimental pilot projects test and refine new ideas, promoting a culture of innovation and adaptability.
- Conducting community needs assessments ensures that initiatives address local priorities and challenges.
- Engaging local stakeholders in planning builds trust and collaboration, while respecting local traditions enhances cultural sensitivity and acceptance.

4.1.2. At the Implementation Stage: Leadership and Networking

The results indicate that UPA governance models seem linked to the type of initiative, with governance dynamics often shaped by the resources and capacities of those involved. While initiators frequently take the lead, in cases such as social farms (Bulgaria, UK), urban farms (Italy, Bulgaria, Belgium), and community gardens (Greece, Italy, Bulgaria), governance may shift to other actors who contribute valuable resources or expertise. This variability in leadership and resource distribution is reflected in the three distinct UPA governance models identified in our analysis: top-down, bottom-up, and hybrid models.

Top-down governance is usually established by public institutions which aim to formalize UPA through regulations or which implement EU-funded projects related to agriculture and food (Portugal, Italy, Greece). For instance, an urban vineyard in Turin, Italy, is managed by the national Ministry of Culture, which also initiated the project. Public institutions often play a key role in creating and implementing guidelines that shape urban agriculture management.

Bottom-up governance involves gardeners making decisions about how the UPA initiative operates and distributing responsibilities among participants. Most of our bottom-up cases, excluding zero-acreage initiatives, are managed by individuals or non-profit organizations addressing specific place-sensitive issue. This model is commonly driven by environmental NGOs, activists, parents' associations, and new farmers. Biodiversity, health, and education are among the key place-sensitive issues that bottom-up UPA addresses. More specific goals are derelict urban land regeneration (UK), finding alternative outdoor playgrounds for children (Norway), integration of disabled adolescents (Bulgaria). Key internal governance features include a leader or a small leadership team that manages the UPA, makes decisions, and coordinates tasks. Decisions are then communicated to the broader group, with varying levels of involvement in decision-making. In some cases, a core group of three to five gardeners work closely with leaders, supporting decision-making and coordinating with thematic subgroups. This model, exemplified by "sociocracy" in urban woodland gardens (Norway) emphasizes personal responsibility, fostering ownership, and engagement. In zero-acreage UPA initiatives (Bulgaria, Belgium, Bangladesh) involving one to five individuals, decision-making is concentrated in the manager/owner or a close team due to the specialized nature of their operations. This focused approach is essential for efficient management, as seen in cases where a tandem acts as a single entity, reflecting strong unity and close personal relationships. Bottom-up initiatives thrive in both UPA-friendly policy contexts (such as Belgium, where UPA is supported not only administratively, but financially as well), and in countries where UPA is not supported by any policy (Bulgaria, Bangladesh).

The hybrid model combines bottom-up and top-down influences. In this model, gardeners make primary decisions but rely on top-down support for achieving goals and development. For example, a community garden might involve active gardener participation under municipal oversight, thus benefiting from access to land, provision of water, and support through external projects (UK, Portugal, Norway). Similarly, a social farm governed by a board of trustees, including ini-

tiators and stakeholders like charities and public administrations, demonstrates this approach (UK). Community park initiatives follow this model as well, where local institutions provide resources, training, and financial support (UK, Denmark). The hybrid model shows how certain actors, by offering resources like land, knowledge, or funding, can assume dominant decision-making roles. This dynamic illustrates that UPA governance leadership is not fixed; initiators may transfer governance to resource providers due to limitations in skills, knowledge, or administrative capacities.

Based on the present analysis, the hybrid model appears most successful at the implementation stage. It combines grassroots volunteer energy with political vision and commitment to UPA. Volunteers initiate actions and then seek material support from municipal or state institutions, which helps facilitate local ideas and initiatives. This approach fosters ownership and strengthens responsibility within the project. All hybrid governance initiatives enjoy a supportive local policy context, but this is still not enough for an initiative to flourish if it is not widely recognized by locals and they do not consider it to be valuable (Portugal). This is where the importance of effective leadership comes into effect and leaders who succeed in convincing the local community and policymakers of the benefits of UPA have managed to secure UPA's sustainability in the long run (Denmark, UK).

Our cases underscore the vital role of UPA in understanding and engaging with policy frameworks, whether they function within supportive policy environments or in their absence. Proficiency in support mechanisms, regulations, and relationships with public administrators streamlines administrative processes, ensures legal compliance, and enhances governance efficiency. Collaborating with the policy context can provide access to critical information and resources, positively impacting initiative sustainability. For example, a community garden in Glasgow sought early support from local and national public authorities, securing resources like land and funding crucial for sustainability. In a zero-acreage initiative in Brussels a knowledgeable initiator, leveraging legal expertise, successfully accessed local funding for urban food production. Political advocacy by individual politicians also played a pivotal role in supporting UPA initiatives in regions lacking specific agricultural policies, emphasizing the significance of strong political relationships. Even in cases where grassroots representatives lacked personal political connections, lobbying skills and relationship-building with relevant institutions proved invaluable. These skills are essential for navigating public institutions, securing grants, and establishing credibility for future engagements with stakeholders like investors or clients. Training UPA managers in policy alignment and leadership goals, alongside experience in management and communication, fosters transparent decision-making processes and builds trust within UPA initiatives. Conflict resolution skills are also crucial for internal governance, particularly in resolving disputes between leaders and non-leaders over objectives or farming methods. Successful conflict resolution involves acknowledging diverse perspectives and values to reach mutually acceptable decisions. An entrepreneurial spirit is a common trait among UPA leaders, enabling them to identify and leverage available resources for profitable or community-focused initiatives. Experience in running social-inclusion projects enhances communication skills and connections with supportive institutions. Municipalities with innovative, proactive officials can drive innovation, sustainability, and community engagement in UPA, offering creative solutions like tax waivers for infrastructure development.

Based on these findings we may conclude that the success of UPA initiatives depends on a multifaceted skill set that includes policy acumen, relationship-building with public institutions, entrepreneurial drive, conflict resolution abilities, and a commitment to community engagement. By navigating policy landscapes, leveraging resources, and fostering collaborative partnerships, UPA leaders can create sustainable and impactful projects that benefit both communities and the environment.

Another key element of UPA governance at the implementation stage is *the role of strategic partnerships* in the success of UPA initiatives, whether established early in planning or later in development. These collaborations not only grant access to vital resources but also foster community engagement and attract supporters to achieve shared objectives. For instance, social farms in our study formed partnerships with organizations sharing similar aims, such as the National Health Service, to integrate hospital patients into farming activities based on their physical abilities (UK). Establishing relationships with public administrations and local authorities proved essential for gaining support and recognition. Collaboration with diverse entities offers a range of resources that influence business success, from funding and expertise to policy support and visibility. There are some cases where the market is a more important context compared to the political situation. For example, the clients remain the most important external partnership for all zero-acreage farms. Therefore, where initiatives have been successful, they have managed to offer impeccable organization in the delivery process, and a nice-looking and tasty product for the end consumers. This skill goes hand-in-hand with the ability to take a risk, but also to assess the needs of the urban market, and one's own production capacities.

Lessons learned:

- During the implementation stage, forming strong partnerships with public institutions is essential. These partnerships can provide ongoing funding, regulatory support, and legitimacy, crucial for continued success.
- Active community engagement fosters ownership and long-term support for the project's goals.

- Efficient resource management practices, aimed at reducing waste and increasing productivity, contribute to sustainability.
- Continuously adopting advanced agricultural technologies is key to boosting productivity and addressing new challenges.
- Cross-sector collaborations with education, health, and business sectors give rise to diverse expertise and resources, enriching the project's impact.
- Tailoring governance models to local contexts ensures their effectiveness and relevance; aligning initiatives with local cultural practices enhances their acceptance and integration, and ensures the project meets local needs and priorities.
- Governance models that blend top-down and bottom-up approaches create inclusive decision-making processes, leveraging the strengths of both approaches.

4.1.3. The Maintenance and Development Stage: Sustaining the Momentum

While the first steps of a UPA initiative and the subsequent short-term implementation of its goals depend on a limited set of practice and governance characteristics, the factors for the success of these initiatives in the long run seem to be less easy to define. This is due to the prolonged influence of less evident contextual characteristics and a more intricate interplay between diverse actors' interests and needs, but also because of less predictable circumstances like economic, geopolitical, and even climate changes and crises. Still, the present data provides insights into some of the factors for long-term sustainability, innovativeness, and place-sensitivity.

While contextual factors provide a foundation for governance success, *internal governance characteristics – such as leadership and organizational dynamics – are equally important in mediating the influence of these external conditions*. Visionary leadership, as observed in social farms in Bulgaria, Belgium and in a DIY farm in Denmark, enables initiatives to navigate complex policy landscapes, foster partnerships, and mobilize resources effectively. Participatory governance models that emphasize inclusivity align closely with local needs, ensuring adaptability and sustained stakeholder engagement. However, weak leadership, rigid governance or lack of community support structures can hinder progress, even in favourable contextual conditions, underscoring the critical interplay between internal practices and external environments.

Different types of UPA initiatives exhibit unique dynamics regarding success factors and barriers. Community gardens thrive on grassroots participation and inclusivity, with success driven by strong community leadership, partnerships with local governments, and adaptability to local needs. In Scotland and Italy, community cohesion and volunteer networks were critical for overcoming resource constraints, while alignment with municipal policies ensured access to funding and institutional support. However, barriers such as inconsistent policy frameworks, limited resources, and internal conflicts often restrict their scalability and sustainability, particularly in Greece, where formal governance structures are weak.

Social farms excel in integrating agricultural practices with social objectives, such as therapy or employment for marginalized groups. Their success depends on visionary leadership, robust governance mechanisms, and strategic partnerships. In Belgium and Bulgaria, social farms successfully leveraged collaborations with NGOs and public programmes to address socio-economic challenges and achieve financial sustainability. Yet, barriers such as insecure land tenure, limited legal recognition, and dependence on external funding expose these initiatives to economic fluctuations, necessitating adaptive governance to maintain sustainability.

Urban farms operate in more formalized settings, often having to comply with market requirements. Success factors include integration with urban food policies, strategic collaboration with public authorities, and effective market positioning. Urban farms in Italy exemplify how aligning with policy frameworks and maintaining place-sensitive governance enhances sustainability and innovation. However, these initiatives face barriers like regulatory complexity, competition for urban space, and reliance on market conditions, which can constrain their capacity to balance financial viability with local adaptability.

Both formal and informal decision-making processes may positively impact UPA in terms of their long-term success. Formal structures are usually represented by collective bodies, such as members of the board or associations which set goals, codify rules, and distribute responsibilities among the UPA initiative members (Bulgaria, UK, Denmark, Norway, Portugal). The rules and responsibilities are usually codified in written documents that provide management transparency, reduce the level of uncertainty among the initiative's members, and provide compliance of the initiative's activities with the various regulatory frameworks. However, practices without written rules and formal collective bodies can also have clear functions, responsibilities, and decision-making processes, especially in UPA initiatives with fewer members, such as zero-acreage farms. Although democratic decision-making is very common, some practices are steered by a leader, assisted only by a small group of practitioners without the participation of the rest of the members of the initiative (Greece, Bulgaria). Both types of decision-making could have a positive impact on an initiative's sustainability over time in terms of participants' dedication to the initiative, as long as all the members support the respective decision-making process, and they trust it.

Regardless of the type of decision-making process, *the role of the leader* – be it an individual or a team – *seems crucial in terms*

of sustainability and place-sensitivity. As during the implementation stage, having experience in management or in developing projects, knowledge of how to engage people and to solve conflicts, and the ability to use available resources, being able to identify external supporters and to form partnerships, are skills that ensure the sustainable development of initiatives and establishment of long-lasting, trusting, and solidarity-based relations among the participants. As leaders are such key figures in any UPA initiative, provided that they concentrate unique qualities, knowledge, connections, and expertise, it is a good strategy to share these with other members or supporters through training sessions, formal and informal meetings, inclusion in various activities and networking, in case the initiative has to part with its leaders for any reason (Denmark).

A key factor enhancing the place-sensitivity of an initiative that was revealed by our analysis is its inclusivity. Many initiatives actively engage citizens, businesses, and policymakers in their events, which builds social capital and increases visibility. Similarly, practices that involve sharing surplus produce and fairly redistributing it among members and their networks broaden the circle of participants and foster solidarity and trust. This practice of assessing needs and sharing resources strengthens community bonds. Knowledge-sharing with external actors can also attract new participants, expanding the initiative's reach and multiplying its benefits over time.

The specific location – an inner-city, peripheral or peri-urban setting – does not seem to have an influence on the beneficial outcomes of practices. Rather, it is the location's significance to the community that may influence its development. For example, selecting a location that ensures long-term protection or popularity is a practical strategy for attracting more participants and sustaining the initiative. This is the case with a community garden located near a municipal urban vineyard and orchard in Thessaloniki, Greece; it benefits from this proximity, thus providing a symbolic "protective umbrella" and increased visibility. Being in a busy area maximizes exposure to a diverse audience and helps gain broader public support when needed.

In summary, UPA partnerships enhance sustainability, innovation, and place-sensitivity through a two-way exchange of ideas, knowledge, skills, resources, and funding. While all these elements are crucial for an initiative's development, an initiative can temporarily function without some, except for human resources and funding. Funding is essential for acquiring seeds, materials, and services, which are often necessary for short-term operations. Therefore, maintaining a steady flow of human capital and adequate funding is critical for the initiative's long-term stability and success.

Human resources and human capital play crucial roles in UPA initiatives. In business-oriented models, such as urban farms, zero-acreage initiatives, and social farms, personnel are often paid for their work, whether through direct employment or consultancy. Highly skilled operations or services may require experienced specialists, which can be costly. Conversely, when personnel can be trained in house, the primary requirement is efficiency and adherence to instructions.

A significant challenge arises when relying on volunteers who are not compensated. Even in business models, some initiatives depend entirely on voluntary work. The key issue is the sustainability of this model. For example, one case involved a dedicated volunteer who revived a century-old tradition of school gardens in Copenhagen, Denmark, working tirelessly for over a decade before securing long-term funding. Volunteers across all UPA types exhibit deep commitment, whether to nature conservation, community building, innovative agricultural practices, education, or social integration. This dedication often borders on idealism, driving substantial physical and mental efforts. However, such commitment is not infinite. Active volunteers may leave, especially if they engage in physically demanding tasks like site reclamation, construction, or extensive networking. Typically, a turnover of volunteers occurs every five to eight years, necessitating continuous recruitment efforts for long-term success. Building a network of skilled volunteers can sustain a UPA even if funding is reduced, as seen in a DIY case in Bergen, Norway, where a 50-strong volunteer network persisted despite the loss of municipal funding.

Securing long-term funding presents another challenge, especially for non-profit UPA initiatives whose beneficial outcomes are hard to quantify financially. Outcomes such as improved biodiversity, environmentally responsible behaviour, and enhanced social cohesion take time to manifest themselves, thus making the measurement of their value more complicated. One city's approach to addressing this issue involves asking practitioners to complete questionnaires on key performance indicators, helping authorities to track changes over time and justify continued funding (Denmark). In the case of for-profit UPA initiatives, securing initial funding from business angels can be effective (Belgium). In the long term, maintaining a successful UPA, meaning developing innovative and place-sensitive activities, involves building a reputation as a reliable and experienced entity, thereby attracting clients and partners. This process involves building trust with traders, consumers, and policy institutions.

Regarding policy context, UPA initiatives can achieve long-term sustainability and embeddedness regardless of specific supportive policies. Success depends more on grassroots engagement than on top-down support. Even when municipalities are indifferent or lose interest, active grassroots involvement can sustain activities (Bulgaria). Conversely, top-down initiatives have struggled to build community spirit if it was not already present (Portugal).

Lessons learned:

- At the maintenance stage, regularly adapting financial strategies is crucial for long-term viability.

- Maintaining active stakeholder engagement secures ongoing support, resources, and feedback necessary for sustaining the project.
- Encouraging a culture of continuous learning and improvement drives innovation and excellence.
- Feedback mechanisms refine practices, keeping the project responsive and effective. This includes regularly assessing the project's impact on the community and environment.
- Fairly distributing benefits among residents promotes social equity and cohesion, fostering a strong sense of community.

5. Discussion of Contextual Factors, Success Strategies, and Barriers in UPA Initiatives

5.1. Governance Models and Local Context: A Place-sensitive But not Place-determined Logic

While the governance of UPA initiatives reflects strong sensitivity to local contextual factors – such as land use regulations and zoning plans, institutional density, participation dynamics, and leadership structures – the results from the 15 case studies demonstrate that governance models are not determined by spatial location alone. Instead, they emerge through an interplay of cultural, political, and sectoral influences that shape how place is experienced and navigated. Hence, they are more strongly mediated by cultural norms, policy environments, and sectoral orientation (for-profit vs. not-for-profit).

Land availability and regulation are key structural elements influencing governance. Initiatives operating in contexts with high land regulation often require formal agreements with municipalities or private landowners. These arrangements typically lead to stronger institutional involvement, with local governments and NGOs playing critical roles in initiating and sustaining projects. In such settings, governance tends to be hybrid, combining grassroots energy with formal administrative support. Leadership is often held by NGO actors, entrepreneurs, or policy-savvy initiators – individuals capable of navigating complex bureaucratic systems and securing diversified funding streams. For example, a zero-acreage vertical farm in Brussels was initiated by two entrepreneurs who worked closely with municipal authorities to gain legitimacy and resources, although they did not use public land. Similarly, a community garden in Glasgow began with strong institutional support before transitioning to a more community-led model. A social farm in Bulgaria displays a comparable governance structure: community-driven programming supported by local government involvement and cross-sectoral partnerships. These cases demonstrate that hybrid governance can emerge in diverse contexts, especially where initiatives must balance institutional frameworks with the needs and capacities of local actors.

Participation levels vary depending on the mission and orientation of the initiative. Socially motivated projects – such as educational farms, inclusion-oriented gardens, or commons-based networks – tend to foster broader and deeper participation, especially when leadership emerges from within the community. Leaders in such cases are often teachers, small-scale farmers, social workers, or activists who have extensive knowledge of the local context and are able to mediate between grassroots goals and institutional expectations. NGOs and municipal bodies remain important, but their roles are more facilitative than directive, providing enabling conditions for community leadership to flourish. By contrast, initiatives driven by commercial goals – such as vertical farming or entrepreneurial food ventures – frequently adopt centralized, top-down governance models, prioritizing technical efficiency, scalability, and market responsiveness. This is evident in both Brussels and Sofia, where for-profit actors lead UPA initiatives with minimal community participation but strong logistical planning and investment strategies.

Across all cases, the evidence suggests that hybrid governance is not linked to physical location but emerges wherever initiatives are required to navigate complex stakeholder environments. The structure and style of governance are shaped more clearly by the initiative's mission, its legal and policy environment, and its leadership identity than by its spatial setting. *Governance models are place-sensitive in terms of institutional access, land tenure, and actor relationships – but they are not place-determined.* Governance types align more consistently with cultural, political, and sectoral factors than with geographical location. This finding suggests that effective governance models are transferable across contexts, as long as they are adapted to the specific institutional landscape, community culture, and leadership dynamics in which they operate.

5.2. Success Strategies: Aligning Governance with Context

Building on the understanding that governance models are shaped more by institutional and cultural conditions than geography, this section examines the key strategies that have led to successful UPA implementation. The results from our research show that the success of UPA initiatives is deeply influenced by a complex interplay of contextual factors such as local policies, social structures, and economic conditions. These elements significantly shape governance practices, determining the place-sensitivity, sustainability, and innovativeness of the initiatives.

Policies play a particularly pivotal role in enabling or hindering governance efforts. For instance, in countries like Italy and Belgium, well-integrated urban agriculture policies provide formalized governance structures that facilitate resource mobilization, sustainability, and innovation. These policies not

Table 4. Contextual success factors

Contextual success factor	Success strategy	Examples from case studies	Main contribution to success
Social structures	Leverage strong local networks for participatory governance	Scotland & Italy–Community gardens benefit from cohesive social ties and active civic culture	Enhances inclusion, adaptability, and a sense of place
	Address social fragmentation through targeted engagement and facilitation	Bulgarian social farms–Community conflict weakens participation	Social cohesion is key to stakeholder trust and sustainability
	Include marginalized groups to promote equity and social justice	Bulgarian social farms–Focus on vulnerable groups through community partnerships	Builds legitimacy and deepens social impact
Policies	Align with integrated urban agriculture policies for institutional legitimacy	Italy & Belgium–Strong policy frameworks support funding, partnerships, innovation	Enables scalability and long-term viability
	Adapt to weak or fragmented policy by building informal governance capacity	Greece & Bulgaria–Initiatives rely on grassroots innovation due to policy gaps	Grassroots adaptability offsets lack of institutional support
Economic conditions	Tailor governance to local economic realities	Italian urban farms–Combine economic viability with local market relevance	Balances financial sustainability with place-based relevance
	Use hybrid models to cope with limited resources and land insecurity	Bulgarian social farms–Combine formal and informal arrangements for efficiency	Optimizes scarce resources through flexible governance
	Sustain operations through volunteerism and non-monetary contributions	Scotland & Italy Community gardens–Operate with low funding, relying on shared labour and tools	Enables continuity in low-resource environments

only grant legitimacy to initiatives but also foster productive partnerships with public authorities, enhancing governance capacity and project scalability. In contrast, fragmented or absent policies, as observed in parts of Greece and Bulgaria, force UPA initiatives to rely on grassroots efforts and informal networks. While grassroots approaches can promote resilience, they often face challenges in scalability and long-term sustainability. Consequently, the alignment between governance models and supportive policy frameworks becomes crucial for achieving the intended UPA outcomes.

Social structures also play a central role in shaping the inclusivity and adaptability of governance practices. In settings with strong social networks, such as community gardens in Scotland and Italy, participatory governance models emerge as effective strategies for addressing local needs and ensuring inclusivity. These networks ground UPA initiatives in the unique cultural and social dynamics of their contexts, fostering a sense of place and addressing specific local challenges. By contrast, fragmented social structures or community conflicts, as observed in some Bulgarian cases, can undermine stakeholder engagement, reducing both inclusivity and equity. The inclusion of marginalized groups in UPA initiatives, such as social farms, exemplifies governance practices rooted in values of equity and social justice, demonstrating how cohesive social structures contribute to meaningful and inclusive outcomes.

Economic conditions further shape governance practices in UPA. Governance models, such as those in Italian urban farms, rely on favourable market conditions to balance economic sustainability with local relevance. However, in economically constrained settings like social farms in Bulgaria, initiatives have to adopt hybrid governance approaches. These combine formal partnerships with informal practices to optimize resource efficiency, compensating for limited funding and unstable land tenure. Similarly, community gardens, often sustained by volunteer networks and non-monetized contributions, are shaped by local socio-economic realities. This underscores the importance of tailoring governance practices to specific economic contexts to ensure operational viability and sustainability (Table 4).

5.3. Barriers to Effective Implementation: Structural, Cultural, and Economic Challenges

UPA initiatives hold immense potential for fostering innovation, sustainability, and place-sensitivity. However, barriers often arise at various stages of development. Administrative hurdles, such as high transaction costs and complex approval processes, create significant challenges by making compliance resource-intensive. Socio-cultural barriers, including limited public awareness of the benefits of UPA, further stifle the adoption of innovative agricultural practices and technologies. Such obstacles limit the ability of UPA initiatives to fully realize their innovative potential.

Hybrid governance models, which blend grassroots volunteer efforts with material and institutional support, have proven effective in addressing these challenges. Leaders with strong interpersonal and political navigation skills also play a critical role in fostering innovation by engaging stakeholders, resolving conflicts, and forming strategic partnerships.

The sustainability of UPA initiatives is similarly constrained by economic and environmental challenges. Limited funding, resource access difficulties, and unpredictable weather patterns are significant obstacles to long-term development. However, structured decision-making processes that provide transparency and stability, combined with informal and democratic approaches that build trust and solidarity, are critical for resilience. Effective leadership and the ability to establish external support networks further ensure that initiatives remain adaptable to evolving conditions. A long-term vision and capacity for adaptation are thus fundamental to the sustainability of UPA projects.

Place-sensitivity, another essential component of UPA development, presents its own challenges. Many initiatives struggle with a lack of alignment between top-down projects and community needs. This disconnect often leads to reduced community support and participation, ultimately limiting the impact of UPA efforts. Enhancing place-sensitivity requires involving local residents in decision-making and project implementation, fostering community ownership and ensuring relevance to local contexts. Additionally, raising awareness and securing policy support are vital for creating an environment where place-sensitive initiatives can thrive. Sharing successful examples and facilitating knowledge exchange can inspire public authorities and community members to embrace the potential of UPA, thus enabling more tailored and effective implementations.

5.4. Contribution to Existing Research

The findings of this article build on and contribute to the existing body of literature on UPA, particularly by addressing governance models and their implications for sustainability, innovation, and place-sensitivity. They highlight the pivotal role of governance structures in shaping UPA outcomes, confirming insights from Lohrberg et al. (2016) and Cassatella et al. (2020). Participatory and hybrid governance models foster adaptability and community engagement, aligning with the emphasis of Jansen et al. (2006) on inclusive urban management. This study extends prior research by illustrating how formal institutions and grassroots actors interact within hybrid models to promote resource-sharing and long-term viability.

The study also emphasizes the critical role of local policy environments. While supportive policies enhance top-down governance, grassroots engagement often compensates for weaker institutional frameworks. This finding expands on the work of McClintock et al. (2021). Hybrid governance emerges as a key enabler of innovation, facilitating collaboration among diverse stakeholders such as policymakers, entrepreneurs, and community groups (Specht et al., 2014; Thomaier et al., 2017). Furthermore, the contributions of UPA to social and environmental innovations, such as addressing food security and social inclusion, reinforce the arguments of Mok et al. (2014) and Orsini (2020) for context-sensitive approaches.

Place-sensitive governance, prioritizing local engagement, cultural considerations, and tailored solutions, is shown to foster higher levels of social cohesion and ownership, building on Prové (2018) and Jansma et al. (2024). Governance models that emphasize local engagement, cultural considerations, and tailored solutions to urban challenges foster greater social cohesion and community ownership. These findings support existing research on the contextual nature of UPA success (Lovell, 2011) while providing concrete examples of how governance frameworks can either enable or hinder place-sensitive practices. This study also highlights the complementary role of informal networks, particularly in contexts lacking formal support systems, extending earlier findings by Lohrberg et al. (2016). Crucially, while context is significant, it should not be a barrier to UPA development. Community engagement and strong, committed leadership remain the foundation of every initiative, regardless of external conditions.

By situating these findings within the broader scientific discourse, this article deepens the understanding of UPA governance. It confirms existing theories on participatory and hybrid governance while broadening the discussion to include themes such as informal networks and the critical adaptability of governance through leadership and community involvement. The paper has also demonstrated that there is no single best governance model that brings desired outcomes to urban and peri-urban areas. Instead, diverse, adapted, and flexible governance models can be applied, depending on the goals of the initiative (for-profit or not-for-profit oriented) and the commitment level of the various actors.

6. Conclusion

Our findings emphasize the need for UPA initiatives to be supported by robust governance structures deeply rooted in local contexts to ensure their longevity and the achievement of desired outcomes able to address urban challenges. Regardless of their type or location, UPA initiatives offer innovative, place-sensitive, and sustainable solutions. Supportive policy environments, such as those in various cities in Italy, Belgium, the UK, Denmark and Norway provide institutional frameworks and resources that foster sustainability and innovation. In contrast, fragmented or absent policies, as seen in cities in Greece and Bulgaria, force initiatives to rely on grassroots-driven governance. This underscores the importance of tailoring governance approaches to local contexts. For example, strong community networks and social cohesion, as demonstrated in the United Kingdom and Italy, support participatory governance practices, while areas with social fragmentation, like Portugal and Bulgaria, benefit from more targeted top-down approaches. The findings provide actionable insights for policymakers, practitioners, and researchers seeking to enhance the sustainability, innovativeness, and place-sensitivity of urban agricultural initiatives.

This study further underscores the critical role of governance adaptability through committed leadership and strong community engagement in the success of UPA initiatives across diverse settings and settlements. Governance models must be adapted to local socio-economic, cultural, and policy conditions. Participatory approaches thrive in cohesive communities by engaging residents in decision-making, while fragmented settings often require stronger institutional support. Hybrid governance models that blend grassroots energy with institutional resources have proven particularly effective, fostering innovation, inclusivity, and sustainability by balancing local ideas with access to necessary resources.

Leadership and strategic partnerships are also essential for the success of UPA initiatives. Visionary leaders who build collaborative networks and navigate complex policy landscapes ensure that initiatives remain adaptable and resilient over time. Inclusive practices, such as sharing resources and incorporating local knowledge, strengthen community bonds and align initiatives with local needs, enhancing both place-sensitivity and equity.

Despite their potential, UPA initiatives face challenges such as limited resources, administrative complexities, and weak policy support. Those who rely on temporarily limited funding projects suffer long-term financial uncertainty. Innovative funding mechanisms and cohesive policy frameworks are vital for overcoming these barriers. By addressing these challenges and leveraging governance adaptability, UPA initiatives can deliver sustainable, innovative, and context-sensitive solutions to urban challenges.

