Integrating urban and peri-urban agriculture in planning systems. Barriers, policy tools and recommendations

Planning Practice & Research

ISSN: 0269-7459 (Print) 1360-0583 (Online) Journal homepage: www.tandfonline.com/journals/cppr20

Integrating urban and peri-urban agriculture in planning systems. Barriers, policy tools and recommendations

Claudia Cassatella & Enrico Gottero

To cite this article: Claudia Cassatella & Enrico Gottero (10 Mar 2025): Integrating urban and peri-urban agriculture in planning systems. Barriers, policy tools and recommendations, Planning Practice & Research, DOI: 10.1080/02697459.2025.2472115

To link to this article: https://doi.org/10.1080/02697459.2025.2472115

Published online: 10 Mar 2025.

PLANNING PRACTICE & RESEARCH
https://doi.org/10.1080/02697459.2025.2472115

Routledge
Taylor & Francis Group

Integrating urban and peri-urban agriculture in planning systems. Barriers, policy tools and recommendations

Claudia Cassatella and Enrico Gottero

Interuniversity Department of Regional and Urban Studies and Planning (DIST), Politecnico di Torino, Torino, Italy

ABSTRACT

Since the early 2000s urban and peri-urban agriculture (UPA) has gained attention in urban policy discourse. This increased interest prompts questions about the best tools to support UPA development. By analyzing UPA practices around the world, questionnaires and interviews, this paper aims to collect and analyse the specific policies and planning tools to develop and manage UPA. The authors discuss the integration of UPA in land use systems and reflect on what these new practices bring to the planning discourse. Finally, the paper identifies the main obstacles limiting the development of UPA and proposes a typology of policy tools and some recommendations for cities and city regions.

ARTICLE HISTORY
Received 30 April 2024
Accepted 21 February 2025

KEYWORDS
Urban and peri-urban agriculture (UPA); urban planning; urban policy instruments; land use zoning; European forum for urban agriculture

1. Introduction

Since the early 2000s, urban and peri-urban agriculture (UPA) has gained attention in the urban policy discourse, at the intersection with environmental, social and economic policies. While the initial phase of studies focused on identifying types (Lohrberg *et al.*, 2016; Jansma *et al.*, 2021) and benefits of UPA (Cassatella & Gottero, 2022), the increased policy interest prompts questions about the best tools to support UPA in practical implementation (FAO, Rikolto and RUAF, 2022). Spatial planning is called upon to deal with agriculture from a renewed perspective. On the one hand, it needs to identify what the available or potential policy tools are to integrate UPA into spatial policies. On the other hand, it needs to interpret the emerging topicality of agriculture in the urban planning discourse, in relation to the traditional urban–rural dichotomy that characterized the birth of the discipline. In fact, some authors claim that UPA deserves a new zone in land use planning systems (De Zeeuw *et al.*, 2000; Huang & Drescher, 2015; Halvey *et al.*, 2021).

For these reasons, this paper analyzes the emerging role of UPA in urban policies and in urban planning, the typology of available instruments to establish UPA, and the relationship among policy demands, expected benefits, and tools in use. Using an empirical approach, our research addresses the following questions: are there policies

CONTACT Enrico Gottero enrico.gottero@polito.it

specifically established for UPA? What types of policy tools are used, or can be used, to promote and manage UPA from a spatial planning perspective? What are the difficulties to be addressed? How can a policy instrument be designed to enable UPA? Should we consider UPA an agricultural zone, or an urban one, or a new hybrid third type?

Scientific literature is rich in studies on UPA types and benefits and offers many case studies, but the focus on planning instruments is rare. This gap has been identified by several authors, and some attempts have been made to analyze case studies (seefor example, Marini *et al.*, 2023), but a systematic review is lacking. This paper builds upon the results of the EFUA Projects,[1] integrating the Polytechnic University of Turin studies on the benefits of UPA, their relationships with urban concepts and policies, and the urban planning tools. The investigation of the EFUA project covers case studies on all continents and instruments at several levels – from national to local. The crucial spatial foci are the city and city-region scale. In only a few cases, local initiatives are framed by national or regional strategies (such as in Norway and France). To define the varied UPA phenomenon, we rely on the results of the EFUA Project including both intra-urban and peri-urban spaces, professional farming and hobby gardening, traditional as well as high-tech practices. Despite their differences, they all have a spatial dimension and, as a consequence, they all are subject to land-use classification and designation.

Adopting spatial planning as the key technique that can be used to define the status of UPA, in the next sections, we examine its recent attempts. In section 2, the authors discuss the role of agriculture in the urban domain and planning debate, including the new role of UPA in the urban–rural perspective and the gap in planning studies. Section 3 illustrates materials and methods used in order to understand the role of UPA in the urban policy and planning frameworks, including interviews, surveys and case study analysis. Section 4 highlights the main results of this research, concerning current difficulties for the development of UPA, the thematic domain of urban policies for UPA, the existing spatial instruments and regulatory tools. Section 5 proposes a systematization of planning and management tools and discusses issues related to zoning and the integration of UPA in urban planning. In addition, authors define recommendations for designing urban policies; this section is addressed to city and regional authorities when making use of UPA as a tool for achieving sustainability goals. Finally, in the conclusions, the authors discuss the possibility of defining a new urban zone for UPA and outline directions for future research.

2. Setting the context: agriculture and planning in urban areas

Although agriculture has been a component of the town and country planning scope since its origin, the institution and consolidation of modern planning has relegated agriculture to a rural activity, physically separated by functional zoning, unrelated and partly antithetic to the functions characterizing the urban areas. Until the early 2000s, UPA was considered as a non-urban economic activity, mainly related to the rural sphere (Quon, 1999; Pothukuchi & Kaufman, 2000; Lovell, 2010; Huang & Drescher, 2015; Horst *et al.*, 2017; FAO, Rikolto and RUAF, 2022). As an activity pertinent to the rural domain, agriculture has been subjected to dedicated sectoral policies, and has long been ignored by urban planning. Pothukuchi and Kaufman (2000) suggested that the lack of knowledge and training on this topic and the predominantly private management of the

agri-food system were the main reasons for the low interest of urban planning in UPA. Others (Thibert, 2012; Huang & Drescher, 2015; Horst *et al.*, 2017) also claimed that urban planners were insufficiently trained to tackle an issue that requires a multidisciplinary approach.

This situation has only recently changed, with an increasing number of planning scholars and practitioners that argue in favor of the potential contribution of agriculture to the urban environment, not only in terms of food provision but also as a means to achieve environmental and social sustainability goals. According to the literature (Provè, 2018; Langemeyer *et al.*, 2021; Tapia *et al.*, 2021; FAO, Rikolto and RUAF, 2022), UPA can provide potential benefits to different dimensions of urban sustainability, such as feeding the city, making the city inclusive, tackling inequalities, improving the value of recreation, climate mitigation, greening the city, maintaining biodiversity and ecosystems and improving local economies. The interest in benefits that UPA can provide in the urban environment can be attributed to the 'strategic turn' of spatial planning that widened its interest, content and instruments. UPA is a new kind of content, perhaps the most striking if seen in relation to the classic idea of the urban–rural dichotomy. The new role of agriculture had already been recognized by studies on the peri-urban phenomena since the 2000s (Busck *et al.*, 2006; Seto *et al.*, 2010; Piorr *et al.*, 2011; Olsson *et al.*, 2016) and endorsed by policy statements on the rural urban partnerships and linkages (Davoudi & Stead, 2002; Organisation for Economic Cooperation and Development (OECD), 2013; UN-Habitat, 2017, 2019). Now, it is being debated at a planning level, entering into the very plot and lexicon of the plans. UPA is also endorsed by discourses on greening cities, short food chains, proximity and new sustainable lifestyles – new issues of the planning discourse that also intersect with the environmental turn.

So far, planning studies related to UPA have approached the subject through three lenses: food, green spaces and land use regulations. Some scholars have analyzed the role of UPA in food policies (Campbell, 2016) and systems (Morgan, 2015). Morgan (2015) stated that UPA is 'a new foodscape', an instrument to promote alternative food networks and to produce food for both social and profit-driven purposes. UPA has been examined in terms of food self-sufficiency and provision, especially at the city-region level (Monaco *et al.*, 2017; Sioen et al., 2017, 2018; Jensen & Orfila, 2021), paving the path for the concept of 'food planning'. Recent studies focus on the role of UPA in the management of urban green spaces and green infrastructure, as well as for climate adaptation and mitigation (Smith et al., 2017, 2021; Contesse *et al.*, 2018; Hou, 2020; Zambrano-Prado *et al.*, 2021).

The lack of a formal recognition and integration of UPA in land use planning and instruments is an issue extensively debated in the literature, especially within the American Planning Association (APA) (Quon, 1999; De Zeeuw *et al.*, 2000; Pothukuchi & Kaufman, 2000; Mubvami *et al.*, 2006; Lovell, 2010; Thibert, 2012; Huang & Drescher, 2015; Cabannes & Marocchino, 2018). Starting from the early 2000s, APA has had a central role in reinforcing the relationship between UPA and planning (Ilieva, 2014), supporting innovative UA-related planning practices at the city level in US cities such as New York, Baltimore, Portland, Sacramento and Seattle. In the last two decades, many cities have developed and supported a wide-range of UPA initiatives through heterogeneous urban public policies and instruments such as strategies, plans, regulations, incentives (Provè, 2018; Halvey *et al.*, 2021; Marini *et al.*, 2023).

As a result of the growing experience, some scholars have focused on instruments to regulate and support decision making and to identify areas available for UPA (McClintock et al., 2012, 2014; Huang & Drescher, 2015Napawan & Townsend, 2016; Specht *et al.*, 2016; Halvey *et al.*, 2021; Lucertini & Di Giustino, 2021; Wang *et al.*, 2021).