While contextual factors such as policies, cultural values, and socio-economic conditions provide a critical foundation for the success of UPA initiatives, our findings emphasize that they do not necessarily determine outcomes. The adaptability of governance practices to local conditions plays the most pivotal role in driving success. Regardless of whether the context is supportive or fragmented, UPA initiatives can overcome challenges through responsive governance, strong leadership, and innovative approaches. This adaptability ensures that even in less favourable conditions, such as weak policy environments or social fragmentation, initiatives can still achieve sustainability, place-sensitivity, and innovation. The ability of governance structures to influence and navigate local contexts reaffirms that, while context matters, a non-UPA supportive environment is not necessarily a barrier to the development and success of UPA initiatives. This highlights the transformative potential of UPA governance to not only adapt to but also shape challenging contexts, proving that with responsive and innovative approaches even the most difficult environments can become fertile ground for sustainable and impactful UPA initiatives.

The findings affirm that governance models in UPA are not rigidly tied to spatial or geographical determinants, but are instead shaped by adaptable interactions between institutional settings, cultural norms, and leadership practices. This confirms the broader applicability of successful governance models beyond their original settings. By focusing on adaptable, hybrid approaches that combine grassroots participation with institutional support, UPA initiatives can be tailored to diverse local contexts. This place-sensitive yet non-place-determined logic strengthens the case for policy learning and knowledge transfer across cities, enabling more inclusive and resilient urban food systems.

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Planlama 2025;Supp(1):106–122 | doi: 10.14744/planlama.2024.91129

REVIEW / DERLEME

Spatial Planning in the Transition of Food Systems: A Systematic Literature Review

Gıda Sistemleri Dönüşümünde Mekânsal Planlama: Sistematik Bir Literatür İncelemesi

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ABSTRACT

Recent declines in urban environments' resilience and sustainability capacities have initiated discussions on food systems within the literature on spatial planning. Integrating food-related considerations into the planning discipline has become increasingly important, aligning with its broader goals of fostering healthy communities and sustainable and liveable settlements. Planning tools, which serve as fundamental components of planning practices, hold significant potential to facilitate the transition towards sustainable and resilient food systems. This research aims to elucidate insights from the scientific literature on integrating food systems into spatial planning. The present study follows a systematic literature review based on the PRISMA protocol. Within this framework, descriptive (by year, subject area, research approach, and cross-cutting policy) and content analyses (by scale, space interface, food system component, spatial visibility of food, planning instrument, cross-cutting policy) were conducted on 157 papers. Mendeley, Maxqda, and VOSviewer analytical tools were used in the research. Findings reveal that integrating food systems into spatial planning requires diverse tools and approaches for reflecting the variability of planning systems and local contexts. This diversity suggests that no single approach is universally applicable. However, two key discussions for improving planning tools emerge: first, recognizing food production as a legitimate land use category to ensure its spatial allocation and continuity; second, addressing persistent practical challenges through systemic changes informed by the analysed studies. As a pioneering bibliometric analysis on integrating food systems into spatial planning, this research aspires to serve as a guiding content for future studies.

Keywords: Content analysis; descriptive analysis; food systems; spatial planning; systematic literature review.

ÖZ

Kentsel çevrelerin dayanıklılık ve sürdürülebilirlik kapasitelerinin azalması, mekânsal planlamada gıda sistemlerine ilişkin tartışmaları başlatmıştır. Gıdanın planlama disiplinine entegre edilmesi; sağlıklı topluluklar, sürdürülebilir ve yaşanabilir yerleşimlerin teşvik edilmesi hedefleriyle giderek daha önemli hale gelmiştir. Planlama uygulamalarının temel bileşenleri olan planlama araçları, sürdürülebilir ve dayanıklı gıda sistemlerine geçişi kolaylaştırma potansiyeline sahiptir. Bu araştırma, gıda sistemlerinin mekânsal planlamaya entegrasyonuna yönelik literatürden elde edilen bulguları açıklığa kavuşturmayı amaçlamaktadır. Çalışma, PRISMA protokolüne dayalı sistematik bir literatür incelemesini takip etmektedir. Bu kapsamda, betimsel analiz (yıl, bilimsel konu alanı, araştırma yaklaşımı ve araştırma çıktıları) ve içerik analizi (mekânsal ölçek, mekânsal arayüz, gıda sistemi bileşeni, gıdanın mekânsal görünürlüğü, planlama aracı, kesişen mekânsal politika) 157 makale üzerinde gerçekleştirilmiştir. Araştırmada Mendeley, Maxqda ve VOSviewer analiz araçları kullanılmıştır. Bulgular, gıda sistemlerinin mekânsal planlamaya entegrasyonunun, planlama sistemlerinin ve yerel bağlamların değişkenliğini yansıtmak için çeşitli araçlar ve yaklaşımlar gerektirdiğini ortaya koymaktadır. Bu çeşitlilik, evrensel bir yaklaşımın olmadığını göstermektedir. Bununla birlikte, iki önemli tartışma ortaya çıkmaktadır: İlk olarak, gıda üretiminin mekânsal tahsisi ve sürekliliği için meşru bir arazi kullanım kategorisi olarak tanınması gereklidir. İkincisi, incelenen çalışmaların rehberliğinde sistemik değişimlerle sürekli pratik zorlukların ele alınması önem arz etmektedir. Gıda sistemlerinin mekânsal planlamaya entegrasyonuna yönelik öncü bir bibliyometrik analiz olan bu araştırma, gelecekteki çalışmalar için yol gösterici bir içerik sunmayı hedeflemektedir.

Anahtar sözcükler: İçerik analizi; betimsel analiz; gıda sistemleri; mekânsal planlama; sistematik literatür incelemesi.

This study is based on Serim Dinç's doctoral dissertation, supervised by Prof. Dr. Azime Tezer, entitled "The Role of Food Systems in Spatial Planning: An Ecosystem Services-Based Foodshed Plan for the Istanbul Metropolitan Area".

Received: 05.10.2024 Revised: 12.12.2024
Accepted: 20.12.2024 Available online date: 18.08.2025
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TMMOB Şehir Plancıları Odası

1. Introduction

The foundation of comprehensive, forward-looking, and public interest-oriented spatial planning is rooted in the principles of liveability, sustainability, resilience, economic vitality, inclusivity, and the promotion of healthy human settlements (ECTP-CEU, n.d.; UN-Habitat, 2016). Spatial planning seeks to organise land use effectively to achieve these objectives and connect settlement systems (Wegener, 1998). Through this approach, it becomes feasible to foster liveable environments that meet the essential needs of communities. However, despite addressing housing, water, and air, food systems remain inadequately integrated into spatial planning frameworks, limiting their impact on planning theory and practice (Morgan, 2015).

Modernisation theory relegated food production to rural areas, excluding it from planning (Choguill, 1995; Mbiba, 1995). However, neoliberal policies have further marginalised food systems, linking urban food supplies to distant sources and increasing system vulnerabilities (Mason & Knowd, 2010; Schreiber et al., 2021). Today, however, this situation is changing. Recent crises such as climate change, pandemics, natural disasters and wars have highlighted these failures, intensifying concerns about urban resilience and sustainability (Cabannes & Cecilia, 2018). Consequently, food has become a more critical issue in spatial planning decision-making than ever before.

By the late 1990s, the spatial dimension of food systems within the urban environment was recognised (Pothukuchi & Kaufman, 1999), linking food to key planning concerns like transportation, land use, environment, economy, health, energy, and social justice (Morgan, 2009). As a result, it has become inevitable for food to be addressed within the planning discipline. Friedmann's (2011) view of planners as agents of systems change underscores the role of spatial planning in fostering sustainable and resilient food system transition.

Scientific research and policymakers acknowledge that food systems inherently interact with and shape spaces (Marsden & Sonnino, 2012; Sonnino, 2016; Van Haren et al., 2023). International agreements, such as the Milan Urban Food Policy Pact (MUFPP), the Sustainable Development Goals (SDGs), and the New Urban Agenda (NUA), not only support the transition towards inclusive, resilient, safe, and sustainable food systems but also explicitly call for the integration of food systems into spatial planning (MUFFP, 2015; UN, 2016; UN, 2017). However, recent studies show that this integration remains limited in both theory (Buchan et al., 2018; Morgan, 2015) and practice (Doernberg et al., 2019; Van Haren et al., 2023).

Therefore, the starting point of this research is the fact that agricultural lands are often excluded from spatial planning's theory and practice due to their legal distinction from urban areas and the exclusion of agricultural activities from urban land use plan decisions. However, planning tools, which are the fundamental indicators of planning practices, have the potential to facilitate the transition towards sustainable and resilient food systems. This research aims to highlight the insights from the scientific literature regarding the integration of food systems into spatial planning. Accordingly, the article poses two main research questions:

1. How is the relationship between spatial planning and food systems addressed in the literature?
2. Which planning tools are emphasised when integrating food systems into spatial planning?

The research methodology comprises a systematic literature review, descriptive and content analyses, utilising Mendeley, Maxqda, and VOSviewer as analytical tools.

The article is structured as follows: Section 2 outlines the methodological approach for the systematic review of the literature. Section 3 presents the results of the analyses of selected papers. Section 4 discusses the findings, and the article concludes with recommendations for future research.

2. Materials and Methods

This study aims to conduct a systematic literature review on how food systems can be integrated into the spatial planning process and which planning tools can be employed for this purpose to elucidate the transition towards sustainable and resilient food systems.

A systematic review involves a focused assessment of the literature using specific guidelines and reproducible methods to answer the research questions (Cooper et al., 2008; Grant & Booth, 2009). By systematically analysing, it allows for the mapping of certain trends as well as theoretical or practical aspects related to the research focus (Petticrew & Roberts, 2006). Additionally, it helps to identify gaps and uncertainties, thereby contributing to the development of new research areas (Zeng et al., 2022).

This study has been developed in three phases (Fig. 1). The first phase focuses on the identification of related documents in the literature, adhering to the guidelines of "Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)" (Moher et al., 2009). At the initial phase of the research databases, relevant keywords and exclusion criteria were defined. A search covering publications up to the end of 2023 identified 5,411 papers. After importing them into Mendeley and removing duplicates (n=916 sets of duplicates), the titles, keywords, and abstracts of the remaining papers were screened for relevance. Papers (n=3,164) that explored only the broader theoretical implications of food systems without discussing spatial planning, or vice versa, were deemed irrelevant to this study's focus on their integration. This pro-

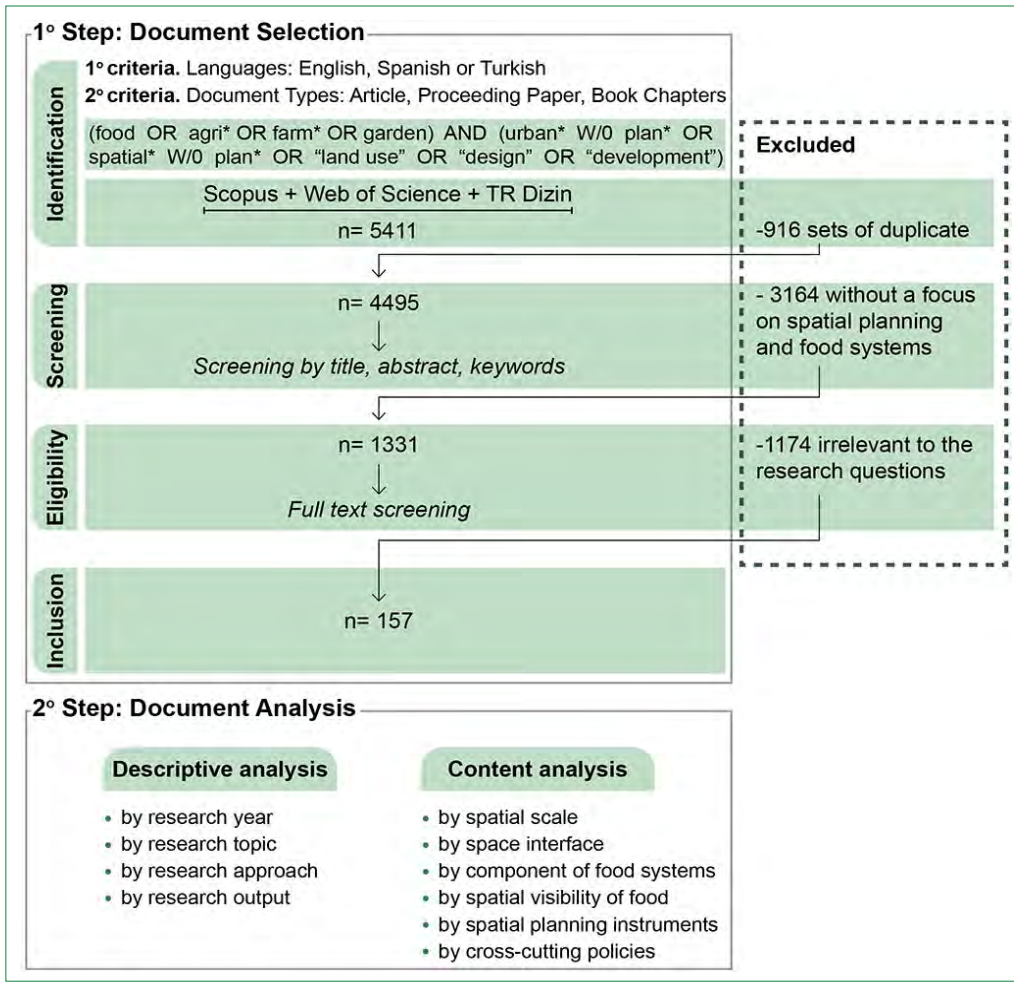

Figure 1. Methodological framework of review process (based on the PRISMA flow diagram).

cess resulted in 1,331 papers. Following a full-text review, an additional 1,174 papers were excluded due to their lack of relevance to the research questions. As a consequence, 157 papers were included in the research.

The second phase involved descriptive and content analyses of the 157 papers in Maxqda. The categorisation in Maxqda was derived based on the thematic alignment with the research questions, ensuring that the chosen categories effectively represented spatial planning dimensions and food systems components. This approach facilitated a systematic examination of recurring themes and trends across the dataset. The last phase, synthesising findings, derived insights related to the research questions.

3. Results

The findings have been examined through two main analytical perspectives. As shown in Figure 1, the descriptive and content analyses focus on cataloguing and summarising the findings related to the research questions without engaging in critical evaluation.

3.1. Descriptive Analysis

This analysis considered the distribution of the papers over time and across topics, approaches and outputs. Descriptive statistics have been used to observe publication trends and provide a regular overview of the publication ecosystem without engaging in critical analysis or evaluation.

3.1.1. Research Year

The earliest relevant paper dates back to 1982, however most publications have emerged after 2011, reflecting the growing interest in integrating food systems into spatial planning. As shown in Figure 2, although the low number of publications in 2023 does not render the sample statistically significant, there are notable increases in publications in 2017, likely due to the release of the SDGs and the NUA, and in 2022, likely due to the effects of COVID-19. Despite fluctuations, the overall trend indicates increasing attention to the research subject. However, it should be noted that the research subject constitutes only a small fraction of the broader field of "food systems" and "spatial planning."

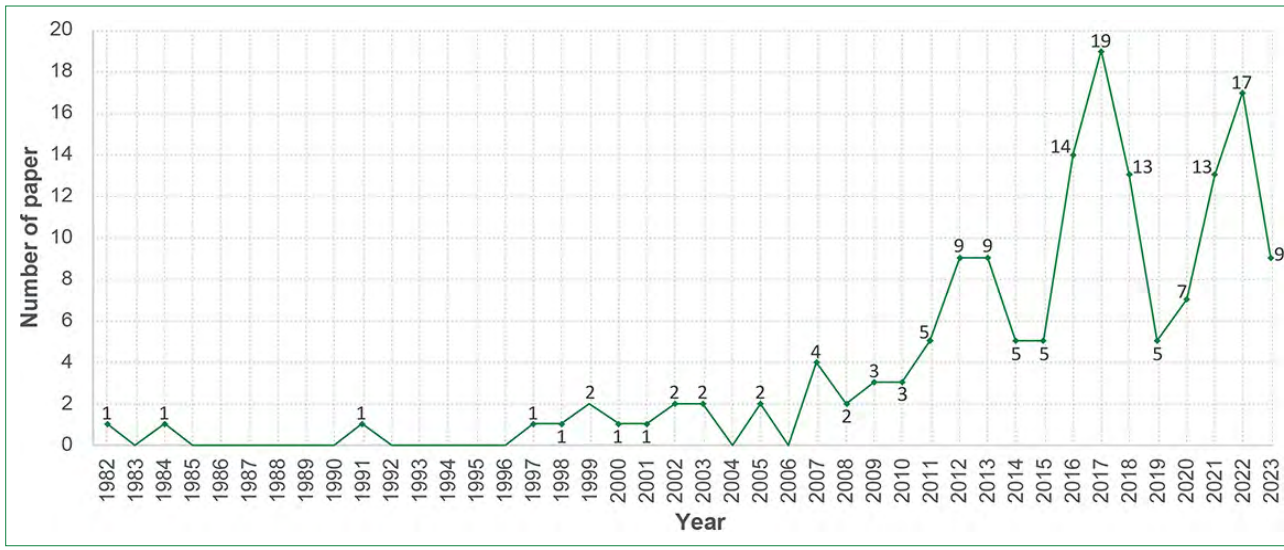

Figure 2. Analysis of publication year.

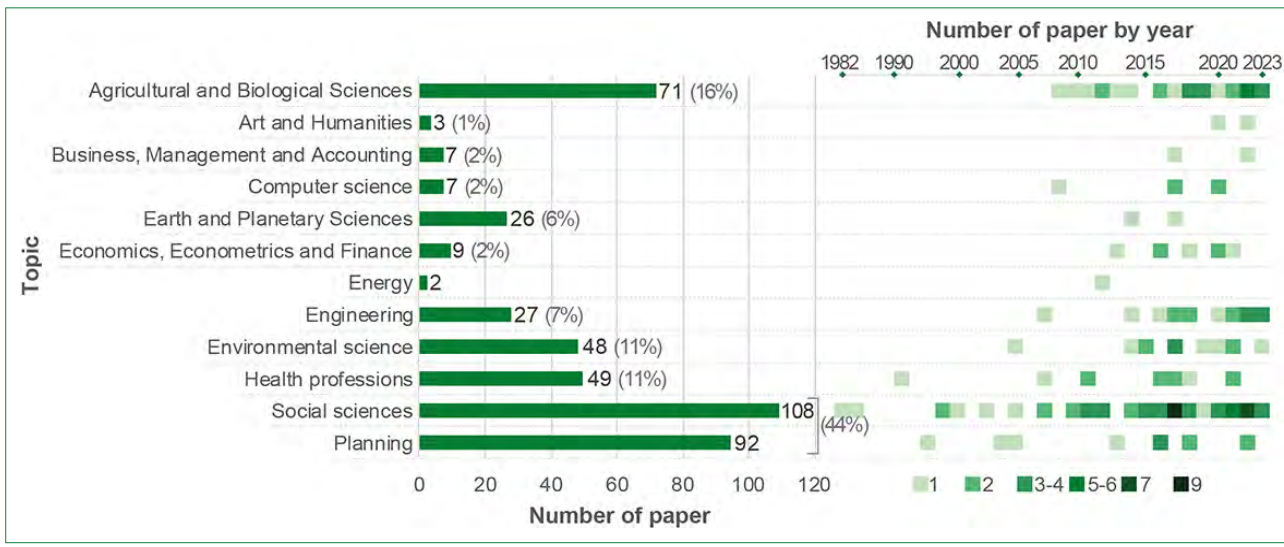

Figure 3. Analysis of research topic.

3.1.2. Research Topic

Research topic of the relevant literature shown in Figure 3 are classified according to the categories listed on Scimago Journal & Country Rank. Due to the scientific field of this research, planning is highlighted separately. According to this distribution, the majority of the research falls within the Social Sciences (including Planning), followed by Agricultural and Biological Sciences, Environmental Sciences, and Health Sciences.

Since 2015, interdisciplinary collaboration has increased, integrating planning with various disciplines to explore spatial forms that promote food access, security, and healthy nutrition, reflecting a synthesis of ideas and concepts across disciplines.

3.1.3. Research Approach

The practical approach focused on case studies is the most common research approach (Fig. 4). This trend supports Aubry et al. (2012)'s suggestion that integrating food systems into spatial planning is more about political will, sufficient information, and methods than global land scarcity in urban and peri-urban areas, emphasising the importance of practical research. This focus on case studies may also reflect the relatively new nature of the research subject, where policy and practice often precede or develop simultaneously with theory (Oulu, 2015). While practical approaches have been observed annually from 1982 to 2023, theoretical approaches have gained traction in urban planning and design after 2010, with concepts like Agricultural Urbanism (de La Salle & Hollanda, 2010), Food Urbanism (Verzone, 2012), Agrarian Urbanism (Waldheim, 2018),

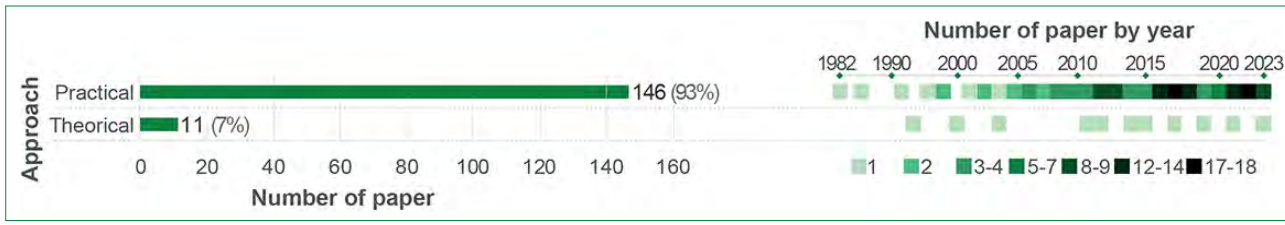

Figure 4. Analysis of research approach.

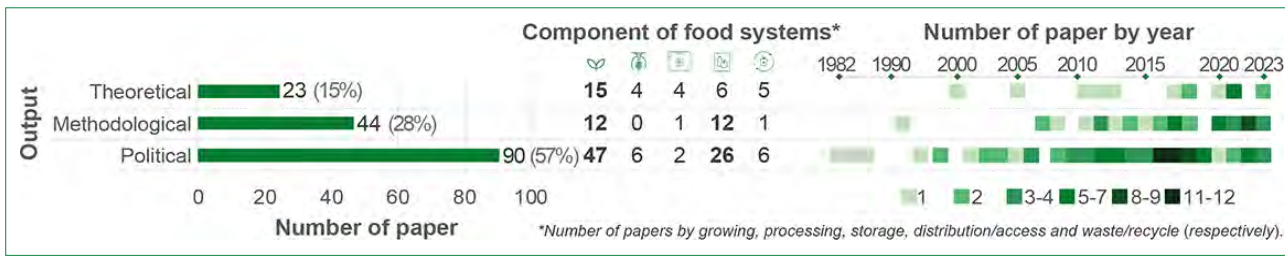

Figure 5. Analysis of research output.

and Agroecological Urbanism (Tornaghi & Dehaene 2020) emerging as examples of food-based planning theories.

3.1.4. Research Output

Figure 5 indicates that the majority of the studies contribute to policy development (Gasperi et al., 2016; Sietchiping et al., 2014), particularly strategies prioritising food production in spatial planning. Secondly, studies focusing on the development or integration of methodologies are also prominent. These methodologies also function as planning analysis&tools, guiding the development and management of food systems from an urban/regional development perspective. Methodological contributions can be classified as the analysis of current state (Tóth & Timpe, 2017), site selection (Klebl et al., 2022; Rogers et al., 2016), and scenario analysis (Tobias & Price, 2020; Zullo et al., 2023). Finally, studies contributing to theory development (Jansma & Wertheim-Heck, 2021) involve advancing existing theories within the specific research context or integrating theories from different scientific fields into the research subject. These ratios also confirm the development process of the emerging research area.

3.1.5. Co-occurrence of Keywords

VOSviewer was used to analyse the co-occurrence of keywords in the studies. Out of 536 keywords, 59 appeared two or more times. Keywords such as "urban agriculture," "urban planning," and "sustainability" have larger node sizes and higher values based on the connection strength calculated by the software. In contrast, keywords like "public space," "shrinking cities," and "food planning," which are located farther from the centre, represent relatively small research areas (Fig. 6a).

When examining the evolution of keywords (Fig. 6b), terms such as "sustainability," "food security," "policy," and "peri-urban agriculture" represent the early stages of research. Keywords emerging between 2018 and 2020 indicate a more intensive focus on food at the urban scale, with terms like "urban," "city," and "urban ecosystems." Keywords such as "urban regeneration," "shrinking cities," and "smart city" also suggest a connection between food and urban concepts. Additionally, there has been an increase in studies on food production locations, indicated by the emergence of keywords such as "community garden," "public space," "urban horticulture," and "urban fringe." The keyword "ecosystem services (ESs)" has recently emerged with high frequency, highlighting the significant interest in this subject in a short period. Keywords appearing from 2022 to the present also support ESs, including terms like "urban metabolism" and "nature-based solutions."

3.2. Content Analysis

This analysis considered the distribution of the papers in terms of relationships between space, food systems, and policy/planning. In the context of the research questions, it enhances the understanding of the scope of the literature, presenting a broad picture of its current state. Additionally, by systematically organising a large body of empirical and research evidence, it helps to identify trends and gaps for future research.

3.2.1. Spatial Scale

Food systems are integrated into spatial planning across various scales. This analysis indicates that urban-scale studies dominate, reflecting cities' key role in sustainable local food systems (Fig. 7). However, it is important to note that the dominance of urban-scale studies may stem from the inherent focus of urban planning as a discipline, which often prioritises urban areas over rural areas. Studies in metropolitan-scale—where land allocation among different uses is predominantly influenced by market dynamics—focus

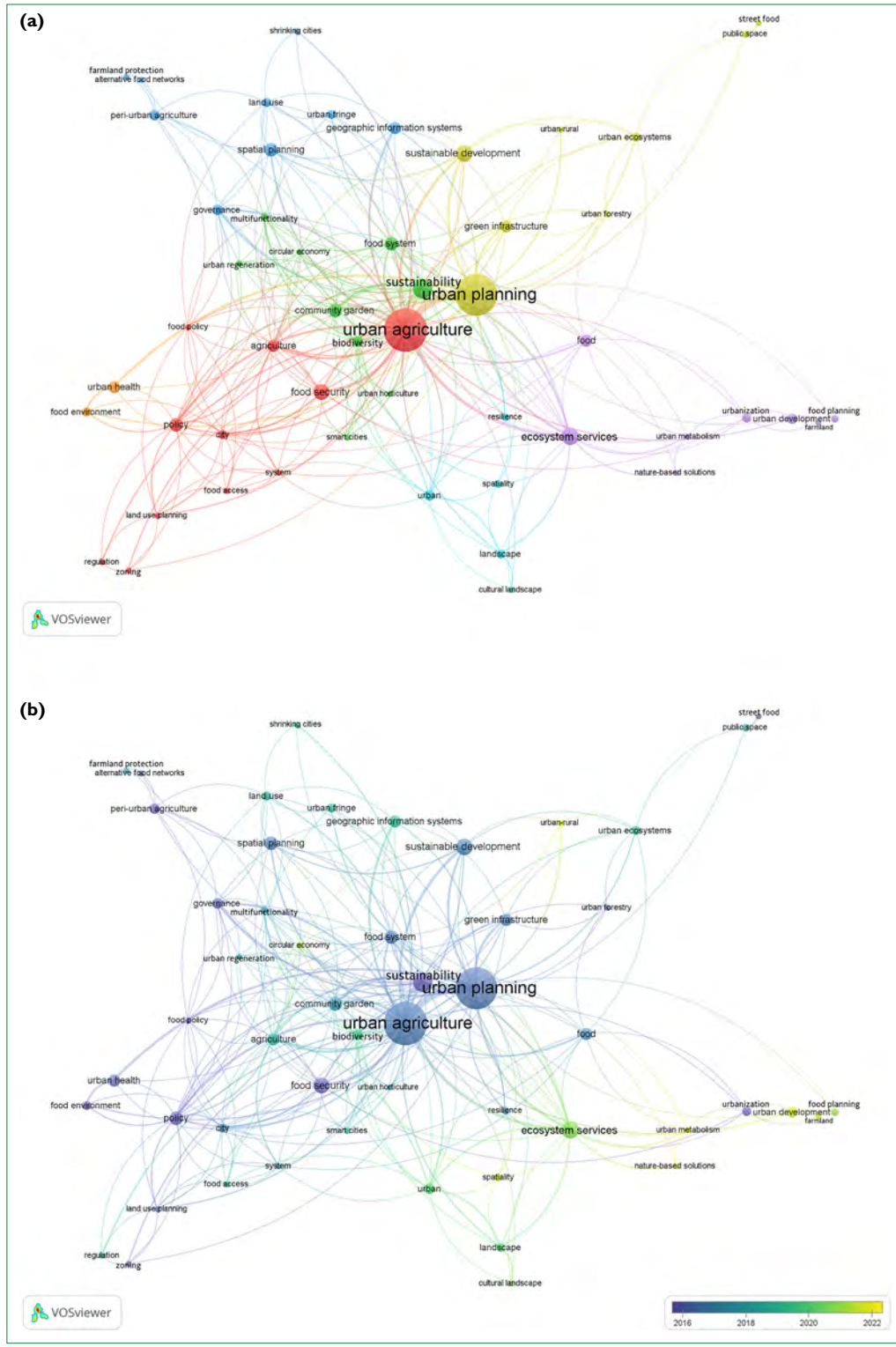

Figure 6. (a) The co-occurrence network for 59 keywords; **(b)** time-zone visualisation.

on enhancing local production and short food supply chains (Oliveira, 2022). Agriculture in metropolitan areas differs significantly from its non-urban counterpart, adapting more to urban pressures. Located in large metropolitan contexts, these areas gain greater importance due to the larger population they serve. Therefore, food systems should be incorporated into broader metropolitan or regional programmes (La Rosa, 2023). In neighbourhood-scale studies, permanent inte-

Figure 7. Analysis of scale.