3. Material and methods

UPA is a complex and heterogeneous phenomenon which encompasses multiple nuances and purposes. In this paper, we refer to a concept of UPA that includes both professional and non-professional initiatives (Lohrberg *et al.*, 2016), in intra-urban and peri-urban areas. We investigate municipal and city-region initiatives at the local administrative level. To identify urban planning approaches and tools supporting the development of UPA from empirical evidence, our research process adopted a sequence of methods (Figure 1): i) semi-structured interviews; ii) online questionnaires; iii) and case study analysis. In fact, we integrated the research done during several phases of the EFUA Project, related to UPA types, benefits, urban concepts and policy tools. We addressed different stakeholders to collect information on existing practices, their nexus with local policies and opinions on difficulties and opportunities related to existing policies. Thanks to these surveys, a provisional typology of policy tools was drafted applied to the case studies' analysis and supplemented by the literature review. Finally, the issues that arose during the interviews and questionnaires contributed to designing recommendations on the choice, use and integration of the policy tools.

3.1. Semi-structured interviews

Semi-structured interviews were carried out by two researchers with the support of EFUA project partners between April and July 2021 (see Jansma *et al.*, 2021), in Dutch,

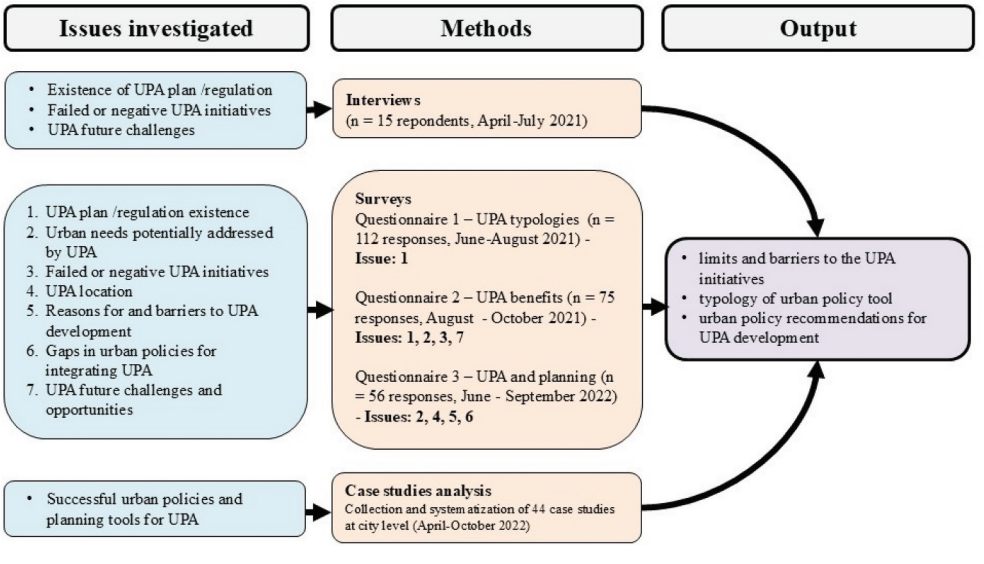

Figure 1. Methods and main output.

German, English, Spanish and Italian. Interviews were video-recorded, anonymized, translated into English where necessary, transcribed and stored in an institutional repository. Sixteen stakeholders, including scholars, opinion makers, farmers and hobby gardeners, as well as public officials and civil servants, were selected with the help of project partners in order to involve the greatest number of representatives of different cities and European countries. The interviews, focused on the typologies and benefits of UPA initiatives, included specific questions on the subject of their governance and planning as follows: any specific UPA development plan and/or regulation applied in their city (or city-region) or of which they were aware, any failed or negative initiatives they knew about, and what the future challenges are.

3.2. On-line questionnaires

During the EFUA project, we carried out three surveys that included questions related to the relationship between urban planning and UPA. Questionnaire 1 was conducted during the spring 2021 by EFUA partners (see particularly section 3.5 of Jansma *et al.*, 2021) and it focused on the UPA typologies. This questionnaire involved 112 European UPA initiatives and included specific questions on urban polices for UPA. It was conducted if the initiative was started within the framework of and/or with the support of a local, national or EU policy approach, as well as if the city had a specific UPA development plan/policy/strategy and/or a regulation at the municipal or at any other level. Questionnaire 2 (on the expected benefits of UPA, see also Cassatella & Gottero, 2022) was conducted from June to September 2021 and involved mainly experts and city officials. Participants were asked to express their opinion on what urban needs could be addressed through UPA and whether a specific UA development plan and/or UA regulation existed in their city or at other administrative levels. Questionnaire 2 also included some questions on future prospects, directions, potential challenges and/or opportunities related to UPA practices in the cities of participants. Furthermore, respondents were also asked for any information about failed UA initiatives and how failures could be avoided in the future. Questionnaire 3 was conducted from June to September 2022 addressing professional farmers and urban gardeners (Cassatella *et al.*, 2022). It included 16 questions (see Appendix A) on the location of UPA (private or public land, intra-urban area or outside urban area), the most important urban needs that may be addressed through UPA initiatives, the main reasons and barriers impacting the development of UPA, as well as what urban public policies should do to encourage UPA.

3.3. The analysis of case studies at a city level

UPA takes different forms, depending also on the socio-economic conditions in each country. In addition, UPA initiatives within a country can be very different, varying from city to city. In order to collect and identify a comprehensive set of urban policies and planning tools concerning UPA, we selected case studies at a city or city-region level that explicitly support UPA development in different ways. We selected different cases in all continents with the aim of having the maximum diversity of contexts, governance arrangements and policy tools. In this view, the sample is not

a statistical representation of the phenomenon, but a collection of different planning approaches and tools. These case studies were selected through the unstructured literature review, from other results or tasks of the EFUA project and suggestions from project partners, as well as from recommendations of participants from previous questionnaires and interviews. Research papers, grey literature and documents on designed cases were also collected through the help of databases such as Google Scholar, Scopus, ResearchGate and Mendeley, as well as searching on institutional websites of city authorities. These case studies were presented in a Google web map and table (see Appendix B). Thanks to previous literature reviews and questionnaires, we identified the set of possible public policies and related thematic domains in which UPA practices may fall under and used these items as analytical keys to classify the initiatives. Due to their variety, we had to keep the object of investigation as open as possible. From hereinafter, we will use the term 'policy tool' to include strategies, plans, programs, regulations and any other public policy instruments. Since spatial planning is our main focus, we also framed each practice within its country's spatial governance and planning system (having regard to the classification proposed by Berisha *et al.*, 2021). Consequently, the case studies are analyzed according to the following items:

(a) the denomination, country and city, the country classification (according to United Nations, 2020),
(b) the type of intentional public policy (strategy/vision, program, project, land-use zoning instrument, sectoral policy, regulation),
(c) the main topics or thematic domains of urban strategies/policies (such as urban–rural partnership, urban green development and management, climate adaptation and/or mitigation, urban nature protection, urban forestry, food strategies),
(d) the spatial governance and planning system.

4. Results

4.1. The integration of UPA in urban planning

Questionnaire 1 (see also: Jansma *et al.*, 2021) produced 112 responses. Concerning planning issues, it showed that 58% of the UPA practices collected are the result of several initiatives and not the outcome of public policy implementation. A strategy or vision frames 11% of the cases; in 9% of the cases, a combination of tools is applied (Figure 2). In addition, a minority of respondents claimed that cities have a specific plan or policy for UPA development or management and/or a dedicated regulation at the municipal or at any other level. Often UPA is an integral part of tools with a different focus (Figure 3).

Questionnaire 2 (see also: Cassatella & Gottero, 2022) produced 75 responses, which were mainly from scholars and less than half from city officials and servants. Both sets of participants stated that UPA can mainly be helpful in addressing the social and environmental-climate issues of cities, while UPA is less effective in terms of cultural and economic dimensions. 52% of the participants stated that recently some cities have developed a UPA plan and/or regulation such as in the case of Turin and Rome (Italy), Ghent (Belgium), Bristol (UK), Krakow (Poland), Oslo (Norway), and Vilnius

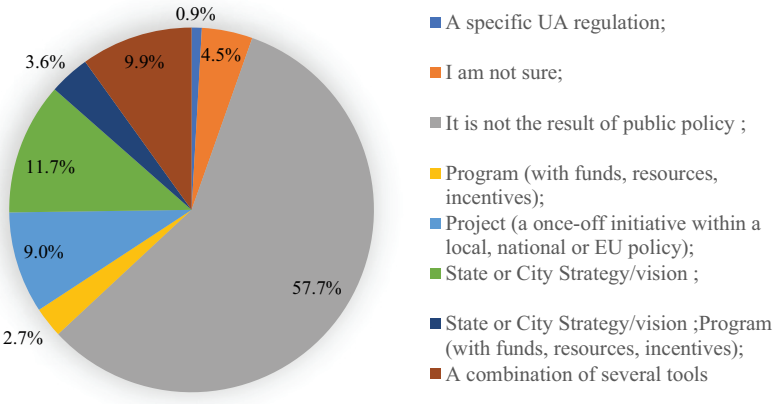

Figure 2. Framework within which UPA initiatives started (reworked from: Cassatella *et al.*, 2022).