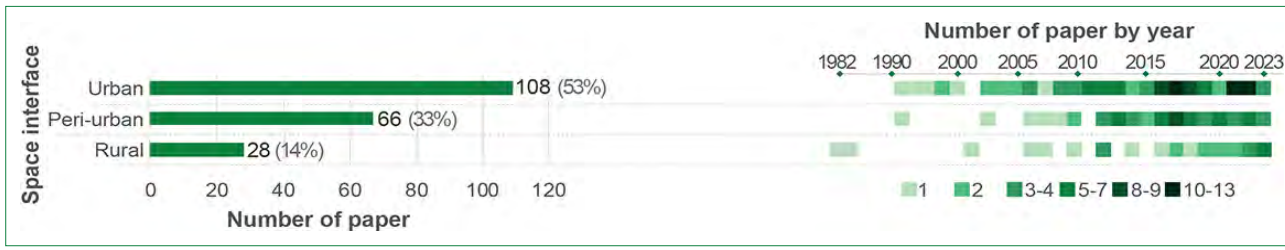

Figure 8. Analysis of space interface.

gration of growing areas into the urban texture is emphasised (Dubbeling et al., 2009). In terms of food access, restaurants, caterings (Zhang et al., 2022), and food hubs (Klebl et al., 2022) are considered as vital, for enhancing spatial vitality and quality of life. Additionally, it is observed that solutions are proposed through urban design components at both the neighbourhood and urban scales. For instance, De la Salle (2019) and Zhang et al. (2022) examine food systems from an urban design perspective, linking productive landscapes and food access spaces to streetscapes and public squares.

Dezio and Paris (2023) emphasise the need for integrated policies addressing production and agro-ecosystems at the regional level, though this scale remains underexplored. National and inter-scalar studies are represented equally. National-scale studies (Eraslan, 2023; Zhang et al., 2011) often focus on legal-administrative frameworks, while holistic approaches (Jakobsson & Dewaelheyns, 2018; Lovell, 2010) explore the interconnections across different scales.

3.2.2. Space Interface

Food systems establish themselves in highly urbanised areas, urban peripheries, and rural regions. Compared to other forms of agriculture, urban agriculture is spatially and functionally integrated into the urban systems (Tóth & Timpe, 2017). Therefore, as shown in Figure 8, urban areas are the most studied. The urban periphery is increasingly being considered as a space for planning and design experiments with the function of agricultural production (Basso et al., 2022). Studies focused on rural areas address agricultural lands as a form of land use (Westphal, 2001; Wheeler & Thompson, 2010) or explore the urban-rural links (Borelli et al., 2018; Dezio & Paris, 2023). However, it should not be overlooked that these studies approach the agricultural lands from a broader perspective, focusing on regional or metropolitan scales rather than specifically addressing rural settlement units.

3.2.3. Component of Food Systems

Food systems encompass all elements and activities related to the production and consumption of food products derived from agriculture, forestry, fishing or other (FAO, 2018; OECD, n.d.). In this context, production, processing, storage, distribution/access, and waste/recycling have been classified as spatialized components of food systems. Production is the most studied component (Fig. 9), reflecting the focus on repositioning it for urban supply (Mkwela, 2013; Zazo-Moratalla et al., 2023) and its shift toward multi-functionality for future sustainability and resilience (Jakobsson & Dewaelheyns, 2018). Most articles on specific production types focus on agri-food (Fig. 10), especially fruit and vegetables, for their high returns (Bohn et al., 2012). Following this, livestock farming, niche methods and traditional production are also addressed.

Studies that examined the distribution/access, focus on logistics (Cretella & Buenger, 2016; Marat-Mendes, 2022) or the location of physical spaces (Iñiguez-Gallardo et al., 2022; Murphy et al., 2016). The other components are addressed equally, covering topics such as the food industry for processing (Abouelfadl et al., 2014; Yang et al., 2016); cold storage as a supporting infrastructure for the food flow between pro-

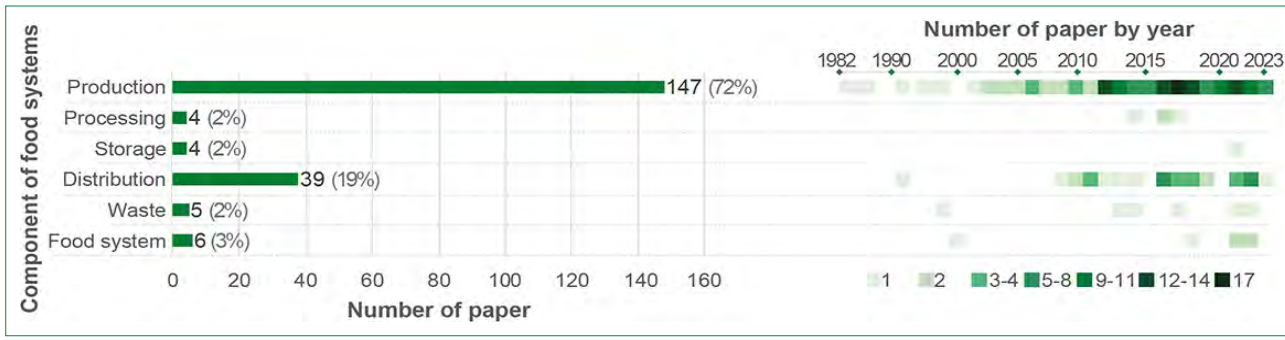

Figure 9. Analysis of components of food systems.

duction and distribution (Klebl et al., 2022; Mayrhofer, 2021); and the management of food waste and losses occurring at various steps of the supply chain (Asomani-Boateng & Haight, 1999; Steenkamp et al., 2021). Some studies, acknowledging the interdependent nature of the different stages of the food systems, have adopted an integrated approach that considers all components (Marat-Mendes et al., 2021b).

3.2.4. Spatial Visibility of Food

Each component of food systems occupies different spatial settings based on varied land uses (Fig. 11). (Peri-)Urban agriculture areas are designated for food production, planned and designed in various types, scales, and modality of tenure/usufruct depending on land use categories (La Rosa, 2023; Viljoen et al., 2015). Although some studies uniformly define (peri-) urban agriculture experiences, this diversity is evident in Figure 12. Another crucial space for production is land conservation zones, where some studies aim to protect rural agricultural lands (Kassis et al., 2021; Waegemaeker et al., 2023), while others focus on safeguarding (peri-)urban production areas from urbanisation (Baldini et al., 2022; Zazo-Moratalla et al., 2023).

The spatial organisation of food outlets profoundly impacts residents' food access (Wu et al., 2022). This is approached

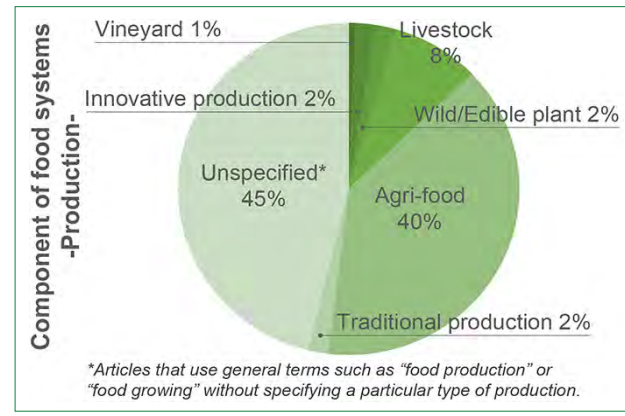

Figure 10. Detailed analysis of food production type.

in two ways: promoting food banks (Paddeu, 2017), collective kitchens (Pothukuchi & Kaufman, 2000), farmer/street markets (Ceylan & Erdoğan, 2023), and supermarkets (Wu et al., 2022) to enhance food access and security, or by restricting takeaway locations due to health concerns (White & Natelson, 2012).

Another aspect of food spatialisation includes technical infrastructure, such as transportation (Iñiguez-Gallardo et al., 2022; Marat-Mendes et al., 2021b) and wastewater systems (Raddad, 2022; Steenkamp et al., 2021). In the remaining articles,

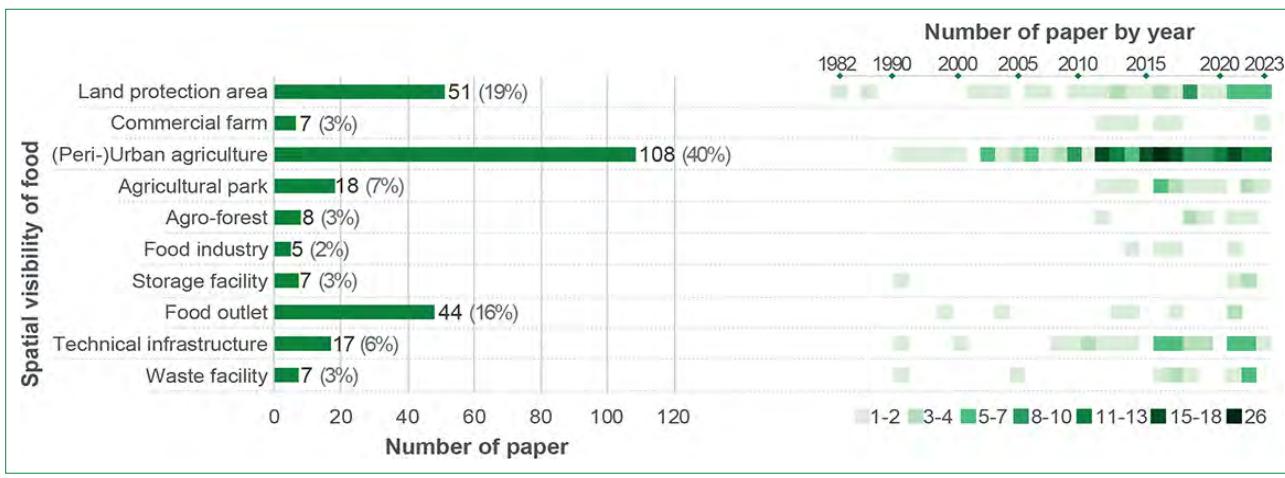

Figure 11. Analysis of spatial visibility of food.

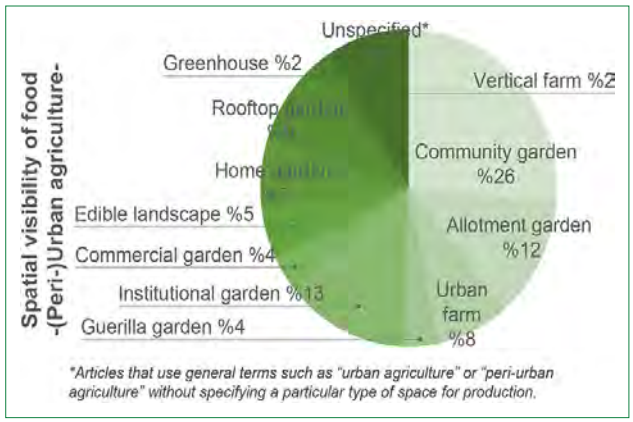

Figure 12. Detailed analysis of (peri-)urban agriculture typology.

the spatialisation related to production is carried out through agroforestry, agricultural parks, and commercial farms, while other components are positioned spatially as storage areas, processing facilities, and waste management areas.

3.2.5. Spatial Planning Instruments

Production activities are trying to find a place for themselves in the space in an unregulated manner due to planning tools that cannot go beyond protecting agricultural lands in rural areas. According to Meenar et al. (2017), this resultant policy gap has led to conflicts such as land tenure challenges (Brown & Jameton, 2000), debates on land use designations and zoning (Meenar, 2015; Thibert, 2012); and socio-legal divergence (Covert & Morales, 2014). It is acknowledged that planners and governments can support food systems' development through various planning and policy tools (Huang & Drescher, 2015). 48% of the planning tools discussed in the articles are already integrated into existing planning systems, while 52% are proposed or in development. This indicates that there is an ongoing development of new planning tools.

Planning tools are classified into five groups based on their uses. Spatial plans, the most frequently referenced (Fig. 13), aim to regulate land use and guide construction and implementation decisions (Toriro & Muziri, 2021). Under this category, master plans, zoning plans, land use plans, landscape plans, urban design plans, design guidelines, urban renewal/conservation plans, and rural plans are listed (Fig. 14). For instance, the Urban Master Plan for Barcelona prioritises ESs and agricultural land protection (Pirro & Anguelovski, 2017). The Comprehensive Master Plan of Turin introduced a new land use definition, designated as "Ecological Agriculture Areas" (Forte et al., 2022). Master or urban renewal plans are utilised to regulate and preserve food outlets (White & Natelson, 2012), while urban design plans focus on creating environments that integrate street life and food (Caramaschi, 2017). Design guidelines, typically supportive documents of master plans, include design principles and standards related to food systems for public and private spaces (Bohn & Viljoen, 2012; de la Salle, 2019).

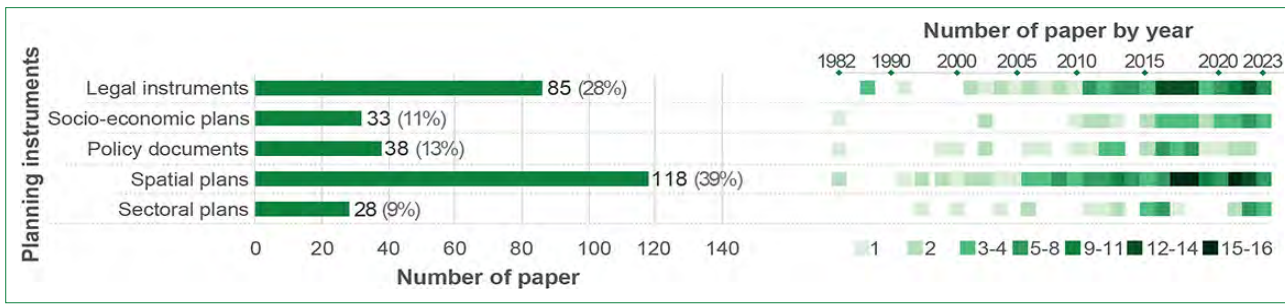

Figure 13. Analysis of spatial planning instruments.

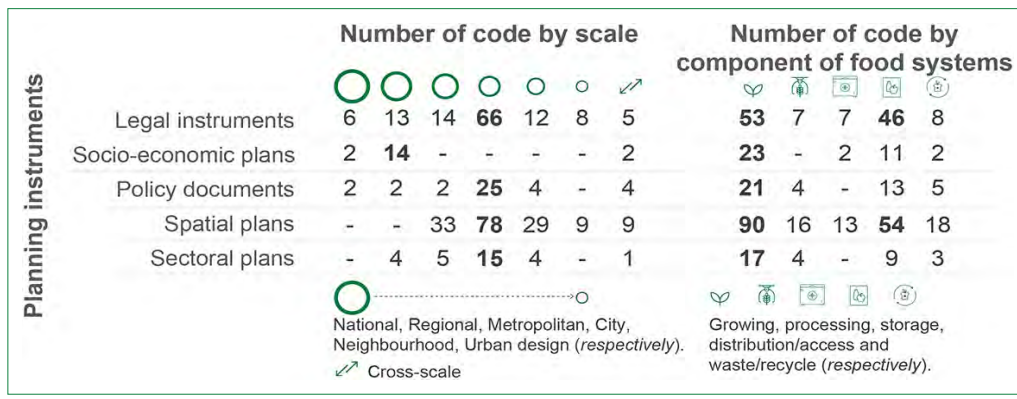

Figure 14. Analysis of relation between spatial visibility of food and scale/food components.

It is widely accepted that by-laws have the most significant impact on food systems (Miedema, 2019). Legal instruments encompass laws, regulations, and legislations, norms and standards, expropriation, transfer of development rights, land use rights, and planning permits. The articles discuss changes in the status of land parcels related to production, resulting from the revision of planning regulations.

Philadelphia's planning reform, for example, created a new urban agriculture land use category (Meenar et al., 2017). Similar regulatory updates have been made in Lisbon (Simon, 2023) and Sydney (Corkery & Osmond, 2020). Other noteworthy regulations include France's PAEN (the protection perimeter of peri-urban agricultural and natural areas) procedure, which secures non-urbanized lands for food systems (Kassis et al., 2021), and Switzerland's agricultural land protection programme (Tobias & Price, 2020).

Norms and standards within regulations also play a role in shaping food systems. For example, Bologna includes urban agriculture as an urban standard in renewal projects (Forte et al., 2022), while Cleveland ensures community garden access within walking distance (Coppola, 2018). In England, "takeaway management zones" restrict the proximity of new takeaways to educational institutions (White & Natelson, 2012). Food systems connect to "Public Outdoor Recreational Standards" designed to meet urban recreation needs (Wadumestrige Dona et al., 2022). Long-term land access is crucial for producers. Planners can address land ownership using existing tools like land banks, transfer of development rights, or conservation easements, or by developing new ones (Meenar et al., 2017; Rose, 1984; Wang et al., 2023).

Policy documents offer opportunities to incorporate production areas into urban development zones, especially in developing countries, while supporting the reorganisation of productive areas in developed regions (Viljoen et al., 2015). Policy documents include the planning frameworks and planning, land, rural, and food policies. Rotterdam's policy document, called "Food and the City Agenda", promotes urban agriculture (Cretella & Buenger, 2016). Milan uses urban renewal policies to implement urban gardens (Forte et al., 2022). Policy documents are also effective in protecting local food outlets (White & Natelson, 2012). As shown in Figure 14, policy documents are concentrated at the urban scale. At the national level, the English Planning Policy Statement addresses rural sustainability (White & Natelson, 2012).

Socio-economic plans include national and regional strategies and frameworks, spatial development frameworks, land management plans, regional plans, and rural development plans. China's national farmland protection system focuses on agricultural land management through land use control, integrated with regional zoning to optimise production, living and ecological areas (Wang et al., 2023). In Cape Town, the Provincial Spatial Development Framework incorporates food-sensitive planning principles and guidelines for regional development (Battersby, 2017). A regional renewal plan emphasising agriculture and local supply chains as catalysts for revitalising marginal areas is proposed by Dezio and Paris (2023).

Sectoral plans are the least discussed planning tools, typically focusing on transportation, green spaces, and waste management. Plans integrating production areas into green spaces are common, such as Turin's Green Infrastructure Plan emphasising urban agriculture (Forte et al., 2022). In transportation, sectoral plans often address road infrastructure for food distribution (Marat-Mendes, 2022) and public transit to enhance food access (Su et al., 2017). Cape Town, for example, has neighbourhood waste management plans targeting urban organic waste and wastewater (Steenkamp et al., 2021).

3.2.6. Cross-cutting Policies

Food systems serve as entry points for achieving development goals like ecological vitality, social justice, economic development, and public health (Battersby, 2017; Wu et al., 2022). Additionally, considering planning and food systems together represents a transition process in which the various sectoral dimensions of public policies can be integrated and reconciled in a cohesive manner (Oliveira, 2022). This analysis examines how food systems are addressed under various policy topics within spatial policies developed by governments.

The integration of food into spatial planning is central to sustainability and ecology agendas (Fig. 15). Jones and Beza (2018) argue that food planning and security should be measurable outcomes within strategic policies and legislation. Likewise, sustainable food production practices are promoted in environmental policies as tools for biodiversity conservation, ESs, agro-ecosystem resilience, and ecological connectivity (Baldini et al., 2022; Basso et al., 2022).

The second key policy topics are economy and quality of life. Since each component of food systems is an economic sector, cities and regions leverage them for local economic development. Walker (2015) compares the rapidly growing Vancouver with the shrinking Detroit, highlighting how urban agriculture can contribute to economic development despite differing economic paths. Additionally, production and distribution practices address market trends such as recreation (Mélice Dias & Marat-Mendes, 2020), tourism (Yang et al., 2016), and creative industries (Cretella et al., 2016). Many policies aimed at enhancing quality of life focus on public health. Jakobsson and Dewaelheyns (2018) connect the adoption of productive gardens by cities with broader debates on green spaces and public health.

Resilience policies have been addressed within the context of climate change and natural disasters. For instance, food production areas in Vancouver neighbourhoods are asso-

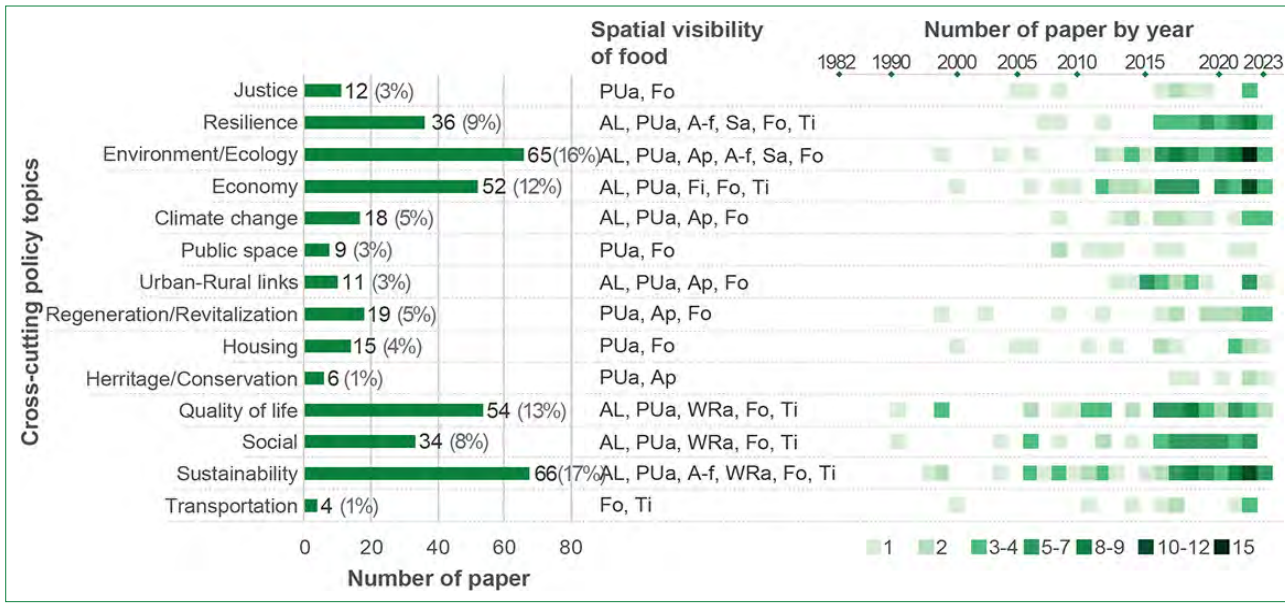

Figure 15. Analysis of cross-cutting policies.

AL: Agricultural land; PUa: (Peri-)Urban agriculture; Ap: Agricultural park; A-f: Agri-forest; Fi: Food industry; Sa: Storage area; WRa: Waste/Recycle area; Fo: Food outlet; Ti: Tecnical infrastructure.

ciated with enhancing resilience by mitigating the impacts of climate change (Roehr & Knuigh, 2009). According to Iñiguez-Gallardo et al. (2022), climate-resilient cities must ensure access to essential goods and services, such as food markets. In relation to natural disasters, the conversion of vacant lands into productive areas in New Orleans after Hurricane Katrina (Kato et al., 2016) and community gardens in Christchurch following the 2010/11 Canterbury Earthquakes (Shimpo et al., 2019) demonstrate the importance of food systems in post-disaster recovery.

Social policies aiming to create social cohesion through forms of social agriculture (Basso et al., 2022), and justice policies aiming to ensure social justice through urban agriculture visions (Pothukuchi, 2017), generally focus on disadvantaged residents.

Vacant urban lands, abandoned industrial buildings, and overlooked informal spaces, like derelict street and railway edges, present significant opportunities for spatial transformation and revitalization policies (Corkery & Osmond, 2020). Miner and Raftery (2012) advocate for productive place-making to reintegrate these areas into urban spaces. Residential areas can be addressed within transformation and housing policies to create new units. Production areas are integrated into these policies through strategies that ensure spatial diversity, permeability, and well-being (Basso et al., 2022; Dubbeling et al., 2009).

Policies aimed at mitigating the impacts of climate change are also addressed independently of the aforementioned resilience policies. For instance, in Portugal, national programmes to combat climate change include urban agriculture as a substrategy (Simon, 2023).

Future urban-rural links are expected to form a continuum rather than a relationship between separate entities (Viljoen et al., 2015). Consequently, food systems that integrate urban and rural areas are key in land management policies (Sietchiping et al., 2014). An example of heritage/conservation policy is the South Milan Agricultural Park, which serves as a conservation tool to protect rural heritage and agro-landscapes (Forte et al., 2022). While food logistics and access are closely tied to transportation policies, this connection is underexplored, as Marat-Mendes et al. (2021b) similarly note that Lisbon's transportation system lacks an integrated approach with the food systems.

4. Discussion

The analysis shows that integrating food systems into spatial planning involves various tools and approaches, reflecting the inherent diversity of planning systems and local dynamics. This diversity indicates that no single approach is universally applicable. However, two potential avenues for enhancing the effectiveness of planning tools emerge from this study, which are directly tied to the research questions. First, addressing both research questions, the production component should be reconsidered as a legitimate land use category, allowing for the spatial allocation of production activities within planning frameworks. This ensures their continuity throughout the plan's implementation. Second, in response to the second research question, it is evident that while spatial planning tools are available, practical challenges hinder their application. Drawing on the experiences from the papers analysed, these challenges are synthesised below to highlight the systemic changes required for more effective planning tools.

4.1. Food Production as a Land Use in Spatial Planning

In spatial planning, components of food systems other than production have well-defined land use classifications: industrial zones for processing and storage, logistics centres and technical infrastructure for distribution, commercial areas for markets and restaurants, and facilities for waste management. Typically, land for food production is allocated to rural areas and large agricultural parcels. However, as detailed in 3.2.4 Spatial visibility of food, production activities span diverse spatial settings, including (peri-)urban agriculture, agricultural parks, and conserved agricultural lands, but often lack formal recognition in spatial planning frameworks.

Additionally, 3.2.2 Space interface underscores the diverse spatial contexts—urban, peri-urban, and rural—in which food systems operate. It reveals that production areas in peri-urban and rural spaces are frequently neglected or undervalued in planning decisions, leading to land use conflicts and reduced agricultural continuity. To prevent loss of land access for production and ensure agricultural continuity, it is crucial to reconsider and formally integrate agriculture into spatial planning as a recognised land use decision (Gasperi et al., 2016). Integrating production into spatial planning as a distinct land use can be approached in several ways.

- One approach is to formally recognise production as a legitimate land use and prioritise it as part of urban infrastructure (Corkery & Osmond, 2020; Meenar et al., 2017). Marat-Mendes et al. (2021b) and Zazo-Moratalla et al. (2023) show that regulations defining production areas within urban contexts protect land use rights. Planning-related legislation can define the functions and typologies of food systems, establish criteria for the designation and protection of areas, and outline governance responsibilities (Morán Alonso & Fernández de Casadevante, 2014). Additionally, legends dedicated to food systems in spatial plans can help reduce urbanisation pressures and limit land consumption, as food production is seen as a major component of land use. However, Forte et al. (2022) caution that rigid functional planning may not effectively address contemporary urban needs.
- A second approach integrates food production into planning as a temporary land use, allowing adaptation to the dynamic needs of urban development. This method promotes short- or medium-term occupancy licences, rather than permanent ownership or user rights (Forte et al., 2002; Tóth & Timpe, 2017). However, this approach can create long-term uncertainty for production continuity, as it lacks provisions for land tenure security or improvement.
- The final approach combines production areas with other urban functions to promote multifunctional land use (Jansma & Wertheim-Heck, 2021). For instance, these areas could be integrated into new housing projects (Gasperi et al., 2016; Howe, 2002) or urban green spaces, supporting green infrastructure strategies like green belts or corridors (Jahr et al., 2021; Simon, 2023; Tóth & Timpe, 2017). Concepts like "Continuous Productive Urban Landscapes" (Viljoen et al., 2015) and "Edible Green Infrastructure" (Russo & Cirella, 2020) aim to integrate food production into multifunctional urban space networks. However, agriculture must be recognised as part of green infrastructure (Tóth & Timpe, 2017); otherwise, as in the Copenhagen plan (Waegemaeker et al., 2023), agricultural areas may be converted to recreational uses. This calls for a re-evaluation of green space concepts regarding production areas.

4.2. Barriers Hindering Spatial Planning Tools

3.2.5 Spatial planning instruments highlights a range of tools, such as master plans, planning laws, and socio-economic plans, which could support food systems. However, it also underscores the practical challenges of implementation, including competing land use priorities, legal complexities etc. Furthermore, as demonstrated in section 3.2.6 Cross-cutting policies, the intersection of food systems with multiple policy domains, including sustainability, development, and social equity, often leads to conflicts between priorities and the resulting inconsistencies. Thus, it is crucial to discuss both the critical issues that hinder the inclusion of production initiatives in spatial planning and the barriers that undermine the effectiveness of existing planning tools.