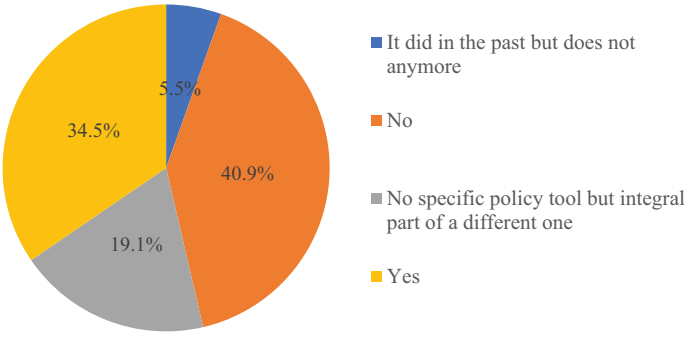

Figure 3. Existence of specific urban agriculture development plan/policy/strategy, and/or a regulation at the municipal or at any other level (reworked from: Cassatella *et al.*, 2022).

(Lithuania). Semi-structured interviews also showed other types of instruments that aimed to integrate UPA, such as agricultural parks (for instance, Rome's Master Plan), the French 'projets alimentaires territoriaux', as well as different typologies of municipal ordinances or farmers' market regulations.

When highlighting potential challenges that UPA initiatives will have to face, respondents to Questionnaire 2 mentioned the primary need for developing integrated planning tools and policies at a strategic level, cooperating with local authorities and involving farmers and local communities in decision making, improving UPA infrastructure, as well as providing economic funds to cities and better access to support and finances. Issues related to land use and tenure, i.e., long-term and temporary use, public and private ownership, social conflicts, preservation and accessibility, are other important themes that UPA managers and cities should tackle, according to respondents. Land-related issues and high management costs are the most frequent reasons identified as being behind the failure of UPA initiatives, according to respondents. Some respondents

also recognized the crucial role of UPA, including rooftop and indoor farming, in terms of redevelopment of abandoned areas and brownfield sites. In addition, semi-structured interviews also showed that the scarcity of financial resources, the lack of public and private spaces for UPA and the high demand for water are other technical factors that contribute to the failure of UA initiatives. Concerning socio-economic reasons for the possible failure of UPA initiatives, the competitiveness with the global agri-food market and the lack of an adequate marketing strategy, the presence of numerous opponents and the lack of public plot management, are other possible critical points that arose in interviews.

Questionnaire 3 provided 58 responses mainly from non-professional urban gardeners (38%); the questionnaire also included responses from professional farmers (17%) and scholars (14%). More than half of these are part of an association/organization of gardeners or farmers. Respondents mainly come from European countries, particularly Italy (24%), Denmark (22%) and Belgium (19%). The majority of respondents claimed that issues related to restrictions from local land use regulations and zoning codes, as well as land use conflicts, access and ownership are the biggest obstacles to preserving and developing urban and peri-urban agriculture. The lack of cooperation is another important point to be considered to avoid the failure of UA initiatives. Instead, farmer conditions, the possible contamination of soil and conflicts with residents appear to be less alarming issues (Figure 4). The majority of respondents stated that urban public policies should address some pressing issues such as the integration of UPA into planning tools and policies and the creation of UPA strategies and action plans at a city level. According to the majority of respondents, public policies should ensure public land and

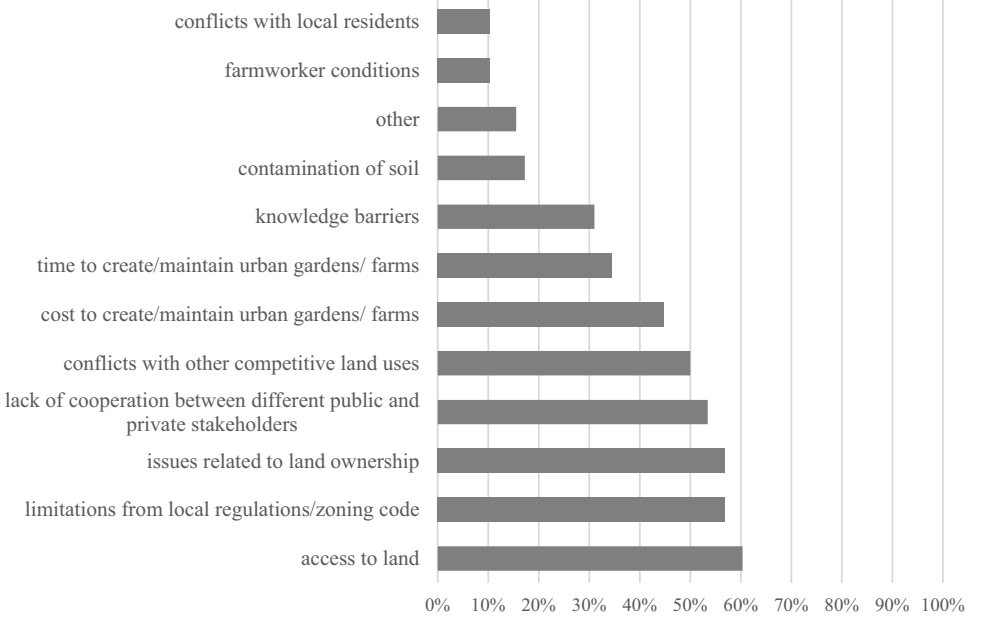

Figure 4. The main barriers to keeping and developing urban and peri-urban agriculture according to respondents (multiple answers allowed) (reworked from: Cassatella *et al.*, 2022).

financial incentives, as well as identify specific zones for UA. Less than 40% of the respondents opted for the creation of specific agreements with farmers, the promotion of UPA benefits, the provision of training and support, as well as the identification of a minimum surface area for UPA (Figure 5).

Finally, interviews highlighted perspectives and urban themes related to UPA, as well as urban challenges that UPA will probably have to face in the upcoming future. Many respondents claimed that the management of natural resources (in particular, soil) and land use conflicts are priority issues for UPA. Considering the 'pressure on land' and the 'competition for land' as critical issues, some respondents stated that UPA is an effective way to protect soil and green the city. Keeping the space for UPA is crucial for the vitality of urban and peri-urban areas. In general, respondents seem to reveal a lack of legal and formal recognition of UPA within planning tools and urban policies.

4.2. Learning from experience: UPA into urban planning and policies

According to our study of 44 cities/city regions identified because of their UPA practices, the majority do not have a dedicated policy tool to establish or manage UPA. In most cases, UPA is included within policy tools meant for other issues (for instance, food or urban greenery). However, the analysis of international case studies provides a set of policy tools and urban planning approaches supporting UPA development (Figure 6), which are tested in different spatial governance and planning systems.

4.2.1. Thematic domain of urban policies related to UPA

Focusing on those cities that have an intentional policy for UPA, it is noticeable that themes addressed by urban policies related to UPA are very varied, including climate adaptation and/or mitigation, urban nature protection, urban forestry, local community development, urban renewal, health and education policies. Although some policies address several issues at the same time, in the collected case studies UPA is mainly addressed by policies concerning food (more than 60% of the selected case studies), urban green development and management (approximately 50%), as well as urban-rural linkages (about 30%).

4.2.1.1. Food policies. In the last two decades, cities or city-regions in the Global North have developed food policies that include food strategies, charters, and plans. They were created especially as tools for encouraging UPA and achieving food safety and quality goals. While in the Global South political motivations for food policies and UPA initiatives are mainly focused on food security and self-provisioning, in the global North food strategies are oriented by different reasons, usually connected to socio-economic and environmental sustainability of food chains (Opitz *et al.*, 2016). Food policies that include UPA often relate to the quality of urban and peri-urban agri-food production, or simply aim to enhance short supply chains and alternative food networks. The 'Good Food Strategy of Brussels' (Belgium), launched in 2016, promoted urban and peri-urban agriculture in order to increase food self-sufficiency and create a more sustainable and healthier urban food system based on short chains and fresh agri-food products (Brussels Environment, Brussels Regional Public Service's Agricultural Unit, 2016; Manganelli & Moulaert, 2019). More recently, the Roma Agrifood Plan 2030 (Italy)