- One major issue is the competition for land and soil between housing, transportation, and green spaces (Pirro & Anguelovski, 2017), which threatens productive areas within urban boundaries as well as prime croplands on the urban periphery and in rural areas. Converting agricultural land into urban areas is generally less costly than redeveloping existing urban spaces or repurposing abandoned infrastructure, leading to planning decisions which favour land consumption and expansion (Martin & Marsden, 1999; Zullo et al., 2023). This trend raises concerns about food security and maintaining food self-sufficiency (Tobias & Price, 2020).
- Another challenge is the legal complexity surrounding ownership, land uses, rights, and regulations. The clear division between public and private ownership often excludes shared arrangements (Blomley, 2005). Since production activities, especially on vacant lands, often occur at the intersection of public and private properties. Thus, a hybrid form of ownership—or even a third legal category—might be needed to accommodate these informal arrangements (Corkery & Osmond, 2020).
- A third barrier is the tension between local priorities and national policy in decision-making. Local governments may find their ability to implement planning regulations constrained by higher-level authorities (Rahilly

et al., 2024), making existing planning tools ineffective. Specifically, when appeals for planning permissions are escalated to higher authorities, decision-making dynamics can shift. Additionally, inconsistencies between scale, planning tools, and timing can arise. For instance, changes in land use might occur during the gap between plan approvals by different institutions at various scales, potentially invalidating planning decisions (Pérez-Campaña & Valenzuela-Montes, 2015).

5. Conclusion

Recognising spatial planning as a fundamental step in the transition towards more sustainable and resilient food systems, this systematic review explores the level and/or way of integration of food systems into spatial planning by analysing 157 academic articles, within a representative sample of academic literature. The review clarifies the scope of existing research, highlights critical issues, and suggests future research directions. As the subject is still in its exploratory phase, there is a need for more in-depth discussion at all planning levels to develop a comprehensive process linking food systems with spatial planning. Future research should facilitate the vision of a planning system that incorporates food issues from the outset.

5.1. Limitations of the Study

Although the three most comprehensive databases were used, some important publications from other sources may have been overlooked. Additionally, considering only peer-reviewed articles may have a similar problem. Besides, even though an extensive search strategy was established for scanning, rural studies may have been excluded due to the urban focus of planning discussions. Nevertheless, using the term "spatial planning" was deemed more appropriate, as it encompasses not only urban areas but also agricultural lands that are often excluded from planning boundaries. This approach reduces the uncertainty of missing relevant studies. Lastly, although this article focuses on the implementation of food systems transitions within spatial planning, it excludes questions regarding "who implements" and "with which financial instruments" to limit its scope. Due to the multidimensional and complex nature of food systems, food governance is a research subject on its own. Despite these limitations, this study provides a comprehensive view of the relationship between food systems and spatial planning, and can be a pioneering bibliometric analysis conducted within this scope.

5.2. Looking to the Future

Research on integrating food systems into spatial planning and its tools is a nascent but evolving field. The review indicates that existing planning tools are being enriched by new proposals. Future research should at least shed light on the following aspects:

- The current focus of the researches predominantly lies in food production and urban scale. This indicates that the studies are conducted within a constrained framework. However, the complex and interdependent nature of food systems necessitates a holistic reconsideration of the issue.
- It is recognized that the scope of reconnecting cities with local food production extends far beyond the agricultural lands on the urban periphery. Policies related to food production and agro-ecosystems shape regional systems, thereby requiring an integrated approach. Hence, future research must not overlook the intermediary role of the regional scale in aligning national and local levels within visions and strategies.
- Urban policies are typically addressed at the municipal level, while agricultural and rural development policies are considered at national and regional scales. As a result, agricultural policies often fall outside the purview of sensitive spatial planning. However, given that urbanisation processes are multidimensional and multi-scalar, extending beyond city boundaries, the inclusion of rural areas in spatial planning is critical for the food systems transition.
- ESs are an emerging subject in the integration of food systems into spatial planning. Considering that food systems activities may not always be ecosystem-friendly, the inclusion of ESs provides significant support at the implementation level.
- Finally, despite some recommendations, there is still limited space for innovative tools and practices within the rigid and hierarchical structure of existing planning tools. To address this, food systems need to be reimagined through flexible planning instruments. This would foster more innovative efforts for the food systems transition in terms of rural and urban spatial planning, governance models, and integrated design approaches across scales.

Note

This dissertation is supported by The Scientific and Technological Research Council of Türkiye (TÜBİTAK).

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Planlama 2025;Supp(1):123–133 | doi: 10.14744/planlama.2025.80847

REVIEW / DERLEME

Sustainable Urban Food Production with a Special Focus on Permaculture from Hungarian Perspectives

Macar Perspektifinden Permakültüre Özel bir Odaklanma ile Sürdürülebilir Kentsel Gıda Üretimi

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ABSTRACT

In recent years, there has been a growing interest in sustainable agriculture and food production in Hungary as well. Moreover, as today's climate change significantly impacts agriculture, there is increased scrutiny of conventional agriculture, with various sustainable agriculture concepts emerging, such as climate-smart agriculture, regenerative or conservation agriculture, organic farming, permaculture, and agroforestry. This review article compares different sustainable agriculture approaches in terms of their definitions and principles based on the scientific literature, showing that urban spaces are also suitable for sustainable food production.This study aims to provide insights into the current state of environmentally sustainable agriculture in Hungary, focusing specifically on permaculture as an innovative practice that is gaining traction in the country. Permaculture represents one of the most advanced forms of sustainable farming and gardening in Hungary. It benefits from a well-developed institutional framework, as well as robust educational and training resources. Moreover, permaculture can be practiced in both rural and urban areas, making it suitable for expansion across all regions. Additionally, successful examples of sustainable agriculture in Hungary may inspire similar initiatives in other countries, thus promoting the broader adoption of climate-friendly and environmentally sustainable food production methods. The paper seeks to answer several key questions: How do Hungarian farmers define permaculture? What advantages does this farming method offer? And how can its adoption be encouraged more widely throughout the country? Hungary's experiences can serve as a valuable model for other nations aiming to foster environmentally sustainable and climate-friendly farming practices.

Keywords: Farming; Hungary; permaculture; sustainable agriculture.

ÖZ

Son yıllarda Macaristan'da da sürdürülebilir tarım ve gıda üretimine yönelik ilgi giderek artmaktadır. Ayrıca, günümüzde iklim değişikliği tarımı önemli ölçüde etkilediğinden, konvansiyonel tarıma yönelik incelemeler artmakta ve iklim-akıllı tarım, rejeneratif veya korumacı tarım, organik tarım, permakültür ve agroforestri gibi çeşitli sürdürülebilir tarım kavramları ortaya çıkmaktadır. Bu derleme makalesi, farklı sürdürülebilir tarım yaklaşımlarını tanımları ve ilkeleri açısından bilimsel literatüre dayanarak karşılaştırmakta ve kentsel alanların da sürdürülebilir gıda üretimi için uygun olduğunu göstermektedir. Bu çalışma, Macaristan'da çevresel açıdan sürdürülebilir tarımın mevcut durumu hakkında bilgi vermeyi amaçlamakta ve özellikle ülkede ilgi gören yenilikçi bir uygulama olarak permakültüre odaklanmaktadır. Permakültür, Macaristan'da sürdürülebilir tarım ve bahçeciliğin en gelişmiş biçimlerinden birini temsil etmektedir. İyi geliştirilmiş bir kurumsal çerçevenin yanı sıra sağlam eğitim ve öğretim kaynaklarından faydalanmaktadır. Dahası, permakültür hem kırsal hem de kentsel alanlarda uygulanabilir, bu da onu tüm bölgelere yayılmaya uygun hale getirir. Ayrıca, Macaristan'daki başarılı sürdürülebilir tarım örnekleri diğer ülkelerdeki benzer girişimlere ilham verebilir, böylece iklim dostu ve çevresel açıdan sürdürülebilir gıda üretim yöntemlerinin daha geniş çapta benimsenmesini teşvik edebilir. Bu çalışma birkaç temel soruya yanıt aramaktadır: Macar çiftçiler permakültürü nasıl tanımlıyor? Bu tarım yöntemi ne gibi avantajlar sunuyor? Ve ülke genelinde benimsenmesi nasıl daha yaygın bir şekilde teşvik edilebilir? Macaristan'ın deneyimleri, çevresel açıdan sürdürülebilir ve iklim dostu tarım uygulamalarını teşvik etmeyi amaçlayan diğer ülkeler için değerli bir model oluşturabilir.

Anahtar sözcükler: Çiftçilik; Macaristan; permakültür; sürdürülebilir tarım.

Received: 21.08.2024 Revised: 06.03.2025
Accepted: 07.06.2025 Available online date: 19.08.2025
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TMMOB Şehir Plancıları Odası

Introduction

The loss of biodiversity and degradation of soil, water, and ecosystems mean significant challenges for humanity. The depopulation of rural areas, health problems related to nutrition, and obstruction of access to quality and nutritious food all justify the initiation of drastic changes in the areas of food production, distribution, and consumption (Frison-IPES-Food, 2016; Wezel et al., 2018; Balázs et al., 2020, 2021). Despite this, conventional agriculture is the most common typology in developed countries. This system is large-scale, dependent on inputs (synthetic fertilizers and agroprotectants), and highly mechanized. It has historically leveraged standard soil preparation methods (e.g., ploughing followed by sowing), and the yields per unit area are maximized. Conventional farming methods are highly context-dependent, meaning they only work with their full economic potential if production inputs are low, environmental factors and the market are stable, and an income exceeding the general cost of production can be realized (Molnár & Fraser, 2020). It is worth mentioning that monoculture plays a crucial role in land degradation (Pacheco et al., 2018), which over time develops into a myriad of other environmental (e.g., reduction in land productivity, soil erosion, water quality deterioration, loss of biodiversity, dysfunctionality of ecosystems, and so on) problems. As monoculture activities continue to intensify, soil and water erosion and fertility loss will affect the quality and productivity of soil health (Crews et al., 2018; McLennon et al., 2021). All in all, many questions arise about the long-term sustainability of such an approach (Durham & Mizik, 2021) since the expansion of conventional agricultural productive techniques is producing an ecological crisis worldwide (Martínez-Castillo, 2016). Numerous studies show that the critical factors are already and will continue to face increasingly significant challenges in the future, necessitating the well-founded debate on the future of agriculture (European Environment Agency, 2023), as well as rethinking and redesigning our food production systems (Perfecto et al., 2009; Ranganathan et al., 2018).

In response to various challenges related to conventional agriculture, the Common Agricultural Policy (CAP) 2023–27 entered into force on 1 January 2023. The CAP is built around three main goals to achieve a sustainable system of agriculture in the EU: economic sustainability, environmental sustainability, and the social sustainability of farms. To meet these goals, EU countries use a wide range of targeted actions to address each country's specific needs and create CAP Strategic Plans. Through these plans, EU countries provide income support to farmers, support them in the transition towards sustainable production, and contribute towards the ambitions of the EU Green Deal, the EU's sustainable and inclusive growth strategy. The European agriculture and food system, supported by the CAP, is already a global standard in terms of safety, security of supply, nutrition, and quality. Now, it must also become the standard for sustainability (European Commission, 2024a, 2024b).

Hungary's CAP Strategic Plan (2023–2027) emphasizes the country's unique natural features contributing to favourable agricultural conditions. Since 2020, the size of Hungary's farmland has remained relatively stable, with 5.3 million hectares dedicated to agricultural cultivation. However, the number of agricultural operations has decreased by 19 percent due to ongoing consolidation in the sector. As of June 1, 2023, the inventories of cattle, swine, sheep, and turkeys were lower compared to the previous year, while the number of chickens, geese, and ducks had increased. The plant production within the country's agricultural economy continues to rise. Agriculture accounts for 4.8% of national employment, while the food industry makes up 3.2%. Hungary has approximately 430,000 farmers, around 30% of them over 64 years old. Additionally, forests cover 23% of the country's territory, and 43% of the land is protected by the Natura 2000 program (Foreign Agricultural Service, 2023).

The agri-food sector in Hungary is currently facing significant challenges, and its transformation is being driven by two key trends: digitization and ecologization, which means a more ecological approach. These trends align with the primary objectives of the Green Deal and the new Common Agricultural Policy (CAP) for the period following 2023. From a sustainability perspective, Hoyk et al. (2022a) identified five policy gaps in Hungarian strategies: (1) lack of an ecological approach, (2) climate change does not receive enough attention, (3) complex landscape management does not appear in the documents, (4) measures that increase inequalities between farmers, and (5) the Digital Food Industry Strategy does not deal with healthy food consumption and issues of food waste.

The study aims to shed light on the current situation of environmentally sustainable agriculture in Hungary, with a special focus on permaculture as an innovation that is increasingly spreading in the country. As we will see in the theoretical overview of the topic, there are many different types of sustainable agriculture. The present study focuses on permaculture because it is one of the most advanced types of sustainable farming and gardening in Hungary, with the most developed institutional framework and educational and training background, and because it can be applied not only in rural but also in urban areas so all regions can be suitable for the expansion. Good examples of sustainable agriculture in Hungary may inspire similar adaptations in other countries, thus helping to promote the wider spatial spread of climate and environmentally friendly food production. The paper tries to answer the question of how permaculture is defined

in Hungary by the farmers who practice it, what advantages this farming method offers, and how it can be more widely adopted throughout the country. Hungary's example can be a starting point for other countries to promote environmentally sustainable and climate-friendly farming.

Theoretical Framework: Agroecology and Sustainable Agriculture, with a Special Focus on Permaculture

The term "agroecology" first appeared in academic discourse in the early 20th century focused on pest management and soil biology. In the 1960s, as environmental movements gained momentum, agroecology shifted toward advocating for alternatives to industrial, chemical-intensive farming. This perspective encouraged agronomists to reconsider their practices' ecological and social impacts while promoting "natural ways of farming." Over time, agroecology expanded beyond scientific circles to become a recognized social movement emphasizing sustainability and equitable benefits in agriculture. Agroecology continued to grow as both a science and a movement throughout the 1990s, particularly as the environmental agenda gained momentum in the USA and Latin America. By the 2000s, discussions around agroecology began to emphasize the entire food system, linking production with processing, distribution, and consumption (IPES-Food, 2022).

The terms "sustainable development" and "sustainability" have also been increasingly in the public consciousness from the 1960s to the present day (Carson, 1962; Centeri et al., 2002; Martinát et al., 2016; Hoyk et al., 2022b; Hardi, 2023), and there are many discussions and dialogues about what these concepts mean and how they can be applied (Meadows, 1972; VTA, 2000; Vida, 2004). The term "sustainability" already appeared in agriculture several decades ago, and in parallel, adaptation into practice was tried to find solutions and technologies faithful to the concept (Ángyán, 1991; Gliessman, 2006; FAO, 2014; Szilágyi et al., 2018). According to the definition of Rajbhandari (2019), agriculture and rural development are sustainable when they are ecologically non-degrading, economically viable, politically non-discriminatory, socially acceptable, technologically appropriate, and based on a holistic scientific and system approach. Sustainable agriculture and rural development can be described as an initiative meant to meet the food or nutritional requirements and other needs of present and future generations, providing durable and decent employment, maintaining and enhancing the productive and regenerative capacity of the natural resource base, as well as reducing vulnerability and strengthening self-reliance of local people, particularly farming communities. Sustainable agriculture is neither linked to any particular technological practice nor an exclusive domain of organic farming (Rajbhandari, 2019).

According to Atreya et al. (2020), farming systems can be classified into four distinct types based on their inputs and sustainability. Agriculture can be categorized into four distinct types based on their sustainability practices. The first category is chemical input-based agriculture, which includes traditional and industrial methods that are generally considered unsustainable. In contrast, the second category, biological input-focused agriculture, comprises practices such as organic farming, conservation agriculture, and integrated pest management. The sustainability of these methods is seen as debatable. The third category, food system-based agriculture, encompasses practices like community-supported agriculture and ecosystem-based farming, which are regarded as more sustainable. Finally, there is nature-based agriculture, which includes techniques such as permaculture, biodynamic, bio-intensive and regenerative agriculture. This category is viewed as the most sustainable, highlighting the importance of holistic approaches to farming that prioritize environmental health and sustainability (Fig. 1).

This paper focuses on nature-based and food system- based agriculture, as permaculture also falls into this group. As there are often difficulties in interpreting the concepts, Table 1 summarizes the definitions and principles of these approaches.

The table illustrates the distinctions between various types of farming, categorized as nature-based and food-system based agriculture. This study will now focus specifically on permaculture, which has an increasing significance in Hungary. The institutional framework and organizational system supporting this approach are continually evolving in the country. Professional organizations offer training courses throughout the year, host conferences, and facilitate community knowledge-sharing events, including popular visits to permaculture gardens. Permaculture is particularly engaging for a variety of disciplines beyond agriculture and agroecology, as it influences human behavior in many aspects of daily life. It promotes a minimalist lifestyle and encourages the use of local resources, extending beyond the garden. This shift can alter consumption patterns, steering individuals and households toward greater self-sufficiency rather than excessive reliance on industrial products, ultimately resulting in a higher quality of life. Furthermore, permaculture can be applied in both urban and rural settings, across varying scales, and can shape landscapes and communities through the development of permaculture gardens and groups. Additionally, a personal connection to permaculture—through owning a permaculture garden and participating in a professional permaculture group—has motivated the choice of this research topic.

First of all, it is important to mention that permaculture is not just a farming system but also a nature-centred approach based on ethical and management principles focused on conserving the Earth and nature (Centeri et al., 2021). The concept of permaculture has been defined in various ways. Bill

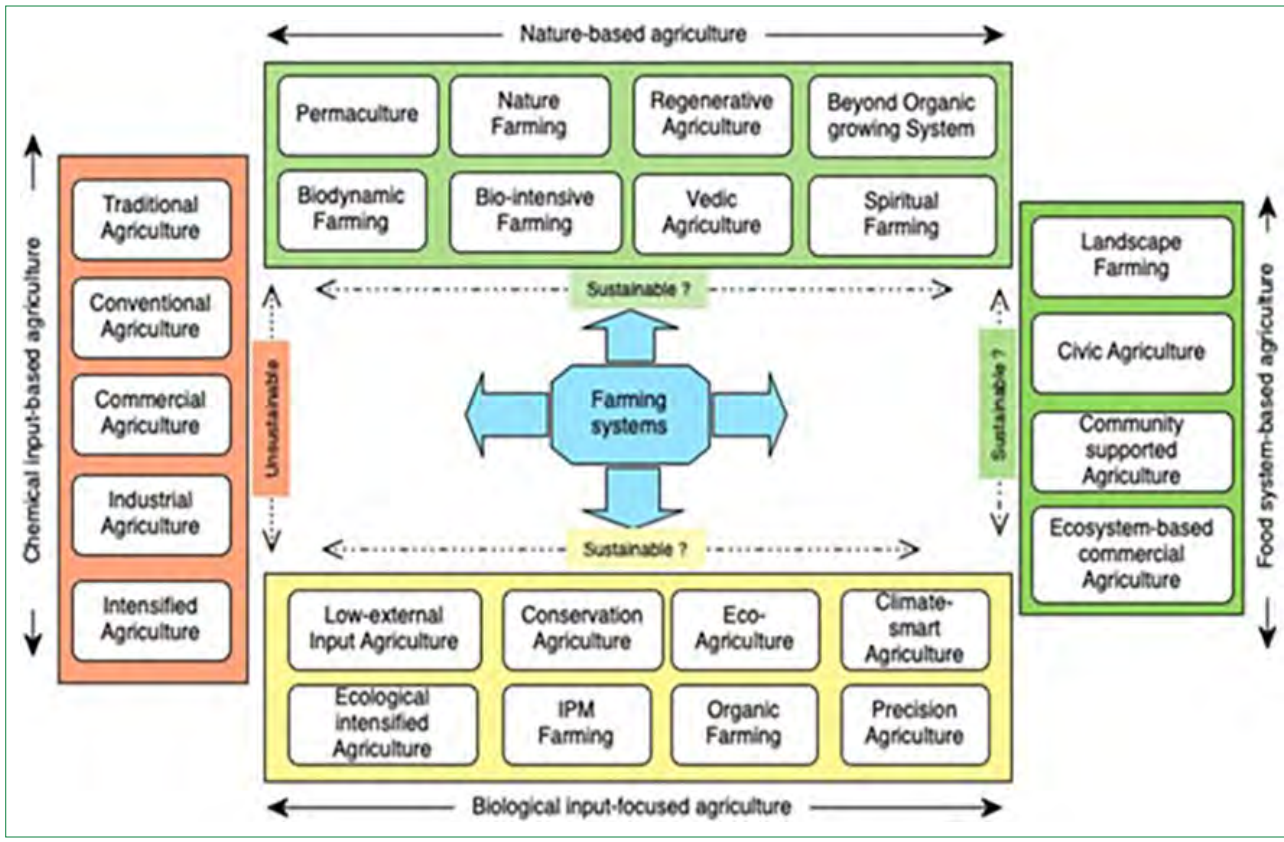

Figure 1. Classification of different forms of farming based on sustainability and main characteristics.

Source: Atreya et al. (2020).

Mollison, an Australian forester, teacher, hunter, and naturalist, and one of his students, David Holmgren, originally described the terms 'permanent culture' and 'permanent agriculture' in 1959 (Tóth, 2017). In 1988, Bill Mollison published a comprehensive guidebook entitled "Permaculture: A Designer's Manual," detailing the principles and methods behind permaculture. Permaculture emphasizes ecological design for sustainable human existence while integrating values, ethics, and personal responsibility for the Earth in its core principles (Flores, 2013). According to Mollison's definition, permaculture is "the conscious design and maintenance of agriculturally productive ecosystems with the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs sustainably" (Mollison, 1988). Based on current literature, Ferguson and Lovell (2014) also define permaculture as "the conscious design and maintenance of agriculturally productive ecosystems that have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way." The ethical principles of permaculture include the protection of the Earth, caring for people, and the fair share of goods. Permaculture implements these ethical requirements using well-defined ecological principles, design aids, conscious planning, and continuous monitoring and redesign. This approach creates natural habitats and social environments (Holmgren, 2011). Based on the international scientific literature on innovations, permaculture farming can be considered a type of grassroots innovation (Orozco-Melendez & Paneque-Gálvez 2022) rather than rural innovation (Kézai et al., 2021; Szörényiné, 2015) since its elements and methods can be applied in urban spaces as well. Budapest, for example, is a pioneer in urban permaculture (e.g., Kispest garden-urban farm, Zugló climate garden, and Rosemary garden). More authors consider permaculture as one of the grassroots landscape management approaches, inspiring practices to increase an embedded relationship with the natural world and between people (Oliveira & Penha-Lopes, 2020; Ferguson & Lovell, 2014, 2015; Maye, 2018).

Permaculture uses various methods, such as plant combinations with protective plants, composting, mulching, rainwater harvesting, and improving plant resilience, to tackle the challenges posed by climate change. These practices help plants thrive even under extreme weather conditions, such as prolonged droughts, changing seasons, and soil erosion.

Table 1. Summarizing the different forms of nature-based and food-system based agriculture

Nature-based agriculture		
Farming system	**Definition**	**Examples of principles**
Permaculture	"Permaculture (permanent agriculture) is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way. Without permanent agriculture there is no possibility of a stable social order." (Mollison 1988)	Uses ethics and design principles, locally adopted practices Care of earth, people, fair share.
Nature farming	"Nature Farming is a farming method for producing healthy quality crops abundantly by allowing the soil to exert its power to the maximum without using pesticides and chemical fertilizers. It was first advocated in 1935 by Mokichi Okada (1882-1955), a philosopher and religious leader." (INFRC 2025)	Principle: Allow the living soil to exert its great power.
Regenerative agriculture	"Regenerative agriculture is a way of farming that focuses on soil health. Regenerative farming methods include minimizing the ploughing of land." (World Economic Forum 2022)	Don't disturb the soil, keep the soil surface covered, keep living roots in the soil, grow a diverse range of crops, and bring grazing animals back to the land.
Beyond organic growing system	"Beyond Organic farming does not have an official definition because it is not a government regulated label or certification. It generally refers to agronomic practices that go beyond what is required for organic certification and aim to build healthy soil, boost biodiversity, and draw carbon from the atmosphere via methods like cover cropping and minimum tillage." (Zava Ranch 2023)	The principles of "beyond organic farming", center on the assumption that living and holistic biosystem that is nature cannot be dissected or resolved into its parts.
Biodynamic farming	Biological dynamic agriculture is a system of agricultural management based on Rudolf Steiner's 1924 lecture series. (Muhie, 2023) Biodynamic farming is a form of organic agriculture with additional specificities in its standards and the particularity of explicitly postulating the existence of a non-material dimension (Wright 2021; Rigolot-Quantin 2022).	Restore the soil through the incorporation of organic matter, treat soil as a living system; create a system that brings all factors that maintain life into balance; encourage the use and significance of green manure, crop rotation, and cover crops; treat manure and compost in a biodynamic way; and have insights about the use of enzymes and hormones.
Bio-intensive farming	"Bio-intensive agriculture is an organic agricultural system that uses no fossil-fuel based fertilizers. The practice focuses on achieving maximum yields from a minimum area of land, while simultaneously increasing biodiversity and sustaining or restoring soil fertility." (WCCI 2025)	It is regenerative, providing greater soil health over the long term without the cost and environmental burden of materials from external sources.
Vedic agriculture	"Vedic Farming is a Holistic approach aiming at purifying the ecosystem. Plants and animals play a very important role as the basic inputs used in the process of Vedic Farming like ghee, milk, honey, dung or botanical extracts are mainly derived from them." (Guduru 2022)	It is the theory of agriculture expounded in such manner that the farmers would benefit by its proper implementation. This treatise includes observations on all aspects of agriculture such as meteorological observations relating to agriculture, management of agriculture, management of cattle, agricultural tools, seed collection and preservation, ploughing and all the agricultural processes involved right from seasonal field preparations to harvesting of crops and storage of output.

Table 1 (cont.). Summarizing the different forms of nature-based and food-system based agriculture

Nature-based agriculture		
Spiritual farming	Spiritual farming or Zero Budget Natural Farming (ZBNF) is the most effective way to lower farmers' input costs. (Ajaykumar et. al. 2025) The term 'budget' is used to describe credit and expenditures, and using no credit and without spending any money on purchased inputs is referred to as a "zero budget". 'Natural farming' refers to farming that is done in harmony with nature and without the use of chemicals (Smith et al., 2020).	Building elements of ZBNF are jeevamrith, bijamrith, mulching and soil aeration. These four principles contribute to improved soil health, microbial population and crop output. Intercropping, contour bunds, crop rotation, green manures, compost, and biological pest management is some of the other fundamental elements.
Food-system based agriculture		
Landscape farming	"Landscape approaches" seek to provide tools and concepts for allocating and managing land to achieve social, economic, and environmental objectives in areas where agriculture, mining, and other productive land uses compete with environmental and biodiversity goals. (Sayer et. al. 2013)	Continual learning and adaptive management, common concern entry point, multiple scales, multifunctionality, multiple stakeholders, negotiated and transparent change logic, clarification of rights and responsibilities, participatory and user-friendly monitoring, resilience, strengthened stakeholder capacity.
Civic agriculture	"Civic agriculture," a term first coined by rural sociologist Thomas Lyson, refers to forms of agriculture that occur on a local level, from production to consumption, and are linked to a community's social and economic development. (Kaika & Racelis 2021).	The food- from its production to its consumption - is a product of complex environmental and social interactions.
Community supported agriculture	Community-supported agriculture is "a direct partnership between a group of consumers and producer(s) whereby the risks, responsibilities and rewards of farming activities are shared through long-term agreements." (FAO 2016)	Shared benefits and liabilities, resilient communities, and agricultural economy, promote civic engagement.
Ecosystem-based commercial agriculture	The ecosystem-based approach (EBA) is a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way. (Richter et al. 2015)	Integrated management of land, water, and living resources.

Source: Own compilation and addition based on Ajaykumar et. al., 2025; FAO, 2016; INFRC, 2025; Guduru, 2022; Kaika & Racelis, 2021; Mollison, 1988; Muhie, 2023; Richter et al., 2015; Rigolot-Quantin, 2022; Sayer et al., 2013; Smith et al., 2020; WCCI, 2025; World Economic Forum, 2022; Wright, 2021; Zava Ranch, 2023.

Methodology

This paper aims to illustrate the current situation of environmentally sustainable agriculture in Hungary, focusing on permaculture as an innovative practice that is increasingly gaining traction in the country. Examples of successful sustainable agriculture in Hungary may inspire similar adaptations in other countries, thereby promoting the broader spread of climate-conscious and environmentally friendly food production. The paper addresses how farmers define permaculture in Hungary, the benefits this farming method offers, and ways to encourage its wider adoption throughout the country.