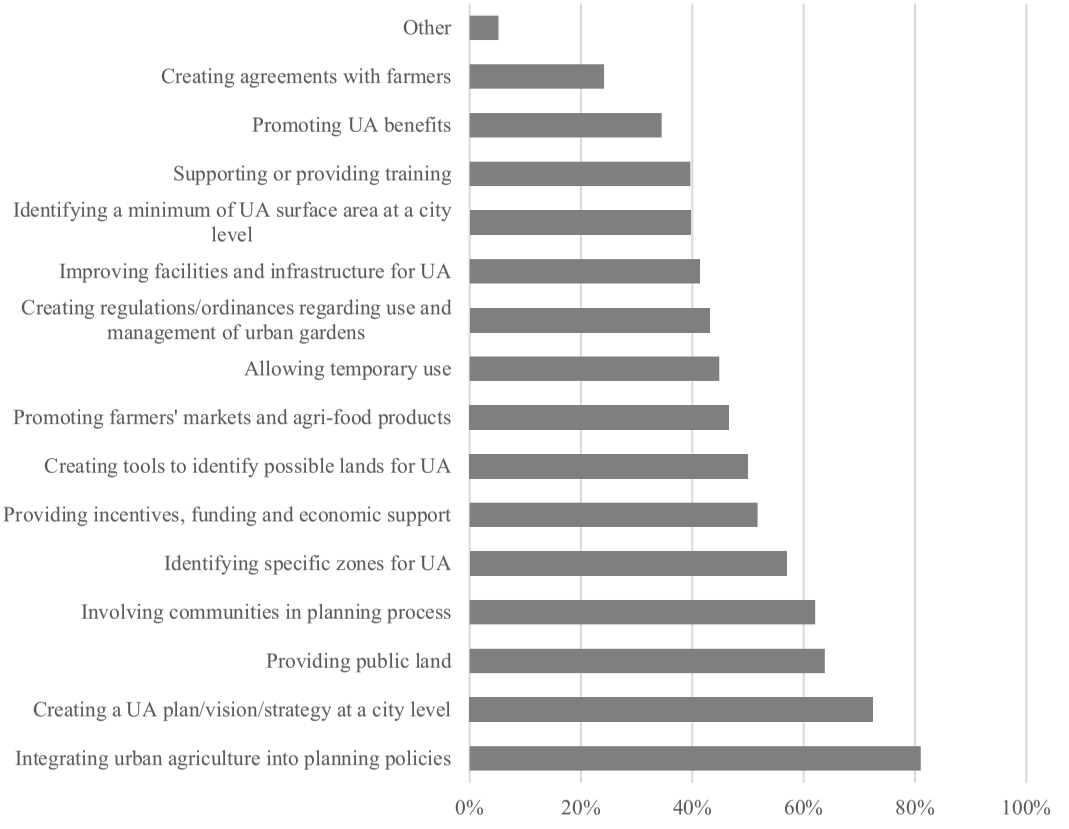

Figure 5. What public policies should do to improve urban and peri-urban agriculture according to respondents (multiple answers allowed) (reworked from: Cassatella *et al.*, 2022).

Figure 6. Map of the selected case studies (source: Cassatella *et al.*, 2022).

aims to reinforce local production and short food supply chains through local farms and agrifood businesses (City of Rome, 2021). In 2012, Rotterdam (The Netherlands) launched 'The Agenda Food and the City', a policy document that included measures for the development of new community gardens and rooftop gardens, as well as the identification of vacant sites for UPA (City of Rotterdam, 2012; Schans, 2015; Cretella & Buenger, 2016). Finally, Vancouver's strategies on food (Canada) defined specific guidelines and support for the development of several forms of UPA in public and private lands, in order to expand local food production (Huang & Drescher, 2015; Valley & Wittman, 2019).

4.2.1.2. Greening strategies. The case studies analyzed showed that UPA is considered a tool for greening the cities and a component of the urban green system that contributes to increasing the surface area and accessibility of urban green spaces, especially in the most populated areas and where land use conflict and competition are very high (Pallagst *et al.*, 2017; Contesse *et al.*, 2018; Zambrano-Prado *et al.*, 2021). For instance, Sydney has defined a greening strategy that includes UPA and a policy and guidelines on community gardens (City of Sydney, 2016a, 2016b, 2021a, 2021b, Corkery *et al.*, 2021). In 2015, the City of Taipei (Taiwan) launched the 'Garden city initiative' in order to encourage and support the development of community gardens, rooftop gardens and school gardens (Hou, 2020). Most recently, the city of Turin (Italy) adopted the 'Green Infrastructure Strategic Plan' that includes specific goals for developing and managing urban gardens and urban farms (City of Turin, 2020).

4.2.1.3. Policies to strengthen urban-rural linkages. Public policies related to urban-rural linkages often involve UPA, especially in terms of development of socio-economic activities, provision of ecosystem services and management of natural resources (Zasada, 2011; Lange *et al.*, 2013; Organisation for Economic Cooperation and Development (OECD), 2013; Opitz *et al.*, 2016). In Europe, public policies for strengthening urban–rural partnerships can take different forms such as agreements, UA-related plans and agricultural parks, involving mainly professional agriculture. In 2009, the City of Almere developed a master plan in order to integrate UPA in the city's development plan and in the Oosterwold's residential area. Combining UPA with housing, this plan was designed considering households' needs for food and other agricultural products, as well as with the aim to promote the agricultural use of public areas and the development of organic production (Jansma & Wertheim-Heck, 2021, 2022). The 'Metropolitan Network of Agro-Parks' (MAP) in the Lisbon Metropolitan Area (LMA) is based on a network of different stakeholders and aims to contribute to food supply, as well as to plan and manage the metropolitan food system by promoting sustainable production methods and short food chains (Oliveira, 2022, 2023).

4.2.2. Spatial instruments and regulations for UPA

The analysis of case studies highlighted that UPA is established within heterogeneous spatial governance and planning systems. The UPA planning instruments put in place, within each country, are different from each other, being context-dependent tools, defined based on the nature of the instruments adopted for guiding and regulating spatial development. The character of the system (for instance, conformative, performative, etc.) has several implications for the possible integration of UPA into urban planning and for the transferability of successful urban policies from one context to another.