To achieve this goal, the paper uses primary and secondary data. The primary data for this study was collected through in-depth interviews with four permaculture farmers in Hungary in November 2023. These farmers were selected from the Hungarian Permaculture Association's map database, which is the main organization representing permaculture farmers in Hungary. Among the interviewees, one is a full-time farmer, while the others are part-time permaculture practitioners. When selecting participants for the in-depth interviews, it was essential to include individuals from various regions of Hungary, specifically those whose permaculture farms are located in urban areas or agglomerations. Diversity was also a key factor regarding the size of the farms and their establishment dates. This included both new initiatives, such as the permaculture garden in Kunsziget, and farms that have been operational for at least ten years, like those in Törökbálint, Seregélyes, and Sokorópátka. Additionally, the farms vary in their farming objectives. For example, the farm in Törökbálint engages in commodity production, whereas the other three farms focus on achieving self-sufficiency for their families. The selected farms also differ in terms of the types of products they cultivate. In Törökbálint, Sokorópátka, and Seregélyes, livestock is integrated into their permaculture systems, while Kunsziget currently focuses exclusively on growing vegetables using a permaculture

approach. The interviews took the form of online discussions and covered the interviewee's definition of permaculture, how long they have been involved in it, what sources they use to learn about it, how they practice permaculture, and how they see the opportunities and obstacles to its spread.

In addition, monthly observations and knowledge-sharing took place at the Pannonhalma Permaculture Club (PAPEK) events for a year. These were occasional 3-hour meetings, where usually 10–12 people with a permaculture garden or farm could share their practical experience in person. Furthermore, four visits to permaculture and community gardens in urban agglomerations (near the city of Győr) supported the work, observing the practical side of this form of farming. As for secondary data, a review of relevant national and international literature on the topic supported the work.

Permaculture in Hungary: Benefits, Brief History and Main Characteristics

As far as permaculture and its benefits are concerned, it can be defined as an umbrella term that describes a broad range of practices and systems to optimize the interactions between the soil and plant systems. It efficiently utilizes various ecological functionalities to maximize ecosystem health and provide a broad suite of ecosystem services (Didarali & Gambiza, 2019; McLennon et al., 2021). These can be considered as environmental benefits. Besides this, there are also economic and social benefits to this form of farming. Economic benefits come from the potential for local job creation, lower food costs for residents, and reduced maintenance costs for green spaces. Last but not least, permaculture has social benefits as well. It can improve the mental health and well-being of the community and provide educational opportunities, and support community engagement, such as by thinking about the increasingly popular permaculture community gardens.

As far as the brief history is concerned, the first trials of Hungarian permaculture started in the 1990s. At this time, the first Hungarian ecovillage, "Gyűrűfű," was created by a group of young Hungarian ecologists who dreamed of having a large plot of land protected by permaculture (Domingos, 2018). In 1994, this ecovillage became one of the locations of Hungary's first permaculture design course (Gyurufu.net, 2024). A grassroots initiative started in 2006 to promote permaculture in Hungary by enthusiastic practitioners. After 10 years, the Hungarian Permaculture Association (MAPER) has been established (Centeri et al., 2021) to introduce permaculture to even more people, organize permaculture education, and build relationships with permaculture organizations from other countries. The work teams of the association cover a wide spectrum of activities, including research, design, and education, as well as managing a club in Budapest (Hungarian Permaculture Association, 2024).

The professional community has developed enormously in Hungary in the last few years. Every year, more and more training courses, clubs, groups, and professional organizations are being set up, and more and more Hungarian literature on the subject is available. In addition, the number of permaculture designers and services is growing (Szabó, 2024). Permaculture design courses (PDCs) are offered by various organizations and individuals in Hungary. Moreover, some universities (like the Hungarian University of Agriculture and Life Sciences) are incorporating permaculture principles into their educational programs or providing one-day courses, which helps introduce permaculture concepts to a wider audience (Gál et al., 2022).

All in all, today, in Hungary, there is a wide variety of initiatives related to alternative, sustainable, environmentally friendly agriculture and food production in the fields of agricultural practice, distribution, agricultural research, and higher education, but these activities are fragmented and disjointed (Balázs et al., 2020). A map database about permaculture farms, households, and services in Hungary created by the Hungarian Permaculture Association (MAPER) currently presents 49 projects (01.08.2024). Based on this database, the period of 2011–2020 was the peak in terms of permaculture farm creation, with almost 60% of the farms registered so far. The establishment of the Hungarian Permaculture Association, which started to register this type of initiative and spread permaculture farming more widely, probably played a role in reaching this peak (Fig. 1).

These farms cover 354,9 hectares (3,5 km^2), with 175 hectares occupied by the Gyűrűfű ecovillage, which is one of the first permaculture initiatives in Hungary. More than half of the farms are less than one hectare, and almost one-third are between one and 5 hectares. The permaculture approach can also be applied to larger plot sizes, over 15 hectares, and three examples are included in the Hungarian Permaculture Association's database (Figs. 2, 3).

Key Findings From In-depth Interviews with Permaculture Farmers in Hungary

Three of the four permaculture farmers (in Törökbálint, Seregélyes, and Sokorópátka) selected for the in-depth interviews in Hungary have been using this type of farming for more than ten years and have also obtained a permaculture design qualification (PDC), while one farmer (in Kunsziget) has been learning the method for three years and plans to continue practicing it in the future. In-depth interviews with four permaculture farmers can help answer the question of whether there are differences between the international literature and the Hungarian approach to permaculture. On this question, we see that the respondents have indeed reinterpreted Mollison's approach, developing their own vision and preference system for permaculture. According to one farmer in Western Hungary, permaculture can be defined as "an artificially engineered, chemical-free, sustainable ecosystem where

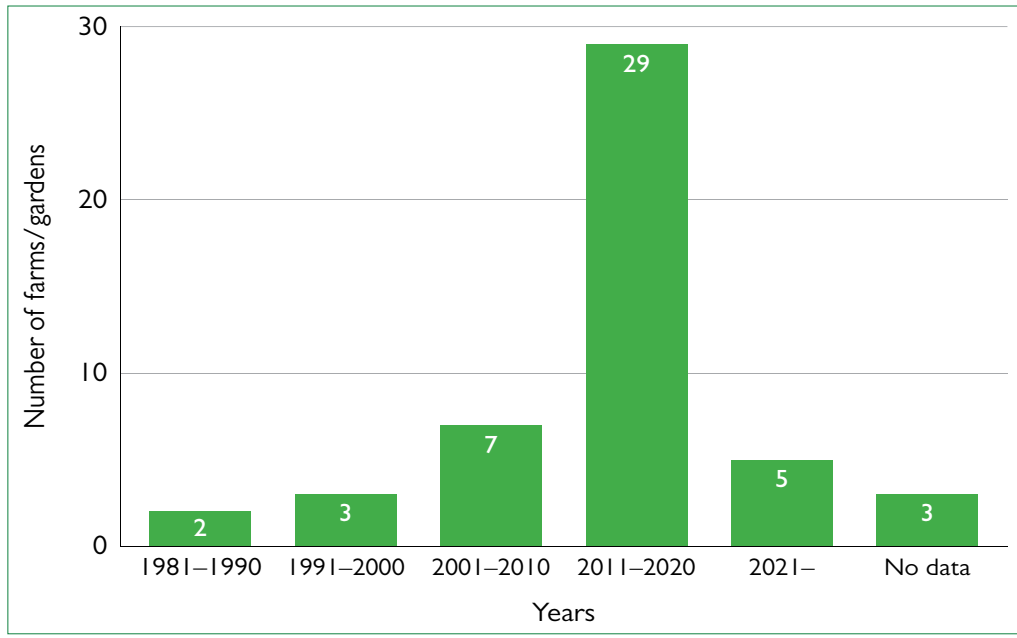

Figure 2. The year of creation of permaculture farms, households and services based on the Hungarian Permaculture Association's database (N=49).

Edited by author based on Hungarian Permaculture Association's map database, 2024.

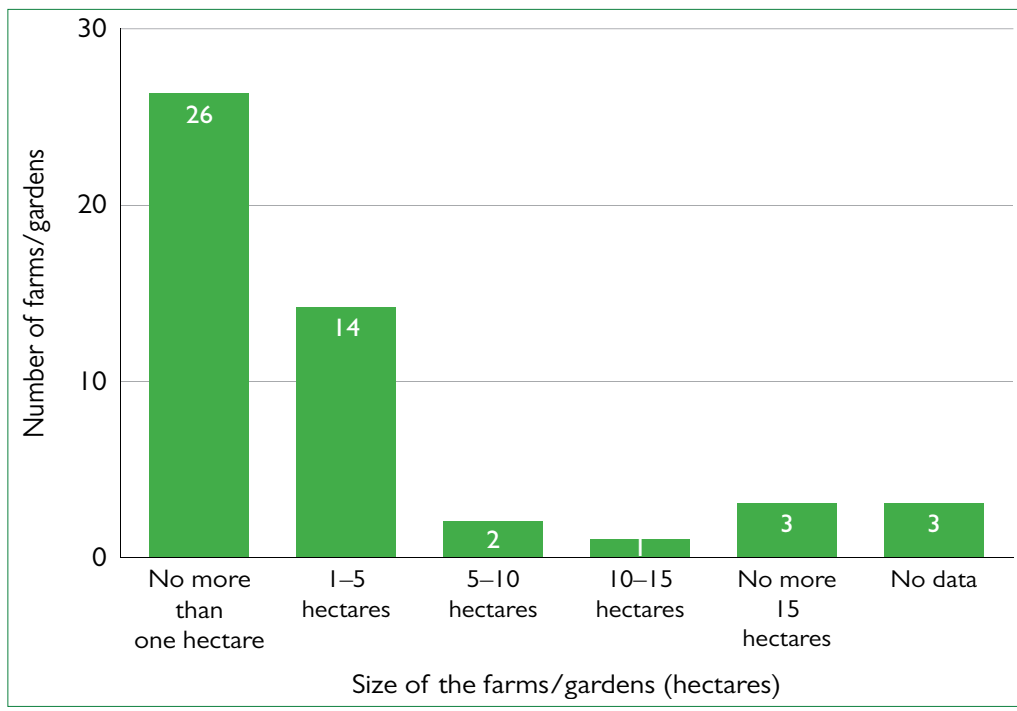

Figure 3. Plot size of permaculture farms, households and services based on the Hungarian Permaculture Association's database (N=49) (2024).

Edited by author based on Hungarian Permaculture Association's map database, 2024.

small- and large-scale ecosystems are best compatible with each other, both in terms of soil life and plant and animal communities. The aim is to maintain this balance in the long term." Another farmer defines permaculture as "sustainable agriculture itself, a kind of green initiative in which we try to create a state close to nature, where man is part of nature and not exploiting it. The aim is to find a natural balance between society and the environment."

Furthermore, the interviewee, who has a farm in the Budapest agglomeration (in Törökbálint), emphasized the importance of local communities. According to his approach, "permaculture is a systemic planning method based on ethical principles that aims to create well-functioning local communities in harmony with nature." Another farmer in Western Hungary interpreted permaculture as a "complex approach to life that goes far beyond gardens and farms," as he considers the use of permaculture techniques in harmony with nature as part of everyday life. It therefore requires a multidisciplinary approach, beyond the agroecological aspects of previous studies.

The interviewees' responses were consistent in that they were looking for new ways and innovative solutions to produce healthier food and greater self-sufficiency while doubting the methods of industrial agriculture in the development of permaculture and in planning their gardens or farms. One of them now sells his produce locally, and three of them grow vegetables, fruit, herbs, and livestock for their own families. When asked about their primary sources of information when it comes to the development of their permaculture economy, all of them pointed out that there are excellent books on the subject, and they also mentioned online platforms, professional support available within the Hungarian Permaculture Association, the internal library, and personal contacts as important sources of information.

To investigate the spatial spread of permaculture, the in-depth interview asked whether the interviewees' acquaintances, relatives, friends, or the local population were interested in this form of farming, or whether there were examples of people who had started permaculture in their locality or the wider community as a result of the interviewee. In this respect, an important finding of the interviewees is that there is still a high level of misunderstanding about permaculture. There is some interest and questions from people living in the environment, but no breakthroughs can be observed as a result of the permaculture farmer's approach and knowledge transfer activities. In the case of one settlement, the permaculture farmer saw the lack of community life and social contacts as the main reason for this, while others explained that it takes time and that society needs to mature.

One important way of promoting permaculture is for farmers to offer individual or group visits to their gardens. There are examples of both types among the respondents. The age of visitors is quite heterogeneous. The age of individual visitors varies between 30 and 70 years. The farm in Budapest agglomeration does not receive individual visitors but regularly welcomes groups from kindergartens and schools for educational purposes. In addition, there is a large group of people over 60 who also visit the farm in an organised way. Their motivation is typically to overcome the challenges of declining health by learning new farming techniques.

Overall, based on the experiences of the in-depth interviews and the observations, it can be said that, despite the high level of misunderstanding, there is a segment of the population that is receptive to this innovation, but it will take a long time before either permaculture or other forms of nature-based farming can become more widespread in Hungary.

Discussion and Conclusion

The demand for clean, chemical-free food has grown worldwide. The different forms of nature-based agriculture provide an opportunity to address these needs and foster community participation. Permaculture, the specific form examined in this study, is noteworthy for its adaptability, as, based on the Hungarian Permaculture Association's database, it can be implemented in small gardens, large farms, and in rural and urban areas as well. In Hungary, the adoption of permaculture principles dates back to the 1990s, gaining popularity after 2010. The main motivations of the interviewed permaculture farmers are the more extreme conditions and access to clean and healthy food. Many initiatives, such as professional organisations (e.g., Hungarian Permaculture Association), educational institutions (e.g., a biogarden in permaculture approach at the Hungarian University of Agriculture and Life Sciences), and the activities of local groups (e.g., Pannonhalma Permaculture Club) have emerged to support individual or community-based food self-sufficiency and exchanges in Hungary. However, these efforts are currently relatively isolated across the country, with limited knowledge sharing. To fully leverage knowledge sharing and sustainable food production opportunities, there is a need for a well-organized national or even international network to bring together all such initiatives in the future, encompassing not only permaculture initiatives but also all existing forms of sustainable food production.

In summary, we can see that different forms of nature-based agriculture are increasingly gaining ground over traditional agriculture. Looking at permaculture farming critically, its acceptance in social contexts can vary. This lack of widespread acceptance may sometimes result in conflicts with neighbours, particularly concerning aspects like unmown lawns and what may be perceived as a disordered appearance in permaculture gardens. Such misunderstandings can arise from unfamiliarity with permaculture practices and principles. From an economic standpoint, while some permaculture farms successfully produce crops for sale, their yields can be less predictable when compared to those from standardized monocropping organic farms. Furthermore, the mechanization processes used in permaculture tend to be more complex and challenging than those utilized in conventional organic farming, which can impact operational efficiency.

The above findings, especially the high level of misunderstanding, were confirmed by the in-depth interviews conducted during the research, which could be promoted by informing local society, transferring knowledge to them, and strengthening social contacts and cooperation between professional organisations in the future.

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Planlama 2025;Supp(1):123–133 | doi: 10.14744/planlama.2025.80847

REVIEW / DERLEME

Sustainable Urban Food Production with a Special Focus on Permaculture from Hungarian Perspectives

Macar Perspektifinden Permakültüre Özel bir Odaklanma ile Sürdürülebilir Kentsel Gıda Üretimi

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ABSTRACT

In recent years, there has been a growing interest in sustainable agriculture and food production in Hungary as well. Moreover, as today's climate change significantly impacts agriculture, there is increased scrutiny of conventional agriculture, with various sustainable agriculture concepts emerging, such as climate-smart agriculture, regenerative or conservation agriculture, organic farming, permaculture, and agroforestry. This review article compares different sustainable agriculture approaches in terms of their definitions and principles based on the scientific literature, showing that urban spaces are also suitable for sustainable food production.This study aims to provide insights into the current state of environmentally sustainable agriculture in Hungary, focusing specifically on permaculture as an innovative practice that is gaining traction in the country. Permaculture represents one of the most advanced forms of sustainable farming and gardening in Hungary. It benefits from a well-developed institutional framework, as well as robust educational and training resources. Moreover, permaculture can be practiced in both rural and urban areas, making it suitable for expansion across all regions. Additionally, successful examples of sustainable agriculture in Hungary may inspire similar initiatives in other countries, thus promoting the broader adoption of climate-friendly and environmentally sustainable food production methods. The paper seeks to answer several key questions: How do Hungarian farmers define permaculture? What advantages does this farming method offer? And how can its adoption be encouraged more widely throughout the country? Hungary's experiences can serve as a valuable model for other nations aiming to foster environmentally sustainable and climate-friendly farming practices.

Keywords: Farming; Hungary; permaculture; sustainable agriculture.

ÖZ

Son yıllarda Macaristan'da da sürdürülebilir tarım ve gıda üretimine yönelik ilgi giderek artmaktadır. Ayrıca, günümüzde iklim değişikliği tarımı önemli ölçüde etkilediğinden, konvansiyonel tarıma yönelik incelemeler artmakta ve iklim-akıllı tarım, rejeneratif veya korumacı tarım, organik tarım, permakültür ve agroforestri gibi çeşitli sürdürülebilir tarım kavramları ortaya çıkmaktadır. Bu derleme makalesi, farklı sürdürülebilir tarım yaklaşımlarını tanımları ve ilkeleri açısından bilimsel literatüre dayanarak karşılaştırmakta ve kentsel alanların da sürdürülebilir gıda üretimi için uygun olduğunu göstermektedir. Bu çalışma, Macaristan'da çevresel açıdan sürdürülebilir tarımın mevcut durumu hakkında bilgi vermeyi amaçlamakta ve özellikle ülkede ilgi gören yenilikçi bir uygulama olarak permakültüre odaklanmaktadır. Permakültür, Macaristan'da sürdürülebilir tarım ve bahçeciliğin en gelişmiş biçimlerinden birini temsil etmektedir. İyi geliştirilmiş bir kurumsal çerçevenin yanı sıra sağlam eğitim ve öğretim kaynaklarından faydalanmaktadır. Dahası, permakültür hem kırsal hem de kentsel alanlarda uygulanabilir, bu da onu tüm bölgelere yayılmaya uygun hale getirir. Ayrıca, Macaristan'daki başarılı sürdürülebilir tarım örnekleri diğer ülkelerdeki benzer girişimlere ilham verebilir, böylece iklim dostu ve çevresel açıdan sürdürülebilir gıda üretim yöntemlerinin daha geniş çapta benimsenmesini teşvik edebilir. Bu çalışma birkaç temel soruya yanıt aramaktadır: Macar çiftçiler permakültürü nasıl tanımlıyor? Bu tarım yöntemi ne gibi avantajlar sunuyor? Ve ülke genelinde benimsenmesi nasıl daha yaygın bir şekilde teşvik edilebilir? Macaristan'ın deneyimleri, çevresel açıdan sürdürülebilir ve iklim dostu tarım uygulamalarını teşvik etmeyi amaçlayan diğer ülkeler için değerli bir model oluşturabilir.

Anahtar sözcükler: Çiftçilik; Macaristan; permakültür; sürdürülebilir tarım.

Received: 21.08.2024 Revised: 06.03.2025
Accepted: 07.06.2025 Available online date: 19.08.2025
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TMMOB Şehir Plancıları Odası

Introduction

The loss of biodiversity and degradation of soil, water, and ecosystems mean significant challenges for humanity. The depopulation of rural areas, health problems related to nutrition, and obstruction of access to quality and nutritious food all justify the initiation of drastic changes in the areas of food production, distribution, and consumption (Frison-IPES-Food, 2016; Wezel et al., 2018; Balázs et al., 2020, 2021). Despite this, conventional agriculture is the most common typology in developed countries. This system is large-scale, dependent on inputs (synthetic fertilizers and agroprotectants), and highly mechanized. It has historically leveraged standard soil preparation methods (e.g., ploughing followed by sowing), and the yields per unit area are maximized. Conventional farming methods are highly context-dependent, meaning they only work with their full economic potential if production inputs are low, environmental factors and the market are stable, and an income exceeding the general cost of production can be realized (Molnár & Fraser, 2020). It is worth mentioning that monoculture plays a crucial role in land degradation (Pacheco et al., 2018), which over time develops into a myriad of other environmental (e.g., reduction in land productivity, soil erosion, water quality deterioration, loss of biodiversity, dysfunctionality of ecosystems, and so on) problems. As monoculture activities continue to intensify, soil and water erosion and fertility loss will affect the quality and productivity of soil health (Crews et al., 2018; McLennon et al., 2021). All in all, many questions arise about the long-term sustainability of such an approach (Durham & Mizik, 2021) since the expansion of conventional agricultural productive techniques is producing an ecological crisis worldwide (Martínez-Castillo, 2016). Numerous studies show that the critical factors are already and will continue to face increasingly significant challenges in the future, necessitating the well-founded debate on the future of agriculture (European Environment Agency, 2023), as well as rethinking and redesigning our food production systems (Perfecto et al., 2009; Ranganathan et al., 2018).

In response to various challenges related to conventional agriculture, the Common Agricultural Policy (CAP) 2023–27 entered into force on 1 January 2023. The CAP is built around three main goals to achieve a sustainable system of agriculture in the EU: economic sustainability, environmental sustainability, and the social sustainability of farms. To meet these goals, EU countries use a wide range of targeted actions to address each country's specific needs and create CAP Strategic Plans. Through these plans, EU countries provide income support to farmers, support them in the transition towards sustainable production, and contribute towards the ambitions of the EU Green Deal, the EU's sustainable and inclusive growth strategy. The European agriculture and food system, supported by the CAP, is already a global standard in terms of safety, security of supply, nutrition, and quality. Now, it must also become the standard for sustainability (European Commission, 2024a, 2024b).

Hungary's CAP Strategic Plan (2023–2027) emphasizes the country's unique natural features contributing to favourable agricultural conditions. Since 2020, the size of Hungary's farmland has remained relatively stable, with 5.3 million hectares dedicated to agricultural cultivation. However, the number of agricultural operations has decreased by 19 percent due to ongoing consolidation in the sector. As of June 1, 2023, the inventories of cattle, swine, sheep, and turkeys were lower compared to the previous year, while the number of chickens, geese, and ducks had increased. The plant production within the country's agricultural economy continues to rise. Agriculture accounts for 4.8% of national employment, while the food industry makes up 3.2%. Hungary has approximately 430,000 farmers, around 30% of them over 64 years old. Additionally, forests cover 23% of the country's territory, and 43% of the land is protected by the Natura 2000 program (Foreign Agricultural Service, 2023).

The agri-food sector in Hungary is currently facing significant challenges, and its transformation is being driven by two key trends: digitization and ecologization, which means a more ecological approach. These trends align with the primary objectives of the Green Deal and the new Common Agricultural Policy (CAP) for the period following 2023. From a sustainability perspective, Hoyk et al. (2022a) identified five policy gaps in Hungarian strategies: (1) lack of an ecological approach, (2) climate change does not receive enough attention, (3) complex landscape management does not appear in the documents, (4) measures that increase inequalities between farmers, and (5) the Digital Food Industry Strategy does not deal with healthy food consumption and issues of food waste.

The study aims to shed light on the current situation of environmentally sustainable agriculture in Hungary, with a special focus on permaculture as an innovation that is increasingly spreading in the country. As we will see in the theoretical overview of the topic, there are many different types of sustainable agriculture. The present study focuses on permaculture because it is one of the most advanced types of sustainable farming and gardening in Hungary, with the most developed institutional framework and educational and training background, and because it can be applied not only in rural but also in urban areas so all regions can be suitable for the expansion. Good examples of sustainable agriculture in Hungary may inspire similar adaptations in other countries, thus helping to promote the wider spatial spread of climate and environmentally friendly food production. The paper tries to answer the question of how permaculture is defined

in Hungary by the farmers who practice it, what advantages this farming method offers, and how it can be more widely adopted throughout the country. Hungary's example can be a starting point for other countries to promote environmentally sustainable and climate-friendly farming.

Theoretical Framework: Agroecology and Sustainable Agriculture, with a Special Focus on Permaculture

The term "agroecology" first appeared in academic discourse in the early 20th century focused on pest management and soil biology. In the 1960s, as environmental movements gained momentum, agroecology shifted toward advocating for alternatives to industrial, chemical-intensive farming. This perspective encouraged agronomists to reconsider their practices' ecological and social impacts while promoting "natural ways of farming." Over time, agroecology expanded beyond scientific circles to become a recognized social movement emphasizing sustainability and equitable benefits in agriculture. Agroecology continued to grow as both a science and a movement throughout the 1990s, particularly as the environmental agenda gained momentum in the USA and Latin America. By the 2000s, discussions around agroecology began to emphasize the entire food system, linking production with processing, distribution, and consumption (IPES-Food, 2022).

The terms "sustainable development" and "sustainability" have also been increasingly in the public consciousness from the 1960s to the present day (Carson, 1962; Centeri et al., 2002; Martinát et al., 2016; Hoyk et al., 2022b; Hardi, 2023), and there are many discussions and dialogues about what these concepts mean and how they can be applied (Meadows, 1972; VTA, 2000; Vida, 2004). The term "sustainability" already appeared in agriculture several decades ago, and in parallel, adaptation into practice was tried to find solutions and technologies faithful to the concept (Ángyán, 1991; Gliessman, 2006; FAO, 2014; Szilágyi et al., 2018). According to the definition of Rajbhandari (2019), agriculture and rural development are sustainable when they are ecologically non-degrading, economically viable, politically non-discriminatory, socially acceptable, technologically appropriate, and based on a holistic scientific and system approach. Sustainable agriculture and rural development can be described as an initiative meant to meet the food or nutritional requirements and other needs of present and future generations, providing durable and decent employment, maintaining and enhancing the productive and regenerative capacity of the natural resource base, as well as reducing vulnerability and strengthening self-reliance of local people, particularly farming communities. Sustainable agriculture is neither linked to any particular technological practice nor an exclusive domain of organic farming (Rajbhandari, 2019).

According to Atreya et al. (2020), farming systems can be classified into four distinct types based on their inputs and sustainability. Agriculture can be categorized into four distinct types based on their sustainability practices. The first category is chemical input-based agriculture, which includes traditional and industrial methods that are generally considered unsustainable. In contrast, the second category, biological input-focused agriculture, comprises practices such as organic farming, conservation agriculture, and integrated pest management. The sustainability of these methods is seen as debatable. The third category, food system-based agriculture, encompasses practices like community-supported agriculture and ecosystem-based farming, which are regarded as more sustainable. Finally, there is nature-based agriculture, which includes techniques such as permaculture, biodynamic, bio-intensive and regenerative agriculture. This category is viewed as the most sustainable, highlighting the importance of holistic approaches to farming that prioritize environmental health and sustainability (Fig. 1).

This paper focuses on nature-based and food system- based agriculture, as permaculture also falls into this group. As there are often difficulties in interpreting the concepts, Table 1 summarizes the definitions and principles of these approaches.

The table illustrates the distinctions between various types of farming, categorized as nature-based and food-system based agriculture. This study will now focus specifically on permaculture, which has an increasing significance in Hungary. The institutional framework and organizational system supporting this approach are continually evolving in the country. Professional organizations offer training courses throughout the year, host conferences, and facilitate community knowledge-sharing events, including popular visits to permaculture gardens. Permaculture is particularly engaging for a variety of disciplines beyond agriculture and agroecology, as it influences human behavior in many aspects of daily life. It promotes a minimalist lifestyle and encourages the use of local resources, extending beyond the garden. This shift can alter consumption patterns, steering individuals and households toward greater self-sufficiency rather than excessive reliance on industrial products, ultimately resulting in a higher quality of life. Furthermore, permaculture can be applied in both urban and rural settings, across varying scales, and can shape landscapes and communities through the development of permaculture gardens and groups. Additionally, a personal connection to permaculture—through owning a permaculture garden and participating in a professional permaculture group—has motivated the choice of this research topic.

First of all, it is important to mention that permaculture is not just a farming system but also a nature-centred approach based on ethical and management principles focused on conserving the Earth and nature (Centeri et al., 2021). The concept of permaculture has been defined in various ways. Bill

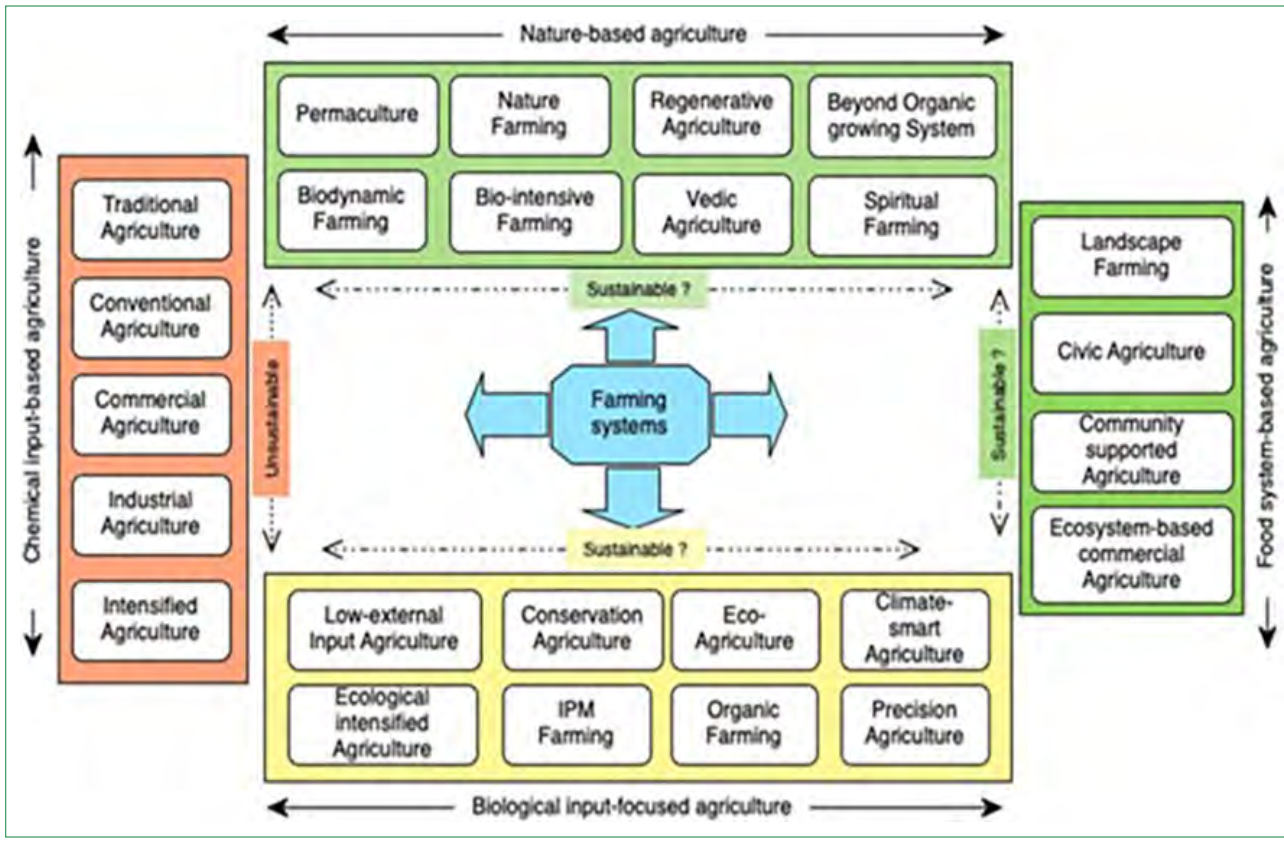

Figure 1. Classification of different forms of farming based on sustainability and main characteristics.

Source: Atreya et al. (2020).

Mollison, an Australian forester, teacher, hunter, and naturalist, and one of his students, David Holmgren, originally described the terms 'permanent culture' and 'permanent agriculture' in 1959 (Tóth, 2017). In 1988, Bill Mollison published a comprehensive guidebook entitled "Permaculture: A Designer's Manual," detailing the principles and methods behind permaculture. Permaculture emphasizes ecological design for sustainable human existence while integrating values, ethics, and personal responsibility for the Earth in its core principles (Flores, 2013). According to Mollison's definition, permaculture is "the conscious design and maintenance of agriculturally productive ecosystems with the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs sustainably" (Mollison, 1988). Based on current literature, Ferguson and Lovell (2014) also define permaculture as "the conscious design and maintenance of agriculturally productive ecosystems that have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way." The ethical principles of permaculture include the protection of the Earth, caring for people, and the fair share of goods. Permaculture implements these ethical requirements using well-defined ecological principles, design aids, conscious planning, and continuous monitoring and redesign. This approach creates natural habitats and social environments (Holmgren, 2011). Based on the international scientific literature on innovations, permaculture farming can be considered a type of grassroots innovation (Orozco-Melendez & Paneque-Gálvez 2022) rather than rural innovation (Kézai et al., 2021; Szörényiné, 2015) since its elements and methods can be applied in urban spaces as well. Budapest, for example, is a pioneer in urban permaculture (e.g., Kispest garden-urban farm, Zugló climate garden, and Rosemary garden). More authors consider permaculture as one of the grassroots landscape management approaches, inspiring practices to increase an embedded relationship with the natural world and between people (Oliveira & Penha-Lopes, 2020; Ferguson & Lovell, 2014, 2015; Maye, 2018).

Permaculture uses various methods, such as plant combinations with protective plants, composting, mulching, rainwater harvesting, and improving plant resilience, to tackle the challenges posed by climate change. These practices help plants thrive even under extreme weather conditions, such as prolonged droughts, changing seasons, and soil erosion.

Table 1. Summarizing the different forms of nature-based and food-system based agriculture

Nature-based agriculture		
Farming system	**Definition**	**Examples of principles**
Permaculture	"Permaculture (permanent agriculture) is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way. Without permanent agriculture there is no possibility of a stable social order." (Mollison 1988)	Uses ethics and design principles, locally adopted practices Care of earth, people, fair share.
Nature farming	"Nature Farming is a farming method for producing healthy quality crops abundantly by allowing the soil to exert its power to the maximum without using pesticides and chemical fertilizers. It was first advocated in 1935 by Mokichi Okada (1882-1955), a philosopher and religious leader." (INFRC 2025)	Principle: Allow the living soil to exert its great power.
Regenerative agriculture	"Regenerative agriculture is a way of farming that focuses on soil health. Regenerative farming methods include minimizing the ploughing of land." (World Economic Forum 2022)	Don't disturb the soil, keep the soil surface covered, keep living roots in the soil, grow a diverse range of crops, and bring grazing animals back to the land.
Beyond organic growing system	"Beyond Organic farming does not have an official definition because it is not a government regulated label or certification. It generally refers to agronomic practices that go beyond what is required for organic certification and aim to build healthy soil, boost biodiversity, and draw carbon from the atmosphere via methods like cover cropping and minimum tillage." (Zava Ranch 2023)	The principles of "beyond organic farming", center on the assumption that living and holistic biosystem that is nature cannot be dissected or resolved into its parts.
Biodynamic farming	Biological dynamic agriculture is a system of agricultural management based on Rudolf Steiner's 1924 lecture series. (Muhie, 2023) Biodynamic farming is a form of organic agriculture with additional specificities in its standards and the particularity of explicitly postulating the existence of a non-material dimension (Wright 2021; Rigolot-Quantin 2022).	Restore the soil through the incorporation of organic matter, treat soil as a living system; create a system that brings all factors that maintain life into balance; encourage the use and significance of green manure, crop rotation, and cover crops; treat manure and compost in a biodynamic way; and have insights about the use of enzymes and hormones.
Bio-intensive farming	"Bio-intensive agriculture is an organic agricultural system that uses no fossil-fuel based fertilizers. The practice focuses on achieving maximum yields from a minimum area of land, while simultaneously increasing biodiversity and sustaining or restoring soil fertility." (WCCI 2025)	It is regenerative, providing greater soil health over the long term without the cost and environmental burden of materials from external sources.
Vedic agriculture	"Vedic Farming is a Holistic approach aiming at purifying the ecosystem. Plants and animals play a very important role as the basic inputs used in the process of Vedic Farming like ghee, milk, honey, dung or botanical extracts are mainly derived from them." (Guduru 2022)	It is the theory of agriculture expounded in such manner that the farmers would benefit by its proper implementation. This treatise includes observations on all aspects of agriculture such as meteorological observations relating to agriculture, management of agriculture, management of cattle, agricultural tools, seed collection and preservation, ploughing and all the agricultural processes involved right from seasonal field preparations to harvesting of crops and storage of output.

Table 1 (cont.). Summarizing the different forms of nature-based and food-system based agriculture

Nature-based agriculture		
Spiritual farming	Spiritual farming or Zero Budget Natural Farming (ZBNF) is the most effective way to lower farmers' input costs. (Ajaykumar et. al. 2025) The term 'budget' is used to describe credit and expenditures, and using no credit and without spending any money on purchased inputs is referred to as a "zero budget". 'Natural farming' refers to farming that is done in harmony with nature and without the use of chemicals (Smith et al., 2020).	Building elements of ZBNF are jeevamrith, bijamrith, mulching and soil aeration. These four principles contribute to improved soil health, microbial population and crop output. Intercropping, contour bunds, crop rotation, green manures, compost, and biological pest management is some of the other fundamental elements.
Food-system based agriculture		
Landscape farming	"Landscape approaches" seek to provide tools and concepts for allocating and managing land to achieve social, economic, and environmental objectives in areas where agriculture, mining, and other productive land uses compete with environmental and biodiversity goals. (Sayer et. al. 2013)	Continual learning and adaptive management, common concern entry point, multiple scales, multifunctionality, multiple stakeholders, negotiated and transparent change logic, clarification of rights and responsibilities, participatory and user-friendly monitoring, resilience, strengthened stakeholder capacity.
Civic agriculture	"Civic agriculture," a term first coined by rural sociologist Thomas Lyson, refers to forms of agriculture that occur on a local level, from production to consumption, and are linked to a community's social and economic development. (Kaika & Racelis 2021).	The food- from its production to its consumption - is a product of complex environmental and social interactions.
Community supported agriculture	Community-supported agriculture is "a direct partnership between a group of consumers and producer(s) whereby the risks, responsibilities and rewards of farming activities are shared through long-term agreements." (FAO 2016)	Shared benefits and liabilities, resilient communities, and agricultural economy, promote civic engagement.
Ecosystem-based commercial agriculture	The ecosystem-based approach (EBA) is a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way. (Richter et al. 2015)	Integrated management of land, water, and living resources.

Source: Own compilation and addition based on Ajaykumar et. al., 2025; FAO, 2016; INFRC, 2025; Guduru, 2022; Kaika & Racelis, 2021; Mollison, 1988; Muhie, 2023; Richter et al., 2015; Rigolot-Quantin, 2022; Sayer et al., 2013; Smith et al., 2020; WCCI, 2025; World Economic Forum, 2022; Wright, 2021; Zava Ranch, 2023.

Methodology

This paper aims to illustrate the current situation of environmentally sustainable agriculture in Hungary, focusing on permaculture as an innovative practice that is increasingly gaining traction in the country. Examples of successful sustainable agriculture in Hungary may inspire similar adaptations in other countries, thereby promoting the broader spread of climate-conscious and environmentally friendly food production. The paper addresses how farmers define permaculture in Hungary, the benefits this farming method offers, and ways to encourage its wider adoption throughout the country.

To achieve this goal, the paper uses primary and secondary data. The primary data for this study was collected through in-depth interviews with four permaculture farmers in Hungary in November 2023. These farmers were selected from the Hungarian Permaculture Association's map database, which is the main organization representing permaculture farmers in Hungary. Among the interviewees, one is a full-time farmer, while the others are part-time permaculture practitioners. When selecting participants for the in-depth interviews, it was essential to include individuals from various regions of Hungary, specifically those whose permaculture farms are located in urban areas or agglomerations. Diversity was also a key factor regarding the size of the farms and their establishment dates. This included both new initiatives, such as the permaculture garden in Kunsziget, and farms that have been operational for at least ten years, like those in Törökbálint, Seregélyes, and Sokorópátka. Additionally, the farms vary in their farming objectives. For example, the farm in Törökbálint engages in commodity production, whereas the other three farms focus on achieving self-sufficiency for their families. The selected farms also differ in terms of the types of products they cultivate. In Törökbálint, Sokorópátka, and Seregélyes, livestock is integrated into their permaculture systems, while Kunsziget currently focuses exclusively on growing vegetables using a permaculture

approach. The interviews took the form of online discussions and covered the interviewee's definition of permaculture, how long they have been involved in it, what sources they use to learn about it, how they practice permaculture, and how they see the opportunities and obstacles to its spread.

In addition, monthly observations and knowledge-sharing took place at the Pannonhalma Permaculture Club (PAPEK) events for a year. These were occasional 3-hour meetings, where usually 10–12 people with a permaculture garden or farm could share their practical experience in person. Furthermore, four visits to permaculture and community gardens in urban agglomerations (near the city of Győr) supported the work, observing the practical side of this form of farming. As for secondary data, a review of relevant national and international literature on the topic supported the work.

Permaculture in Hungary: Benefits, Brief History and Main Characteristics

As far as permaculture and its benefits are concerned, it can be defined as an umbrella term that describes a broad range of practices and systems to optimize the interactions between the soil and plant systems. It efficiently utilizes various ecological functionalities to maximize ecosystem health and provide a broad suite of ecosystem services (Didarali & Gambiza, 2019; McLennon et al., 2021). These can be considered as environmental benefits. Besides this, there are also economic and social benefits to this form of farming. Economic benefits come from the potential for local job creation, lower food costs for residents, and reduced maintenance costs for green spaces. Last but not least, permaculture has social benefits as well. It can improve the mental health and well-being of the community and provide educational opportunities, and support community engagement, such as by thinking about the increasingly popular permaculture community gardens.

As far as the brief history is concerned, the first trials of Hungarian permaculture started in the 1990s. At this time, the first Hungarian ecovillage, "Gyűrűfű," was created by a group of young Hungarian ecologists who dreamed of having a large plot of land protected by permaculture (Domingos, 2018). In 1994, this ecovillage became one of the locations of Hungary's first permaculture design course (Gyurufu.net, 2024). A grassroots initiative started in 2006 to promote permaculture in Hungary by enthusiastic practitioners. After 10 years, the Hungarian Permaculture Association (MAPER) has been established (Centeri et al., 2021) to introduce permaculture to even more people, organize permaculture education, and build relationships with permaculture organizations from other countries. The work teams of the association cover a wide spectrum of activities, including research, design, and education, as well as managing a club in Budapest (Hungarian Permaculture Association, 2024).

The professional community has developed enormously in Hungary in the last few years. Every year, more and more training courses, clubs, groups, and professional organizations are being set up, and more and more Hungarian literature on the subject is available. In addition, the number of permaculture designers and services is growing (Szabó, 2024). Permaculture design courses (PDCs) are offered by various organizations and individuals in Hungary. Moreover, some universities (like the Hungarian University of Agriculture and Life Sciences) are incorporating permaculture principles into their educational programs or providing one-day courses, which helps introduce permaculture concepts to a wider audience (Gál et al., 2022).

All in all, today, in Hungary, there is a wide variety of initiatives related to alternative, sustainable, environmentally friendly agriculture and food production in the fields of agricultural practice, distribution, agricultural research, and higher education, but these activities are fragmented and disjointed (Balázs et al., 2020). A map database about permaculture farms, households, and services in Hungary created by the Hungarian Permaculture Association (MAPER) currently presents 49 projects (01.08.2024). Based on this database, the period of 2011–2020 was the peak in terms of permaculture farm creation, with almost 60% of the farms registered so far. The establishment of the Hungarian Permaculture Association, which started to register this type of initiative and spread permaculture farming more widely, probably played a role in reaching this peak (Fig. 1).

These farms cover 354,9 hectares (3,5 km^2), with 175 hectares occupied by the Gyűrűfű ecovillage, which is one of the first permaculture initiatives in Hungary. More than half of the farms are less than one hectare, and almost one-third are between one and 5 hectares. The permaculture approach can also be applied to larger plot sizes, over 15 hectares, and three examples are included in the Hungarian Permaculture Association's database (Figs. 2, 3).

Key Findings From In-depth Interviews with Permaculture Farmers in Hungary

Three of the four permaculture farmers (in Törökbálint, Seregélyes, and Sokorópátka) selected for the in-depth interviews in Hungary have been using this type of farming for more than ten years and have also obtained a permaculture design qualification (PDC), while one farmer (in Kunsziget) has been learning the method for three years and plans to continue practicing it in the future. In-depth interviews with four permaculture farmers can help answer the question of whether there are differences between the international literature and the Hungarian approach to permaculture. On this question, we see that the respondents have indeed reinterpreted Mollison's approach, developing their own vision and preference system for permaculture. According to one farmer in Western Hungary, permaculture can be defined as "an artificially engineered, chemical-free, sustainable ecosystem where

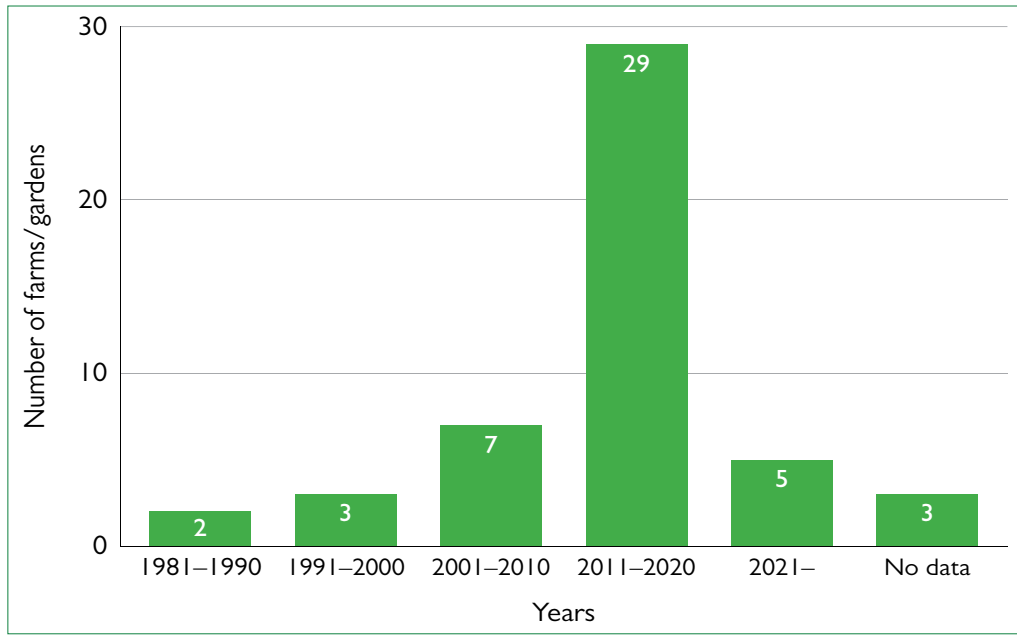

Figure 2. The year of creation of permaculture farms, households and services based on the Hungarian Permaculture Association's database (N=49).

Edited by author based on Hungarian Permaculture Association's map database, 2024.

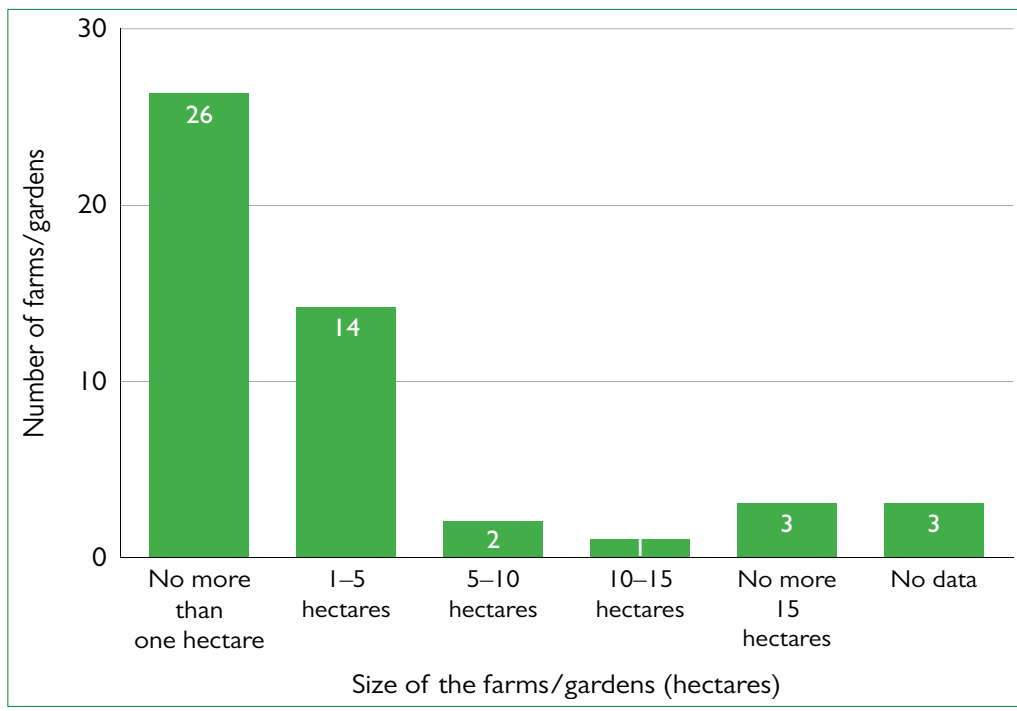

Figure 3. Plot size of permaculture farms, households and services based on the Hungarian Permaculture Association's database (N=49) (2024).

Edited by author based on Hungarian Permaculture Association's map database, 2024.

small- and large-scale ecosystems are best compatible with each other, both in terms of soil life and plant and animal communities. The aim is to maintain this balance in the long term." Another farmer defines permaculture as "sustainable agriculture itself, a kind of green initiative in which we try to create a state close to nature, where man is part of nature and not exploiting it. The aim is to find a natural balance between society and the environment."

Furthermore, the interviewee, who has a farm in the Budapest agglomeration (in Törökbálint), emphasized the importance of local communities. According to his approach, "permaculture is a systemic planning method based on ethical principles that aims to create well-functioning local communities in harmony with nature." Another farmer in Western Hungary interpreted permaculture as a "complex approach to life that goes far beyond gardens and farms," as he considers the use of permaculture techniques in harmony with nature as part of everyday life. It therefore requires a multidisciplinary approach, beyond the agroecological aspects of previous studies.

The interviewees' responses were consistent in that they were looking for new ways and innovative solutions to produce healthier food and greater self-sufficiency while doubting the methods of industrial agriculture in the development of permaculture and in planning their gardens or farms. One of them now sells his produce locally, and three of them grow vegetables, fruit, herbs, and livestock for their own families. When asked about their primary sources of information when it comes to the development of their permaculture economy, all of them pointed out that there are excellent books on the subject, and they also mentioned online platforms, professional support available within the Hungarian Permaculture Association, the internal library, and personal contacts as important sources of information.

To investigate the spatial spread of permaculture, the in-depth interview asked whether the interviewees' acquaintances, relatives, friends, or the local population were interested in this form of farming, or whether there were examples of people who had started permaculture in their locality or the wider community as a result of the interviewee. In this respect, an important finding of the interviewees is that there is still a high level of misunderstanding about permaculture. There is some interest and questions from people living in the environment, but no breakthroughs can be observed as a result of the permaculture farmer's approach and knowledge transfer activities. In the case of one settlement, the permaculture farmer saw the lack of community life and social contacts as the main reason for this, while others explained that it takes time and that society needs to mature.

One important way of promoting permaculture is for farmers to offer individual or group visits to their gardens. There are examples of both types among the respondents. The age of visitors is quite heterogeneous. The age of individual visitors varies between 30 and 70 years. The farm in Budapest agglomeration does not receive individual visitors but regularly welcomes groups from kindergartens and schools for educational purposes. In addition, there is a large group of people over 60 who also visit the farm in an organised way. Their motivation is typically to overcome the challenges of declining health by learning new farming techniques.

Overall, based on the experiences of the in-depth interviews and the observations, it can be said that, despite the high level of misunderstanding, there is a segment of the population that is receptive to this innovation, but it will take a long time before either permaculture or other forms of nature-based farming can become more widespread in Hungary.

Discussion and Conclusion

The demand for clean, chemical-free food has grown worldwide. The different forms of nature-based agriculture provide an opportunity to address these needs and foster community participation. Permaculture, the specific form examined in this study, is noteworthy for its adaptability, as, based on the Hungarian Permaculture Association's database, it can be implemented in small gardens, large farms, and in rural and urban areas as well. In Hungary, the adoption of permaculture principles dates back to the 1990s, gaining popularity after 2010. The main motivations of the interviewed permaculture farmers are the more extreme conditions and access to clean and healthy food. Many initiatives, such as professional organisations (e.g., Hungarian Permaculture Association), educational institutions (e.g., a biogarden in permaculture approach at the Hungarian University of Agriculture and Life Sciences), and the activities of local groups (e.g., Pannonhalma Permaculture Club) have emerged to support individual or community-based food self-sufficiency and exchanges in Hungary. However, these efforts are currently relatively isolated across the country, with limited knowledge sharing. To fully leverage knowledge sharing and sustainable food production opportunities, there is a need for a well-organized national or even international network to bring together all such initiatives in the future, encompassing not only permaculture initiatives but also all existing forms of sustainable food production.

In summary, we can see that different forms of nature-based agriculture are increasingly gaining ground over traditional agriculture. Looking at permaculture farming critically, its acceptance in social contexts can vary. This lack of widespread acceptance may sometimes result in conflicts with neighbours, particularly concerning aspects like unmown lawns and what may be perceived as a disordered appearance in permaculture gardens. Such misunderstandings can arise from unfamiliarity with permaculture practices and principles. From an economic standpoint, while some permaculture farms successfully produce crops for sale, their yields can be less predictable when compared to those from standardized monocropping organic farms. Furthermore, the mechanization processes used in permaculture tend to be more complex and challenging than those utilized in conventional organic farming, which can impact operational efficiency.

The above findings, especially the high level of misunderstanding, were confirmed by the in-depth interviews conducted during the research, which could be promoted by informing local society, transferring knowledge to them, and strengthening social contacts and cooperation between professional organisations in the future.

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Planlama 2025;Supp(1):134–137 | doi: 10.14744/planlama.2024.85866

OPINION / GÖRÜŞ

Relationships Between Agri-food Systems and Cities: Exploring Synergies and Trade-offs

Tarımsal Gıda Sistemleri ve Şehirler Arasındaki İlişkiler: Sinerjileri ve Değiş Tokuşları Keşfetmek

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Introduction

Urbanization stands as a noteworthy worldwide phenomenon. The global trend of urbanization is advancing rapidly; indeed, the rural populace has expanded at a low rate while the urban populace has surged significantly. The urban population share has doubled from 25% in 1950 to approximately 50% in 2020. Urbanization is expected to continue to increase over the next three decades, with the urban population projected to rise from 56% in 2021 to 68% in 2050. This means there will be an additional 2.2 billion urban residents by 2050, primarily in Africa and Asia (UN-Habitat, 2022). This trend suggests that the direction of humanity and its impact on the planet will largely be determined by what occurs in cities. Consequently, cities are being called upon to play a pivotal role in pursuing sustainable development.

Urban sustainability remains a crucial subject because of the strategic significance of urban systems and their considerable potential and challenges in relation to sustainability (Allen et al., 2002; Castán Broto et al., 2019). Despite this, many efforts to promote urban sustainability tend to overlook the essential role of agriculture in urban areas. This raises concerns about the limited consideration of food production in sustainable urban development. The "brown" aspect of urban sustainability prioritizes human well-being, social equity, and urban development that benefits the poor. The "green" aspect focuses on environmental well-being, preservation of ecosystems, and the ecological effects of urban systems (Allen et al., 2002).

Urbanization offers both opportunities and challenges from socio-economic and environmental perspectives. Orsini et al. (2013) posit that "*In many developing countries, the urbanization process goes along with increasing urban poverty and polluted environment, growing food insecurity and malnutrition, especially for children, pregnant and lactating women; and increasing unemployment*" (p. 695). In addition, urbanization brings about further difficulties in managing food systems and ensuring food security. Hence, alternative approaches are necessary to guarantee food and nutrition security sustainably. Urban and peri-urban agriculture (UPA) is often cited as one of these alternatives.

A growing body of research focuses on urban food systems and their shift towards sustainability (Moragues-Faus & Sonnino, 2019; Smaal et al., 2020). Nevertheless, Doernberg et al. (2019) reveal that "*urban food policy activities are still highly fragmented and frequently stem from individual initiatives*," and there is a lack of "*comprehensive urban food policies and their enactment through urban food strategies*". Municipal actors' capacities for policy implementation are restricted due to a shortage of

Received: 07.09.2024 Revised: 09.09.2024
Accepted: 17.09.2024 Available online date: 13.01.2025
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TMMOB Şehir Plancıları Odası

financial and staffing resources. Most research on urban food systems concentrates on developed and industrialized countries. The scrutinized policies and policy documents cover topics such as food and nutrition security, sustainable and healthy diets, non-communicable diseases, biodiversity, and organic farming. Special emphasis is also placed on the connections between sustainability transitions in agri-food systems and achieving the Sustainable Development Goals (SDGs), particularly SDG 2, "Zero Hunger" (El Bilali et al., 2021).

Within this framework, the current opinion provides insight into the various connections between agri-food and cities from a sustainability perspective. Initially, the article presents UPA and examines its multidimensional advantages. Subsequently, it delves into the relationships between agri-food systems and SDG 11, "Sustainable Cities and Communities". Then, the article explores the vital role of urban planning and governance in determining cities' sustainability and shaping the transition towards sustainable systems.

Urban and peri-urban agriculture (UPA): Definition, Inclusion in Global Agendas, Benefits and Challenges

UPA has been defined in different ways (FAO et al., 2022; UNDP, 1996). According to FAO et al. (2022), "*Urban and peri-urban agriculture (UPA) can be defined as practices that yield food and other outputs through agricultural production and related processes (transformation, distribution, marketing, recycling…), taking place on land and other spaces within cities and surrounding regions*." (p. 11). UPA includes horticulture, animal husbandry, aquaculture, and other endeavors to generate food and agricultural products within urban areas and their surroundings. UPA covers all individuals, organizations, undertakings, locations, and economic activities focused on production in urban and peri-urban areas, their positive effects on the environment and society, and the mutual benefits they create (Skar et al., 2020).

Numerous global sustainable development initiatives have focused on UPA, such as the SDGs, the New Urban Agenda (NUA), and the Milan Urban Food Policy Pact (MUFPP). The 2030 Agenda for Sustainable Development (United Nations, 2015), with its core of 17 SDGs, aims to eradicate poverty, preserve the planet, and ensure prosperity for both developing and developed countries. One of the SDGs, SDG 11, targets explicitly sustainable development in cities and communities by making them inclusive, safe, resilient, and sustainable. The NUA, endorsed on October 20, 2016, at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, establishes new global standards for planning, managing, and living sustainably in cities (United Nations, 2017). It includes various mentions of urban agriculture and is closely intertwined with the SDGs, with the NUA serving to fulfill the SDGs in urban areas. The MUFFP, signed by over 100 cities in October 2015 in Milan during EXPO 2015 (MUFPP, 2020), is a non-binding agreement on urban food policies. The MUFFP Framework for Action has identified different work streams, including food production.

Numerous studies have indicated that UPA can address various challenges, such as food insecurity, poverty, malnutrition, and health issues (Orsini et al., 2013; Zezza & Tasciotti, 2010). Orsini et al. (2013) highlight that UPA offers a range of environmental, social, and economic advantages. Indeed, it contributes to food security, livelihoods, income generation, social inclusion, gender equity, waste reduction, biodiversity conservation, and air quality, as well as decreasing environmental impacts related to food transportation and storage. However, the advancement of UPA faces numerous constraints, particularly in developing countries. These include inadequate government support, restricted market access, land tenure insecurity, limited access to productive resources, and issues related to inequality (Houessou et al., 2020).

Agri-food and SDG 11 "Sustainable Cities and Communities": Synergies and Trade-Offs

SDG 11 aims to make cities inclusive, safe, resilient, and sustainable. The rationale behind SDG 11 is that since the global population is steadily growing, it is imperative to construct eco-friendly urban areas to house everyone. To ensure the well-being and success of all individuals, innovative urban design is essential, fostering secure, budget-friendly, and adaptable cities with environmentally friendly and culturally enriching living environments. SDG 11 encompasses 10 targets (Table 1).

While UPA does not contribute directly to *safe and affordable housing* (T11.1), the way land is managed and used can affect housing. Indeed, there might be trade-offs between agriculture and housing: housing (and urbanization) can reduce the land available for agriculture and vice-versa. Therefore, it is crucial to have adequate planning to maintain a balance between the different land uses.

UPA does not contribute directly to *affordable and sustainable transport systems* (T11.2). Still, promoting short supply chains can reduce transport needs, consequently mitigating greenhouse gas emissions. Once again, the use of land to develop the transport network might be at the expense of the space dedicated to UPA.

Inclusive and sustainable urbanization (T11.3) implies an appropriate use of land and space in cities. UPA can contribute to better city planning and improve cities' sustainability and inclusiveness. Indeed, UPA contributes to environmental, social, and economic sustainability. It also promotes participatory processes for land use and management and inclusiveness by strengthening the social fabric/capital. Therefore, UPA can play a role in *policies for inclusion* (T11.9).

Table 1. Targets of SDG 11 "Sustainable cities and communities"

Target (T) number	Target focus
T11.1	Safe and affordable housing
T11.2	Affordable and sustainable transport systems
T11.3	Inclusive and sustainable urbanization
T11.4	Protecting the world's cultural and natural heritage
T11.5	Reducing the adverse effects of natural disasters
T11.6	Reducing the environmental impact of cities
T11.7	Providing access to safe and inclusive green and public spaces
T11.8	Strong national and regional development planning
T11.9	Implementing policies for inclusion, resource efficiency and disaster risk reduction
T11.a	Supporting least developed countries in sustainable and resilient building

Source: The Global Goals (2020). SDG: Sustainable Development Goal.

The protection of cultural and natural heritage (T11.4) in cities cannot be dissociated from UPA and how it is managed. Indeed, many natural heritage sites are de facto agricultural ones. Furthermore, how UPA is managed, and its level of intensification and sustainability determines its externalities that can affect natural capital and heritage.

Urban and peri-urban farmers are important managers of land in cities, and the way they do that can affect the incidence and the *adverse effects of natural disasters* (T11.5). Indeed, UPA can affect the occurrence of natural disasters such as fires and also mitigate the impacts of water-related disasters such as floods. Therefore, UPA can also be included in strategies aiming at *disaster risk reduction* (T11.9).

UPA can contribute to reducing the *environmental impact of cities* (T11.6) and improving *resource efficiency* (T11.9). UPA, and its ecosystemic and ecological services, can enhance the quality of air and the circularity of waste management. It can positively impact environmental health by affecting the atmosphere, water, land/soil, biodiversity, materials and energy. It influences GHG emissions and, as a result, climate change. It also has implications for water resources, impacting water usage and quality. UPA has connections to biodiversity, affecting species diversity, genetic diversity, and ecosystem and landscape diversity, which in turn affects the provision of ecosystem services. It also impacts land management and soil fertility. Furthermore, UPA plays a critical role in material and nutrient cycles; it contributes to the reuse and valorization of by-products and waste (e.g., compost).

UPA also provides urban dwellers with *access to green spaces* (T11.7). This is particularly true when agricultural activities are combined with tourism (e.g., agritourism farms). Some urban farms also serve as educational farms, thus providing children with a space for learning and close contact with nature. Agritourism farms and educational farms also often favor the inclusion of women, elders and persons with disabilities.

UPA can serve as a tool and laboratory to strengthen *development planning* (T11.8) at national and regional levels. Indeed, it pushes to adopt a holistic and integrated approach towards multifunctional land use and zoning that considers the different economic sectors and aspirations of urban dwellers. UPA also helps to strengthen support linkages between urban, peri-urban and rural areas within regional and territorial food systems thus fostering regional development planning.

The high pace of urbanization suggests *support to developing and least developed countries* (T11.a) is highly needed. UPA can be one of the sectors where such support, through financial and technical assistance, is provided to build sustainability and resilience within cities. This has already been done in some initiatives, such as the MUFPP.

The Centrality of Urban Planning in the Quest For Sustainability

UPA has the potential to contribute to urban sustainability by, among others, enhancing waste management, improving energy efficiency, and aiding in the preservation of natural and agricultural biodiversity. Nevertheless, there are potential concerns related to health, safety, and environmental pollution arising from intensive UPA models. In this regard, it is essential to establish suitable local governance, institutional framework, enduring policies, and cohesive strategic perspectives at the local level to mitigate any adverse impacts of UPA while maintaining its socio-economic benefits.

Different factors related to politics and governance impact the development of UPA. The diverse urbanization patterns pose significant challenges for urban decision-makers and planners, indicating the need for various governance mechanisms to ensure sustainable urban development without compromising UPA spaces while addressing the associated challenges. UPA has evolved into a socio-political platform involving multiple

stakeholders with differing interests, stakes, and sources of power and legitimacy, leading to multiple governance processes shaped through formal or informal negotiations. The ambiguous legal status of UPA contrasts with the involvement of diverse actors in its promotion, demonstrating its societal and economic value. The multifaceted nature of UPA positions it as a valuable instrument for local policy and planning. Municipal governments are leveraging UPA in policy development, providing an avenue to address comprehensive, sustainable urban management. However, limited knowledge among public authorities about UPA hinders its integration into public policies. Additionally, although public authorities are increasingly interested in UPA, this interest has not always translated into effective incorporation of UPA into institutional and legal frameworks. Coordination challenges between various government sectors and levels, along with insufficient functional complementarity among sectors, impede the progress of UPA.

Conclusion

Cities are called to play a central role in the transition towards sustainable and resilient food systems in developed and developing countries alike. This can be done, among others, by promoting UPA in order to benefit from its environmental, social, and economic advantages for cities and their dwellers. Indeed, UPA can support sustainable food production, procurement, and consumption within cities as well as sustainable waste management and circularity. UPA can assist impoverished and marginalized communities, guarantee food security, and promote sustainable livelihoods within urban areas. It also has the potential to enhance waste management, improve energy efficiency, and contribute to preserving natural and agricultural biodiversity. However, intensive UPA models may give rise to concerns related to health, safety, and environmental pollution. Therefore, it is crucial to establish suitable local governance, institutional framework, long-term policies, and coherent strategic visions to mitigate any adverse impacts of UPA while upholding its socio-economic importance. Lastly, while the diverse benefits of UPA are widely acknowledged, various measures must be undertaken to unlock its potential. Specifically, addressing socio-cultural, environmental, and technological barriers that hinder its growth and persistence, and establishing a supportive policy and regulatory framework for UPA are of utmost importance. In particular, unlocking the potential of UPA and its contribution to urban sustainability and SDG 11 implies, inter alia, changes in strategies and policies as well as legal and legislative documents to create a favorable and enabling environment for inclusive approaches and grassroots initiatives aiming at promoting agriculture within cities. Similarly, urban planning should evolve in such a way as to emphasize agroecological urbanism, urban farming, and participatory and inclusive decision-making processes for planning and zoning while promoting functional linkages between cities and rural areas within city-region food systems.

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Planlama 2025;Supp(1):138–142 | doi: 10.14744/planlama.2024.92499

OPINION / GÖRÜŞ

Addressing Fragmentation in City-led Food System Strategies: Insights from the Fusilli Project

Şehir Liderliğindeki Gıda Sistemi Stratejilerinde Parçalanmanın Ele Alınması: FUSILLI Projesinden İçgörüler

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Introduction

The urgency to transform urban food systems stems from global challenges like rapid urbanization, climate change, food insecurity, and social inequality – complex issues termed "wicked problems". With over half of the world's population now in urban areas and cities continuing to expand (UN, n.d.-b), urban centers are projected to consume substantial resources, including food. Food systems contribute around one-third of anthropogenic greenhouse gas emissions (IPCC, 2023), and causing major environmental issues destabilizing planetary boundaries (Campbell et al., 2017). These environmental impacts highlight the necessity for cities to lead transformative changes within the food sector.

The EU Horizon-funded FUSILLI Project addresses this issue by positioning cities as key agents for sustainable urban food system transitions (CORDIS, 2020). Although cities have been recognized as potential agents of positive change in previous research and initiatives, comprehensive methodologies engaging city actors are still lacking. Structured approaches, such as FUSILLI Project outcomes, are essential to help cities design and implement effective food policies that align with climate adaptation and sustainability goals.

Cities' involvement in food systems is fragmented, with responsibilities spread across municipal departments, making a unified approach difficult. Limited resources and a reluctance to take leadership further hinder collaboration. These challenges highlight the need for cities to embrace their complex role and overcome barriers to transformative change. Despite uncertainties around cities' roles in the food system, they indeed are key players in driving the transformation towards sustainable urban food systems (Magarini & Porreca, 2019). This role can be understood through dimensions of policy and planning, acting as innovation hubs, forming partnerships and networks, and engaging citizens. This letter addresses the challenges cities face beyond the "low-hanging fruits" of climate action as they strive to meet carbon neutrality targets, sustainable development goals (SDGs) (UN, n.d.-a) while keeping transition just and fair (Kaljonen et al., 2020).

Drawing from the FUSILLI Project Knowledge Community activities in Southern Finland, this letter offers actionable strategies from a Nordic perspective and thus contributes to urban food planning literature. Although the characteristics of cities – ranging from readiness in food system strategies, rural-urban linkages, population and geography to political

Received: 30.09.2024 Revised: 01.10.2024
Accepted: 17.10.2024 Available online date: 20.02.2025
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TMMOB Şehir Plancıları Odası

contexts – vary, our findings offer relevant implications for advancing urban food systems transformation.

Dialogue and Translocal Learning Engaging Cities Driving Food System Change

The FUSILLI Project facilitated workshops to engage representatives from city-related organizations to address the barriers to sustainable food systems. These workshops brought City of Tampere (a FUSILLI partner city) together with representatives from other Finnish cities and city-owned organizations. The workshops were part of the FUSILLI Knowledge Community, which aims to disseminate best practices and empower food system actors to innovate and develop long-term urban food planning strategies.

Workshop participants, primarily involved in climate and environmental roles, faced a shared challenge: Finnish cities have limited control over the agri-food system, often relying on project-based approaches rather than direct governance. Pre-workshop interviews were conducted to identify key questions and stimulate critical thinking on urban food system transformation. A central question emerged: *How can cities drive food system change when their role is unclear?* This question served as the foundation for further discussions and reflections during the workshops.

Policy and Planning

Urban food systems are complex, with unclear responsibilities often leading to avoidance by city organizations. Food-related challenges span multiple city service units, making integration into strategic plans essential for effective management. Without clear policies, food system efforts become fragmented, reliant on individual leadership for progress.

Through the FUSILLI Project, City of Tampere began mapping its role in urban food system transformation by reviewing strategies and programmes related to food. While food is not explicitly mentioned in the city strategy, Tampere has action plans and programmes that overlap with food system sustainability. These action plans and programmes are a derivative of the Tampere City Strategy and contain concrete measures to promote sustainable food transformation. These action plans and programmes are: Climate Neutral Tampere 2030 roadmap (City of Tampere, 2022b), Carbon neutral actions' development programme (City of Tampere, 2024d) Circular Economy Plan (City of Tampere, 2024c), Poverty Plan (City of Tampere, 2023b), Child and Youth Welfare Plan (City of Tampere, n.d.) and Pirkanmaan Voimia Ltd. (city-owned in-house food service company) Environmental roadmap (Pirkanmaan Voimia Ltd., n.d.). FUSILLI Project implemented concrete food-related pilots and activities to the action plans and programmes. These activities introduced connections to food system to different city units and responsibilities.

Tampere has pioneered accounting for consumption-based emissions, with food contributing 23% of the city's emissions (City of Tampere, 2024b). However, a key barrier remains the exclusion of consumption-based emissions from cities' CO^2 neutrality targets. Cities need to adopt systems thinking and include food production and consumption in their climate policies, emphasizing CO^2 footprints, biodiversity impacts, and social responsibility.

Finnish cities face challenges due to limited control over the agri-food system and retail, which are mainly managed by private businesses. As citizens' food consumption is viewed as a private choice, municipal control is largely limited to public food services. Municipal involvement in public food services has weakened with recent reforms, such as transferring social and healthcare services to wellbeing service counties, further distancing cities from local food agendas. Additionally, Finland's centralized food system (Karttunen et al., 2019) reduces cities' influence over the food consumed locally, as much of it is sourced from outside the region.

Within FUSILLI, Tampere has identified its role in urban food planning across all the city-units and operations. As a result, the city has been recognized as urban food planning actor in multiple areas such as land use (urban gardening; residents' connection to nature), health and well-being (park meals for children), and public services (food education in schools and early childhood care), subsidiaries (procurement practices of public meal services) as well as expert organization for tourism, events and congresses (food as a part of experience economy). However, some food-related responsibilities are often fragmented, such as in food aid, complicating coordination.

Reviewing strategic management system of the city thoroughly is one of best practices recognized. Developing a food culture strategy is another key opportunity, but – at least in Finnish context – such strategies are still rare and often lack clear direction.

Innovation Hubs

Innovation hubs, living labs and other participatory infrastructures play a pivotal role in transforming urban food systems by fostering collaboration among diverse stakeholders. City living labs have been a core of the FUSILLI Project, driving innovation in urban food systems. These labs provide experimental environments where cities can test new ideas, technologies, and policies in real-time. Labs engage various stakeholders –government, businesses, researchers, citizens, and environmental representatives – to co-create and test solutions in real-world settings (ENoLL, 2017). When setting up city-led structures for innovation, the natural environment should be treated as a stakeholder to recognize the value of natural capital (Mäkelä et al., 2019; Pelenc et al., n.d.).

Living labs generate practical insights that can inform city planning and food system transformation. Cities must acknowledge their value in addressing complex challenges like climate change and social equity, enhancing residents' quality of life. Investing in sustainable innovation infrastructure is crucial for their continuity and ensuring that data from these experiments will be integrated into decision-making processes.

In Finland, a centralized food system dominated by two major retail operators creates an imbalance, limiting consumer choice (Kallio & Houtbeckers, 2022). While small and medium-sized enterprises (SMEs) exist within the food system, alternative food networks remain niche, and SMEs struggle to scale and compete.

A significant barrier for SMEs identified in Knowledge Exchange Workshops is the rigid structure of marketplace contracts, typically favoring larger businesses. SMEs engaged in part-time or small-scale production often find long-term contracts challenging. Participants emphasized the need for more adaptable terms to accommodate smaller operators, enhancing their access to urban marketplaces and fostering local food innovation.

Urban development plans should include infrastructure for small food operators, enabling alternative food networks and urban food hubs to thrive. This proactive approach promotes entrepreneurship and increases the availability of locally produced, sustainable food.

Urban food system transformation requires not just financial resources but also a focus on food literacy and reconnection to nature. Innovation may flourish via urban food hubs, alternative food systems like community-supported agriculture, and urban gardening initiatives. Educational initiatives, such as school garden visits, can strengthen urban populations' connection to sustainable food systems.

Partnerships and Networks

One key policy recommendation that emerged from FUSILLI Project and was emphasised in the workshop is Milan Urban Food Policy Pact (MUFPP) which City of Tampere (Tampere Signs the MUFPP, 2024) and other FUSILLI Cities have recently signed. MUFPP is an international framework, designed to support sustainable food systems in urban areas. By signing the MUFPP, city leaders and officials would have a concrete tool for ensuring long-term urban food system transformation beyond the lifespan of the projects and election cycles. This document is essential for maintaining momentum and continuing the conversation about food systems, regardless of political changes. In addition, MUFPP encourages stakeholders of the cities to participate in food system sustainability transformation.

Apart from MUFPP, there are indeed other significant networks and commitments, in which food is related in different ways. To promote bringing food system sustainability theme to city agenda mapping of existing memberships and commitments is useful. For example, FUSILLI City Tampere is committed to Climate City Contract (City of Tampere, 2024a), Sustainable Development Goals (SDGs) (City of Tampere, 2022a) and declared as a Fair Trade City (City of Tampere, 2022c). When the Cities are considering taking part to new networks and commitments in terms of food system sustainability, we recommended to choose initiatives, which succeed in engaging as versatile selection of city units and operations as possible.

Citizen Engagement

Citizen engagement is crucial for urban food system transformation, fostering public awareness, accountability, and support for sustainable policies while empowering residents to shape local food environments. We encourage exploring initiatives that ensure food system interventions are inclusive and responsive to urban populations' diverse needs.

Cities cannot transform their food systems by isolating food as an issue. Even if food is not explicitly mentioned in city strategies, it should be integrated across all responsible sectors due to its deep connections with urban wellbeing. For instance, the driving force behind food system transformation may be the quality of life that food enhances. Workshop participants highlighted that communality, wellbeing, and informal volunteering –the fourth sector (Rask et al., 2020) – are fundamental to a fulfilling living. Cities need to preserve urban spaces free from consumerism. Examples include the role of school meals improving learning outcomes, social dining promoting community cohesion, park lunches reducing inequality, and urban gardening fostering a connection to nature. These examples illustrate the importance of embedding food considerations into urban policies and programs, allowing food to act as a catalyst for positive social, environmental, and economic outcomes.

Transitioning to a sustainable society requires individuals to embrace new roles, as illustrated by prosumerism, where citizens participate in both consumption and production across sectors and knowledge building (Khan & Speed, 2019). Urban gardening exemplifies prosumerism, connecting citizens to food production while enhancing urban livability and nurtures connections between rural-urban linkages. City organizations can play a pivotal role in enabling new value creation in future food systems.

The Nordic countries' developed education systems, high civic literacy, and flat social hierarchies create a framework conducive to extensive citizen engagement (Koskimaa et al., 2024; Kangas & Kvist, 2019). Related to strategic goals of

the City of Tampere, the Participation and Community Involvement Plan (City of Tampere, 2023a) implementation supports community-based actions and the city to act as trusted partner for different communities.

Discussion

Food intersects with multiple city services, units and subsidiary companies, requiring systemic thinking and integrated action. Public food services, urban planning, education, social care, and environmental services all play roles in advancing food system goals. To foster this shared vision, cities need to establish platforms for dialogue and co-development between government, residents, and businesses. Innovation hubs and city living labs were highlighted as important tools for creating trust and aligning objectives.

Knowledge Exchange workshop participants also warned of the cost of inaction, noting that delaying sustainable solutions due to high initial costs would lead to far greater long-term financial, social, and environmental consequences. Recent literature supports this view, stressing that early investment in sustainability yields long-term benefits, enhancing resilience and reducing future crisis costs (Dreyer, 2024; OECD, 2008). Financial barriers must be overcome to avoid escalating public health and food security issues in the future.

Further research is needed on cross-sector collaboration models and how city departments can integrate food system thinking into their policies. Additionally, there is a need to investigate how businesses, especially SMEs, can be encouraged to engage in sustainable food practices. Regional development organizations must coordinate efforts to bridge rural-urban linkages, creating business opportunities and strengthening local food systems. Cities can leverage insights from academic research and collaborations to build more inclusive networks that drive food system transformation.

Participants expressed strong inner motivation to work towards sustainable urban food systems, driven by a vision of livable cities. They felt a responsibility to contribute using their skills and networks. The politicized nature of the food system question in the Finnish context (Niemi, 2024) makes dialogue and innovative solutions even more crucial. As one participant noted, "Current unsustainable practices must change very soon, which is kind of comforting." There is a sense that food system transformation is gaining momentum, with the right time for action approaching.

Conclusion

The workshop underscored the importance of multi-stakeholder collaboration, policy frameworks (such as MUFPP), and proactive investment in sustainability. Urban food systems are deeply complex, requiring cities to adopt long-term, system-based strategies that integrate food into broader agendas. Cities have a key role in supporting alternative food systems and short supply chains and must act as enablers rather than passive communicators.

Despite ambiguity in development pathways, the following actions are recommended for city agendas:

- Promote green transition: Map and prioritize food system actions within green transition strategies, contributing to planetary wellbeing.
- Enhance social welfare, address inequality: Strengthen efforts related to school food, food education, food aid, and community building, particularly in underserved areas.
- Leverage economic potential: Use food-related initiatives, such as gastronomy tourism, placemaking, and experience economy, to enhance city attractiveness.
- Facilitate knowledge exchange: Enable urban actors to share successful practices and policies, encouraging intercity cooperation and dialogue.

By taking these steps, cities can collectively advance towards more sustainable food systems that not only meet the needs of their residents but also contribute to broader environmental goals. The actions outlined above foster communities that are informed, engaged, and empowered to shape their food futures.

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Planlama 2025;Supp(1):143–146 | doi: 10.14744/planlama.2024.89814

OPINION / GÖRÜŞ

A Critical Perspective on Multilevel Governance and Policy Integration: Thematic Partnership on Food from the Urban Agenda for the EU

AB Şehir Gündemi'nden Gıda için Tematik Ortaklık: Çok Düzeyli Yönetişim ve Politika Entegrasyonuna Eleştirel bir Bakış

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Introduction

The need for coherent and integrative food policies across multiple governance levels in the European Union (EU) has become increasingly apparent. Despite decades of substantial reports and research from established specialists like IPES-Food, which highlighted systemic gaps and proposed comprehensive frameworks for food policy, there remains significant fragmentation and inefficiency in food governance. This article critically assesses the role of multilevel governance in food system resilience and the necessity for integrative policies that enable coordinated actions across various levels of government. We argue that the Thematic Partnership on Food, developed under the Urban Agenda for the EU, represents a crucial step towards addressing these challenges.

Critical Assessment of Multilevel Governance in the EU

Multilevel governance in the EU is characterised by its complexity and often incoherent policies, which hinder effective action on food system sustainability. The current governance structure involves numerous overlapping policies and regulations at the EU, national, and local levels, leading to misaligned objectives and reduced effectiveness. The IPES-Food 2019 report, "Toward a Common Food Policy," emphasized the urgency of creating a cohesive food policy framework that integrates various aspects of the food system, from production to consumption and waste management.

The Need for Integrated Food Policies

Integrated food policies are essential for enabling coordinated multilevel action. Such policies should encompass the entire food system, addressing production, distribution, consumption, and waste. They should also consider the environmental, social, and economic impacts of food production and consumption. By internalizing externalities and promoting sustainable practices, integrated food policies can ensure that market prices reflect the true cost of food production, including its environmental and social impacts.

Received: 30.07.2024 Revised: 17.09.2024
Accepted: 02.11.2024 Available online date: 13.03.2025
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Thematic Partnership on Food: A Response to Governance Challenges

The European Commission, through DG REGIO and the European Urban Initiative, launched the Thematic Partnership on Food as part of the Urban Agenda for the EU. This initiative, based on the ex-ante assessment conducted in 2023, aims to bridge the gaps identified in existing food governance structures. Despite the short period for the assessment, the wealth of documentation and previous research provided a solid foundation for identifying key areas of focus.

Short Assessment Period vs. Decades of Research

The ex-ante assessment period was notably brief. However, the substantial body of work from the past two decades, including critical reports from IPES-Food, provided invaluable insights. These documents highlighted the systemic issues within the EU food system and offered comprehensive recommendations for policy reform. The partnership draws on this extensive research to inform its strategies and actions.

Key Areas of Focus for the Thematic Partnership

The Thematic Partnership on Food focuses on several critical areas to enhance food system resilience and sustainability through improved governance:

1. Fragmented Policy Framework: Addressing the fragmentation in current food policies is paramount. The partnership advocates for an overarching policy framework that integrates various aspects of the food system, ensuring coherence and alignment across different policy areas.

2. Inclusion of Externalities: Implementing policies that internalize externalities in food pricing is crucial. By accounting for the true environmental and social costs of food production, these policies can promote more sustainable practices.

3. Food Justice and Access to Land: Integrating food justice into EU policies ensures equitable access to nutritious food for all populations. Additionally, improving access to land for sustainable food production is vital for supporting young and small-scale farmers.

4. Reducing Dependence on Global Supply Chains: Promoting decentralized and diversified local food systems can reduce the EU's reliance on global supply chains, enhancing food security and resilience to disruptions.

5. Enhancing Multi-Level Governance: Strengthening coordination and coherence between EU, national, and local policies through multi-level governance frameworks is essential. This involves establishing local food policy councils and city-region food systems that facilitate integrated and participatory approaches to food system transformation.

6. Supporting Effective Funding: Creating innovation funds for local food systems by collaborating with banks interested in green financing and NGOs can address funding gaps and support sustainable initiatives.

Participatory Approaches and Bottom-up Initiatives

Participatory approaches and the involvement of bottom-up initiatives are critical for the success of integrated food policies. Engaging local communities, farmers, and other stakeholders in the policymaking process ensures that policies are grounded in practical realities and address the needs of those directly affected by them.

Urban Food Commissions and Food Policy Councils

Urban Food Commissions and Food Policy Councils represent innovative mechanisms for participatory governance. These bodies bring together diverse stakeholders to collaborate on developing and implementing food policies. They provide a platform for integrating local knowledge and expertise into policy decisions, fostering a sense of ownership and commitment among community members.

Case Studies and Best Practices

The partnership leverages case studies and best practices from cities known for their progressive food policies. Cities like Milan, Lisbon, Mouans-Sartoux, Vitoria-Gasteiz, and Ghent offer valuable insights into successful governance models and policy interventions.

Milan Urban Food Policy Pact

The Milan Urban Food Policy Pact (MUFPP) exemplifies a comprehensive approach to urban food governance. It focuses on enhancing food security, promoting sustainable diets, and reducing food waste. The pact's emphasis on multi-stakeholder collaboration and policy coherence aligns with the objectives of the Thematic Partnership on Food.

Lisbon's Food Strategy

Lisbon's food strategy integrates various aspects of the food system, from urban agriculture to sustainable food procurement. The city's approach highlights the importance of localizing food systems and supporting small-scale producers. Lisbon's experience underscores the potential of city-led initiatives to drive systemic change.

Strategic Directions and Priorities

To address the identified governance challenges, the Thematic Partnership on Food has outlined several strategic directions and priorities:

1. Developing an Overarching Policy Framework: This framework should integrate various aspects of the food system, ensuring coherence and alignment across different policy areas.

2. Internalizing Externalities in Food Pricing: Policies should be implemented to internalize externalities, making sustainable practices more economically viable.

3. Promoting Food Justice and Improving Access to Land: EU policies should integrate food justice principles, ensuring equitable access to nutritious food and improving access to land for sustainable food production.

4. Reducing Dependence on Global Supply Chains: Promoting decentralized and diversified local food systems can reduce reliance on global supply chains, enhancing food security and resilience.

5. Enhancing Multi-Level Governance: Strengthening coordination and coherence between EU, national, and local policies through multi-level governance frameworks is essential.

6. Supporting Effective Funding: Creating innovation funds for local food systems by collaborating with banks interested in green financing and NGOs can address funding gaps and support sustainable initiatives.

Conclusion

The Thematic Partnership on Food under the Urban Agenda for the EU represents a critical step towards addressing the systemic governance challenges that hinder food system resilience and sustainability. By focusing on integrated food policies, participatory approaches, and multi-level governance, the partnership aims to create a coherent and effective framework for food system transformation. Drawing on decades of research and leveraging best practices from progressive cities, the partnership is well-positioned to drive meaningful change in the EU food system.

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Planlama 2025;Supp(1):147–152 | doi: 10.14744/planlama.2024.52386

OPINION / GÖRÜŞ

How Can Urban Planners in Türkiye Foster Stronger Connections with the Agricultural/Food Sector While Transitioning from Closed Plans to Open Plans?

Türkiye'deki Şehir Plancıları, Kapalı Plandan Açık Plana Geçiş Sürecinde Tarım/Gıda Sektörüyle Daha Güçlü Bağlantılar Nasıl Geliştirebilirler?

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1. Introduction

The Journal of Planning has decided to dedicate this special issue to Urban Food Planning, which I believe is a well-made decision. The guest editors asked me to write an article on this topic for the special issue, which I gladly accepted. One of the preconditions for the continued existence of a society is to ensure that all its members have access to sufficient and healthy food at affordable prices. This makes food planning tightly intertwined with the concept of the city. Historically, during the hunting and gathering stage of humanity's development, people were constantly moving across the earth to secure their food, sustaining their existence. Once humans began to form permanent settlements, arrangements were made to ensure the nutrition of these populations. Initially, people started agricultural production outside of the settled areas to maintain hunting practices (Hodder, 2012), diversified their food supply by domesticating animals, and thus began to sustain their lives.

Throughout the history, to feed urban population, it is necessary to transport agricultural products from where they were produced to the city. In a period when transportation relied on human or animal power and organic energy, land transport was too costly. The value of a product produced at a certain distance will be equal to the cost of transportation, beyond which distance, agricultural production would not contribute to feeding the city's population. Thus, the available transportation technology set the limit on how large a city's population could be at that time. In pre-industrial periods, the population size of land-based cities typically remained below 10,000.

In this early period, the city of Istanbul, with a population exceeding 300,000, could only exist due to its unique geographic location. To feed a city as large as Istanbul, food had to be brought from distant locations, which was only possible through sea transport. At this time, sea transportation was ten times cheaper than land transport. Therefore, the existence and sustainability of a city at the intersection of two seas, like Istanbul, were made possible. However, this was a highly critical relationship. The use of the term "provisionism" ("iaşecilik" in Turkish) to describe the institutional structure of the Ottoman economy is interesting

Received: 15.10.2024 Accepted: 02.11.2024
Available online date: 21.11.2024
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in this context. The priority in managing the entire system was the provision of food and the supply of sustenance. The institutional structure of the empire was shaped in accordance with this priority, facilitating access to various and affordable food supplies (Genç, 2000).

1.1. Advances in Transportation Technology Transform the Relationship Between City Size and Agricultural Production

The relationship between urban phenomena, food regulation, and transportation costs has been reshaped by cultural advancements. After the 16th century, the development of capitalism, the advent of modernization, and the Industrial Revolution in production and transportation during the 18th and 19th centuries significantly altered the relationship between city size and food regulation. The most important change was the replacement of organic energy with inorganic energy in transportation, which greatly reduced the time and cost of transporting goods. This advancement in transportation technology meant that food regulation was no longer a limiting factor for city growth. Cities anywhere in the world that grew within market conditions would no longer face a limit in terms of food scarcity.

In the previous era, agriculture was primarily subsistence-based. Small family-owned plots of land produced what was needed for the family's own consumption, with a small portion sold in local markets to generate necessary cash. In an industrializing and modernizing world, agriculture became modern and commercial. Large-scale commercial agriculture, serving both national and international markets, was carried out using modern farming techniques, such as fertilization, pest control, and irrigation, based on healthy market information. Agricultural productivity per unit of land increased, meaning that the same amount of land could feed a much larger urban population. This led to a continuous increase in the proportion of the urban population. By the end of the 20th century, the proportion of the urban population, which had been below 10% in the pre-industrial era, rose to around 50%.

In subsistence farming systems, agricultural products were diversified, but in commercial farming, production became specialized in specific crops. Small landowners, who were the farmers of the previous era, could no longer participate in this kind of agricultural production. If a country was motivated to transition to modern agriculture, small landowners had three possible paths to success in this new environment. The first option was to lease land from others and expand their agricultural activities to become modern farmers. The second option was to form cooperatives, which could implement modern agriculture. The third option was to begin farming in greenhouses. Those who could not pursue any of these paths sold their land, became agricultural laborers, or migrated to cities.

During this period, settlement patterns were described with the opposing concepts of urban and rural (Tekeli, 2016, p. 127). A distinct division of labor emerged between urban and rural areas. Cities became the centers of non-agricultural activities, i.e., industry and services. They were densely settled areas with defined centers, forms, and boundaries, sprawling like an oil stain as new buildings were added. In rural areas, agriculture and forestry activities took place, covering all spaces outside cities and including villages. However, over time, this clear distinction between urban and rural began to blur. The opposition between urban and rural areas pushed agricultural activities entirely outside the city. The supply of food that would feed the cities was left solely to agricultural activities in rural areas.

1.2. Major Structural Changes in the World and Türkiye After 1980s

Significant transformations took place worldwide after 1980s. The shift from industrial society to informational society, from nation-states to a globalized world, and from Fordist production to post-Fordist flexible production occurred alongside a shift from modernist to post-modernist thinking. This transformation happened within the dominance of neoliberal political policies, and as a result, the urban-rural dichotomy lost its meaning. Agricultural activities began to take place in cities, and industrial and service sectors emerged in rural areas. The dividing line between urban and rural areas on maps became impossible to draw.

The shift to globalization and the informational society changed perceptions of urban phenomena, leading to the concept of the "planetary city," where the world was seen as one single interconnected urban entity (Brenner, 2014). The multi-faceted global transformation brought about a range of challenges in food planning that needed to be addressed. One major issue was the growing income inequality, exacerbated by the dominance of neoliberal policies. Solutions in food planning systems needed to ensure that all members of society could access affordable food, allowing everyone to achieve adequate nutrition.

As the world transitioned into the Anthropocene, both food production and transportation began to create serious environmental issues. The principle of sustainability, embraced at the Rio Summit in 1992, started spreading globally in response to rising awareness. As the impacts of climate change began to manifest, food planners recognized the importance of ensuring that solutions remained within the framework of sustainability. When it became clear that food production and transportation contributed significantly to the emission of CO_2 and CH_4 (carbon footprint), efforts were made to minimize the carbon footprint in food production and distribution. Planning began to consider carbon emissions as a cost factor, altering the optimal spatial distribution of agri-

cultural production. To reduce carbon emissions associated with transporting food over long distances, agricultural production to feed a community began to take place closer to consumption areas. This logic pointed to the need for urban agriculture. One reason for the breakdown of the urban-rural dichotomy was this shift towards urban farming.

Thus, the issue of planning urban areas that included agricultural production entered the agenda of urban planners. If a new city was being planned, addressing this issue would be relatively easy. However, in compact cities where urbanization was already complete, integrating agriculture posed significant challenges. In fully developed cities, agricultural activities would need to be introduced into marginal areas. For example, backyard gardens of residential buildings, parts of green spaces, and unused plots within cities could be repurposed for agriculture. Some even proposed utilizing balconies for this purpose. The development of soilless farming technologies could significantly contribute to the creation of innovative solutions. Another step to promote the spread of these practices could involve recognizing the dual value of growing food near or at one's residence. The first value is the market price of the products obtained. However, the subjective value derived from growing food at home, harvesting it by hand when needed, and using it fresh is a source of immense personal satisfaction that cannot be compared to market value. Just as accounting for carbon costs has caused significant changes in settlement patterns, considering this subjective value could lead to further developments in urban agriculture within compact cities.

2. In a Complex World, Both Urban and Food Planning Must Be Open Plans

As the Journal of Planning dedicates this special issue to "Food Planning," there is a search for how to integrate urban planning efforts with food planning. Two approaches can be taken in this endeavor. The first is to assume that the closed planning approach currently prevailing in Türkiye will continue, and develop solutions accordingly. The second approach is to recognize the negative outcomes and criticisms of the closed planning system and explore the opportunities offered by the open planning approach as an alternative. This article will follow the second approach (Tekeli, 2023).

The "Comprehensive Rational Planning" or "closed planning" approach used in Türkiye involves predicting the size and functions of a city twenty years into the future based on scientific analyses and then designing the city's spatial form accordingly. For twenty years, this plan becomes the single reference point for what is considered correct, good, and beautiful for the city. In this scenario, the plan must be implemented without deviation. However, urban phenomena are constantly evolving, our knowledge of cities and urban life is continuously changing, leading to the restructuring of coalitions of interests within society. Therefore, in a rapidly changing world, where threats and opportunities for cities constantly shift, it is impossible for an urban plan to remain undisturbed for twenty years.

These realities as well was the increasing complexity of societies make it impossible to predict the future with certainty. The emergence of complex systems is a collective phenomenon created by the interactions of individuals, and it cannot be reduced to individual actions. Complexity theory aims to analyze "self-organization", where the members of a system interact in non-linear ways. The social dimension, and its complexity, is constructed through relationships. The phenomenon of "emergence" takes the concept of planning out of the realm of closed systems. In such a scenario, only open plans can be discussed. Planning in the traditional sense becomes more about facilitating emergent processes rather than pre-determined outcomes.

Open planning diverges from closed planning in multiple dimensions:

- The first dimension is *the continuity of the planning process*. Planning must be ongoing, with the ability to respond immediately to every opportunity and threat. Open planning ensures that plans are always up-to-date and never obsolete.
- The second dimension pertains to *the decision-making process*, which must not exclude any member of society from decisions that affect their fate. Openness is defined through human relationships, making the plan a part of governance rather than a mere management. Such plans do not impose decisions on the community but work democratically with them.
- The third dimension is its relationship with a strong public sphere. In communities with well-developed public spheres, inter-subjective values flourish, fostering a sense of community and commitment. This creates a favorable environment for participatory planning.
- The fourth dimension provides the opportunity for communities to express their unique characteristics and identities.

When city plans are made as open plans in a country, it means that the residents of those cities remain vigilant about the development of their urban environments. Open plans create conditions where citizens cannot remain indifferent to their city's growth. Open plans are not authoritarian and are always open to new planning decisions, meaning they are inherently adaptable. Additionally, decision-making processes and the implementation of open plans must remain transparent and open to public debate, ensuring democratic oversight.

Especially in societies where participation capacities are low among marginalized groups, "Urban Social Laboratories" can be used to increase participation in planning processes.

In today's complex world, urban plans should be made as open plans. At the same time, food supply systems and their planning have become complex phenomena, leading to the necessity of open planning in food systems as well. Since food planning must be open to accommodate the nutritional needs of a community, it cannot be integrated with closed planning systems. Making both plans open will strengthen each of them.

3. The Severity of the Food Crisis in Türkiye Necessitates a Connection Between Food Planning and Urban Planning

To discuss food planning, we must first acknowledge its place within human rights. The oldest human right is the right to life, which was expanded in 1948 by the Universal Declaration of Human Rights to include the "*right to a dignified* life." Nutrition, necessary for sustaining life, is a fundamental human right. Everyone has the right to sufficient, safe, and healthy food that is easily accessible and sustainable. However, both the state and the individual share responsibility for ensuring that this right is exercised in a balanced and healthy manner. The problem of nutrition does not only arise when people lack access to adequate food, but also in cases of over-nutrition, leading to obesity. Today, this problem is experienced in both its facets, both globally and in Türkiye. Therefore, the right to food must be exercised in a balanced way. But the right to food goes beyond that: eating is a pleasurable and refined activity that brings people joy. Enjoying food is part of the right to a dignified life (Tekeli, 2017).

For a country like Türkiye, which has a large population and a strategic geopolitical position, producing enough agricultural products to meet the needs of its population is an important strategic goal. Türkiye's high level of microclimatic diversity allows for the production of a wide variety of crops. There are very few agricultural products that cannot be produced in Türkiye. Until adopting neoliberal policies in the 1980s, Türkiye had achieved a high degree of self-sufficiency by introducing new agricultural products, such as tea and various citrus fruits, and by reducing its reliance on agricultural imports through support policies. Türkiye had reached its strategic goal of making agriculture autonomous.

Until the 1980s, Türkiye had greatly reduced its agricultural imports and achieved self-sufficiency by introducing new agricultural products. However, after the 1980s, Türkiye adopted a neoliberal economic strategy that abandoned the import substitution model in favor of an export-oriented strategy. In response to the economic crises that followed, agricultural subsidies were reduced. As a result, the composition of agricultural production in Türkiye changed. While some sectors specialized in export-oriented products and developed, others became dependent on imports. This transformation occurred during a period when Türkiye was undergoing rapid urbanization, leading to a reduction in the total agricultural land. This reduction was primarily observed in the continuous shrinking of fallow fields, pastures, cultivated lands, and vineyards. In contrast, the areas dedicated to vegetable production, fruit and olive orchards, and greenhouse production (undercover cultivation) increased. Although Türkiye's total agricultural production and exports increased, the country's agricultural imports also saw a significant rise, eroding Türkiye's self-sufficiency. Türkiye became dependent on imports for staple products like grains (wheat and corn), legumes, oilseeds (sunflower, soybean), animal feed, and especially live animals.

Additionally, Türkiye's unplanned intensive agriculture contributed to the climate crisis. In 1990, Türkiye emitted an average of 3.96 tons of CO_2 equivalent per capita, a figure that rose to 6.04 tons per capita by 2013. Of the carbon emissions in Türkiye, 82.2% were generated by energy production, and 17.6% were attributed to agricultural activities. Agriculture was also responsible for 46.5% of methane emissions, 36.7% of waste emissions, and 79.4% of nitrous oxide emissions.

Furthermore, one of the critical outcomes of *unplanned* agriculture in Türkiye was the fluctuation of prices for products like onions, potatoes, and tomatoes. Farmers decided which crops to plant based on the prices from the previous year, leading to significant problems. In a year of low production, prices would rise, and farmers would make substantial profits. However, when many farmers planted the same crop the following year, prices plummeted, leaving farmers unable to sell their produce and facing significant losses. This production pattern led to significant harm for consumers in one year and for producers in the next.

When a country's economic policies follow the Washington Consensus, the capitalist policies implemented often lead to frequent economic crises. During these crises, income inequality widens, and low-income groups face significant nutrition problems. In the current crisis in 2024, food prices in Türkiye have skyrocketed, and the number of people at risk of hunger has increased significantly. Additionally, food price trends in Türkiye have diverged sharply from global trends. While global food prices have been on a downward trend, food prices in Türkiye have continued to rise, making the food crisis in Türkiye particularly critical. Low-income groups, who previously lived in squatter areas, were further affected when urban transformation projects began to dismantle squatter areas. The loss of food production in the gardens of these squatters exacerbated the situation (Tekeli, 2017, p. 24).

4. How Can Food Planning Be Integrated with Urban Planning in Türkiye?

We have seen how agricultural production in Türkiye has evolved, the multi-faceted problems it has created, and how it has led to both an economic and agricultural crisis. However, the monetary policies that Türkiye develops to emerge from its economic crisis will not also resolve the crisis in the agricultural sector. Solving the agricultural crisis requires separate and comprehensive planning. Since this article focuses on the local implementation of Türkiye's agricultural policy, we must also consider how it can be integrated with urban planning. The proposed food planning must address the issues we have outlined thus far. Let us now examine the fundamental principles of the proposed food planning and its connection to urban planning on various levels.

- In Türkiye's agricultural planning, the primary focus should be on ensuring the right to a dignified life and achieving self-sufficiency in agriculture as a strategic goal, giving priority to producing the necessary food domestically. The solution should not be sought in imports.

- Türkiye has already laid the groundwork for successful agricultural planning. The Farmer Registration System has been established, large plains have been identified, and the Council of Ministers has been given the authority to determine the pattern of agricultural production in these plains. Using this preparation, Türkiye can plan its agricultural production to meet domestic needs and increase exports. To achieve these goals, differentiated agricultural support programs should be developed based on regions and products. The support amounts should comply with Article 14 of the Agricultural Law, which stipulates that agricultural support must not be less than 1% of the Gross Domestic Product.

- In line with these support programs, the quotas for products to be produced in the designated agricultural basins (large plains) each year, and how they will be distributed, should be determined. When making these decisions, efforts should be made to shorten the food supply chain to reduce Türkiye's carbon footprint.

- In metropolitan cities/localities where agricultural planning is carried out, it is essential to ensure that agriculture becomes a respected and sustainable activity that contributes to economic development and is environmentally friendly.

- A metropolitan municipality, when implementing its agricultural policy, should prepare a new 1/100,000 scale territorial plan for its surrounding region. This new territorial plan will integrate the food plan with urban plans. Achieving such integration will largely depend on reorganizing the existing legend in the plan.

- In this context, greater municipalities, in particular, should work to improve the agricultural infrastructure within their jurisdiction to increase local agricultural production. This includes paving field roads in areas with high agricultural productivity, expanding cold storage capacity, establishing a network of accredited laboratories for agricultural analysis, and creating a cold chain system.

- Given the uneven development in Türkiye and the agricultural crisis, the threat of hunger and malnutrition facing low-income groups has prompted the government and metropolitan municipalities to develop social programs. Integrating these programs with local agricultural planning efforts could help solve some of the critical issues in agricultural planning, particularly the problem of demand.

- To reduce the carbon footprint, food planning should aim to shorten supply chains, necessitating an increase in urban agricultural activities. In this regard, district municipalities could play a significant role. These municipalities, with their existing powers, can successfully run campaigns to increase the production of agricultural products within their jurisdictions. For example, a campaign could be launched to use small vacant spaces within the physical fabric of a district or the balconies of buildings for agricultural production.

I have reached the end of my article, which discusses how food planning and urban plans can be integrated at the local level in Türkiye. Some practical steps have already been taken in this area (Greater Municipality of İstanbul, 2021). In the face of the global climate crisis and the food crisis in Türkiye, urban planners are increasingly compelled to adapt and evolve their planning approaches. I expect this necessity will further distance them from closed planning systems and bring them closer to open planning.

Note

This work was prepared by Prof. Dr. İlhan Tekeli, and the translation of the text into English was done by Dr. Mustafa Raşit Şahin and Dr. Sıla Özdemir. The sole author of the text is Prof. Dr. İlhan Tekeli.

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Planlama 2025;Supp(1):153–156 | doi: 10.14744/planlama.2025.61224

OPINION / GÖRÜŞ

Gearing Up the Urban Gardens as Disaster Parks: An Urgency for Food Resilience During Crises

Krizler Esnasında Gıda Direngenliği için Kentsel Bahçelerin Afet Parkları Olarak Düzenlenmesi: Bir Aciliyet Meselesi

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Introduction

When considering the topic of food planning for urban areas, it is typical to focus on the ordinary flow of life. However, it would be remiss not to consider what might be termed 'extraordinary' days. In the event of an earthquake, fire, flood, or landslide, for instance, or in the case of a drought, war, or economic or health-related crisis, how might the usual flow of food to the city be interrupted? What measures might be taken to ensure the continued provision of food if the normal production or supply chains are no longer useful?

The most recent example is the global COVID-19 pandemic, which resulted in a worldwide phenomenon of people rushing to markets in a state of panic, leading to the emptying of shelves. It was observed that those with greater financial resources could procure additional supplies, whereas those with limited purchasing power faced an even more perilous and destructive situation. Therefore, despite the fundamental human right to food, access to it can become problematic in times of crisis.

In this paper, I will suggest that urban parks on the one hand, and urban market gardens and orchards on the other, should be considered spaces of resilience against disasters and crises. Although urban gardens have a deep root in the history of cities in Türkiye, excessive urbanization destroyed this tradition and most gardens are destroyed. Unfortunately, the revival of urban agriculture as a mode usually means hobby gardening whereas urban gardens might have a bigger role in disaster resilience. Urban agriculture reintegrates green spaces, providing shade, cooling the air, and supporting diverse wildlife, even small green areas can offer food and shelter for various species, inviting nature back into urban life. Last but not least, it can potentially improve community resilience to market shocks during crises.

This paper presents the argument that urban parks should be designed and equipped with the objective of enhancing resilience against disasters and crises in terms of food.

Urban Agriculture as a Means for Resilience

Urban agriculture encompasses a range of practices, from allotment gardens to large peri-urban areas devoted to large-scale farming, and from occupied public land used by citizens as a measure against famine to transformed public space by local administrations as a measure against global warming.

Urban agriculture practices can be categorized as follows:

1. According to the type and structure of the organization: guerrilla organizations, community organizations, local government-led initiatives, school kitchens, etc.

Received: 23.10.2024 Revised: 06.01.2025
Accepted: 20.01.2025 Available online date: 26.08.2025
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2. According to the types of implementations: rooftop gardens, vertical farming, school gardens, urban farms, agriculture parks, etc.
3. According to users: children, disabled individuals, the elderly, urban poor and disaster victims.

It can be seen that urban agricultural practices, regardless of their scale, are largely concerned with food security. However, in that regard, we need to consider the potentiality of urban parks which generally are not considered in terms of resilience. A "park" can be defined as a green space where city dwellers are engaged in a range of activities, excluding farming. Similarly, a "garden" can be defined as a space where farming is practiced. While in some cities, there has been an increase in the number of parks that include areas of horticulture, this is not yet a widespread practice, at least in Türkiye.

Nonetheless, in this paper, I will defend the idea that parks, as well as gardens and orchards in the cities, should both be geared up to become spaces for food production and thus act as spaces of resilience for disasters and food security.

Human history is replete with food production outside the "normal" spaces of farming. In World War II, for example, Great Britain households started growing food in their backyards; in the US, Victory Gardens or War Gardens involved the establishment of private and public gardens for the purpose of food production.

Moreover, numerous more recent examples can be cited. In India, for instance, the significant impact of the COVID-19 pandemic on the food security of poor households in urban and peri-urban areas prompted a response in the form of extensive urban farming, supported by local governments in some regions in the form of the opening of the public lands to farming.

In Argentina, after the economic crisis of 2001, in Rosario –the country's third largest city–, "residents struggled with an economy in freefall, another crisis loomed in the background. Climate change was heating the city and making rainfall more erratic, leading to both flooding and fires" to which the municipality responded with Urban Agriculture Program that "gives low-income residents access to underused and abandoned public and private land to cultivate food, originally was intended to alleviate food scarcity and provide economic opportunities. Over the years, the municipality evolved the program into a cornerstone of its inclusive climate action planning" (Maassen & Madeleine, 2021).

In Greece, the economic crisis of 2007-2008 accelerated the diffusion of urban agriculture in Greek cities: "The most well-known cases of civil society's urban agricultural exploitations appeared in 2011: the self-managed field of Ellinikon Airport in the south of Athens and PER.KA (suburban cultures) in Thessaloniki (ex-military camps). Both are part of the movement that reclaims the free and public spaces. Since 2012, urban agriculture has been spread either by civil society or with the help of local authorities (municipalities)" (Kolokouris, 2015).

In an article aimed at exploring the adoption of urban agriculture in four different crisis scenarios, the author mentions World War II as the first example and then states the others as follows: "Urban agriculture has been utilized as a long-term solution to address food security during contemporary economic and social hardships (the case of Detroit); times of political instability, trade embargoes and economic decline (the case of Havana), as well as in post-conflict periods (the case of Sierra Leone)" (Daneshyar, 2024).

It is unlikely that urban agriculture will become the cornerstone of national food security or replace rural agricultural production. However, it does have the potential to improve the resilience of communities to market shocks that occur during crises. Beyond crisis periods, urban agriculture offers numerous advantages:

- It fosters connections among people and promotes community involvement.
- It can improve well-being, alleviate anxiety, and enhance mood.
- It supports learning about nature and healthier dietary choices.
- It creates jobs, helps preserve biodiversity, and benefits the environment.

Ecological Parks in Ordinary Days, Survival Parks in the Disasters

The paper's conceptual framework is built on the resilience approach, defined "not as an asset but a process of change" by Davoudi (2012, p. 304) who considers resilience not only as developing the ability to recover from shocks and crises but also as acquiring the ability to be prepared for them and seeking potential transformative opportunities. As such, this paper aims to put the concept of "preparedness" at its center, defined as the development of proactive strategies and practices that go beyond the reflex of adapting to adversities and potential crises and protecting the existing system.

Based on observations and insights from two personal experiences, in this paper, I will defend the idea that the disaster-preparedness of urban parks and gardens would yield a high resilience capacity to the cities. My first experience is the Piyalepaşa Orchard, a historical market garden in Istanbul city-center, occupying a space of around 6000 m^2. I voluntarily work as an urban farmer assisting the gardener family who has been there for 30 years. This is a 500-year-old garden that still produces mainly green leaves and all sorts of vegetables and yearly fruits for centuries, it is an invaluable droplet of

nature in a city of cement and asphalt. The second one is a park in Hatay, one of the 10 cities hit by the earthquakes in February 2023 and the one which is the most seriously destroyed with a very high number of victims. Just after the disaster, civil society from all over the country rushed to help the survivors. This park was quite old and practically unused until that date. Still, the earthquake did not destroy it, so a few formal and informal collectives came together to create a space for children of the neighborhood and their families. I took part in that process and also, one year later, I developed a project thanks to a small grant program (from BAYETAV) to transform the park into an ecological park.[1]

These experiences made me grasp the importance of these spaces for the "preparedness" of cities if they were to be designed accordingly in terms of proactive ecological strategies and practices. They would thus serve as parks or market gardens in the normal course of life and will function as survival parks when a disaster occurs.

To achieve this, they must be built on three pillars: Ecological Infrastructure, Ecological Skills, and Institutional and Social Cooperation.

The first of these is the integration of an "Ecological Infrastructure". This pillar includes the following:

The implementation of a *water purification system* enables residents to access clean water, thereby reducing the reliance on single-use plastic bottles. This is of particular significance not only during ordinary circumstances but also in the aftermath of disasters, as evidenced by the events that transpired in Türkiye following the February 2023 earthquakes.

Solar energy systems, limiting the dependency on the electricity network, will also limit the park's carbon footprint and enable park users to have energy during a disaster.

Rainwater collection has ecological value in both situations but will be extra significant during a disaster where access to water is limited.

Components related to food are invaluable aspects of an ecological park. In *Urban Gardens*, various examples of urban agriculture are meant where park users produce one-year or multi-year crops in raised beds or open ground. This can have various sizes and forms: it can be a market garden tended for subsistence, it can be a community garden taken care of by a small or large group of persons, it can have small plots for leisure purposes, or it can have an education-oriented function. In *Food Forests*, fruit trees are integrated into a system of food production at different levels (for example, herbs on the ground level, greens, and berries under the trees, etc), in disaster times food production of all sorts would have vital importance, in the proper sense of the word, and along with stored durable food, they will serve the survival of the nearby community. In *Medicinal and Aromatic Plant Gardens*, esp. local species produced for healing purposes are cultivated. For food autonomy and food security, food production at the scale of a neighborhood (even better if most of the residents are involved) is extremely important.

Linked to food production in the garden as well as in terms of waste management in the neighborhood, composting is a crucial element to be integrated, so a *Compost Corner* should be implemented.

A Compost Toilet (or at least, a *Dry Toilet*) has to be added to this scheme, which would be essential in demonstrating to the citizens that a waterless toilet system is possible, it becomes vital in the post-disaster period when sewage systems are broken.

In addition to these fundamental components, it is essential to consider the incorporation of a social center designed as a *Passive Energy Building*, obviating the necessity for supplementary heating or cooling systems. This is a crucial aspect in the context of disaster management, as the building will be utilized to provide essential shelter.

Last but not least, a *Seed Library* needs to be added to the overall structure.

The second pillar comprises the "Ecological Skills", which complement the first pillar. Through the acquisition of these skills during their daily lives, residents will not only be better prepared for disasters but will also become integral members of the park community. It is essential to provide ongoing instruction in these skills through workshops and hands-on learning programs, with a focus on all age groups but with a differentiated approach according to age. These skills must be diversified, particularly in the context of a post-disaster period, when individuals with these skills will be entrusted with responsibilities.

These skills encompass, but are not limited to, the following:

- Simple water filtering mechanism
- Sun oven
- Root cellar
- Rocket stove
- Insect repellents
- Basic gardening & recognition of edible herbs
- Seed saving
- Simple rainwater collection
- Composting & Compost toilet making
- First aid, fire building, shelter & food preparation

[1] See Yılmaz & Yıldırım (2025) for a guidebook of "Life Parks" model, developed after these experiences and summarized in this paper.

The first two pillars constitute the Climate Action Component, while the third, the "Institutional and Social Cooperation", is of equal importance in the park's implementation. The local administration must be included from the outset to provide the necessary layout and ensure the flow of action. Organizational Aspects and Community Building are two components that tie all three pillars, without which, the park area or whatever green space is reduced to a simple *Gathering Area*.

Hence, the *Administrative Unit* is extremely important not only in the organization during the pre-disaster and post-disaster periods: in this latter, it can be used for the emergency medical response. Temporary shelter materials and units of food and kitchenware storage should be foreseen to allow collective cooking and eating areas. Once again, ordinary days are days during which the *Spaces – Materials – Persons* – Tasks should be minutely examined and organization schemes for the extraordinary days should be prepared. Japanese disaster parks serve as excellent case studies for organizational preparedness in the pre-disaster period. This preparedness is evident not only in terms of material and construction but also in terms of community tasking (McKean, 2014).

Another extremely important part is the WASH (water, sanitation, hygiene) area of the park, which should be specially designed with safety features for female and LGBT+ users. The lack of this feature was disastrous during the 2023 earthquakes.

To end this brief note, I would like to underline once again the potential of urban gardens and parks for crises: pandemics, economic crises, wildfires, flooding, earthquakes, and wars… Their impact on humanity is a significant concern in the near future. In countries such as Türkiye, where preventive measures and post-disaster preparedness are not yet sufficiently calculated nor prepared for, these risks are particularly elevated. In light of these risks, which become even more lethal when coupled with the challenges of accessing food in the immediate aftermath of a disaster, it is imperative that we, as citizens of a locality, collaborate to ensure food security through the utilization of green spaces. Furthermore, we must exert pressure on local governments to facilitate this endeavor.

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Planlama 2025;Supp(1):157

We would like to thank all the reviewers of this special issue for generously sharing their valuable expertise and for contributing to the development and promotion of our journal

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