4.2.2.1. Plans and programs for UPA. Since the early 2000s, numerous integration tools have been tested, especially in North American cities, such as comprehensive plans, specific plans, programs and strategies. For example, Baltimore, New York and Portland have launched different plans that include UPA among other issues. In 2011, New York introduced specific recommendations on UPA into the PlaNYC 2.0, in order to increase community gardens, new farmers markets and school gardens (Cohen & Reynolds, 2014; Thomaier *et al.*, 2015; Campbell, 2016; Goodman & Minner, 2019). The City of Baltimore (2019) includes a section on UPA, promoting local food production and supporting urban farmers and gardeners (Santo *et al.*, 2014; City of Baltimore, 2019). The city of Portland has also recognized UPA as a key element of the city's Sustainable Food Program, especially through the implementation of community gardens and eco-roofs (Borrelli, 2018; McClintock *et al.*, 2021). Instead, other cities such as Rosario and Toronto developed more specific UA-related programs/plans. In 2002, the Rosario municipal government defined the Urban Agriculture Program (PAU) that is now totally integrated into Rosario's land use planning system and supports approximately 800 community gardens (FAO, 2014; Hammelman *et al.*, 2022). The Toronto action plan 'GrowTO' supports UPA in terms of education, training, promotion and provision of land (Toronto Food Policy Council TFPC, 2012; Mulligan *et al.*, 2018; Hammelman, 2019). Yarra established its first Urban Agriculture Strategy in 2011. The current strategy favors access to space for people to grow food and offer education and training on UPA and food

system approaches (City of Yarra, 2019). The recent increase of plans for UPA can be observed in different parts of the world such as Paris, Dallas and Philadelphia, among others.

4.2.2.2. Land use zones. Defining zoning tools related to UPA and understanding what UPA initiatives can be practiced and where there are other critical points for urban planning. Since 2010, many North American cities have developed zoning code languages and instruments that concern the location and management of UPA initiatives, urban gardens, urban farms and markets, as well as on-site sales (McClintock *et al.*, 2012). The identification and protection of prime farmland and functional UPA zones are the main goals of UPA zoning tools such as the Japanese Productive Green Zones (PGZ) and the European 'agricultural parks'. The first are intra-urban and agricultural areas where the same tax regulations concerning farmland are adopted, in order to preserve land from urbanization (Takatori *et al.*, 2019). As the Japanese PGZ and the Sacramento case showed, zoning may be a necessary pre-condition for applying financial incentives. Agricultural parks are often bottom-up initiatives for the management and promotion of agricultural activities in peri-urban areas (see, for instance, the Baix Llobregat Agricultural Park of Barcelona, the agrifood park network of the Lisbon Metropolitan Area, etc.). They are widespread forms, especially in Italy, Spain and France (Jarrige & Perrin, 2017; Fanfani, 2019), but also tools under development in other parts of the world such as in China (Xie *et al.*, 2020). The South Milan Agricultural Park (Italy) is designated as a protected area governed by sectoral plans for agriculture, biodiversity, and built heritage protection and enhancement.

4.2.2.3. Financial and technical tools. Financial and technical supports are very useful and popular tools for boosting and developing UPA. They can include several forms such as loans, grants and cost-sharing (Halvey *et al.*, 2021; Marini *et al.*, 2023) for urban farmers. In some North American cities, tax-related instruments such as abatements and tax exemptions are often utilized (Horst *et al.*, 2017; Meenar *et al.*, 2017). For instance, Sacramento defined 'Urban Agriculture Incentive Zones' in order to provide a reduction in property taxes for owners who guarantee they will use their urban plots for agricultural use for at least 5 years (Napawan & Townsend, 2016). Boston and Seattle also provide staff support and city-owned land for creating UPA (Horst *et al.*, 2017). Technical support is usually offered by farmers' organizations to professionals. In some European cities, hobby farmers can receive knowledge and training on how to run a farm. In Turin (Italy), the expertise on how to set up a management plan was also offered in order to bring farmers' association into an economically sustainable social enterprise.

4.2.2.4. Regulations. Many case studies have shown that regulations or ordinances are frequent policy instruments used for UPA integration. According to Horst *et al.* (2017) and McClintock *et al.* (2012), several North American cities have reformed their building codes or zoning ordinances, especially with the aim of embracing livestock farming and crop cultivation in urban areas. Detroit and New York removed unnecessary restrictions and introduced new rules and standards into the zoning codes to recognize UPA as a new land use, including for temporary use of vacant or underutilized land, as well as for the development of rooftop gardening (Horst *et al.*, 2017; Meenar *et al.*, 2017; Paddeu, 2017).

Regulations for the management of urban gardens are very widespread instruments in Europe, especially in Italian cities such as Milan, Turin, Bologna and Rome (Forte *et al.*, 2022). The city of Vilnius (Lithuania)[2] has recently introduced regulations and guidelines for urban gardening. However, according to Meenar *et al.* (2017), many UPA initiatives are still unregulated. Many European cities do not have a regulatory framework for UPA, nor zoning and animal regulations, nor a regulatory framework for land tenure.

5. Discussion

5.1. A typology of instruments for establishing and managing UPA

Based on the literature review, R&I project review, questionnaires and interviews, round-tables with experts, and partners' meetings, 44 case studies were identified and analyzed, representative of practices in Europe, America, Asia, Australia and Africa. The first result is that UPA-related planning initiatives exist all around the world. However, the role of urban planning in managing UPA has not yet been codified in any planning system.

Thanks to Questionnaire 1, we found that 58% of the UPA practices identified by the EFUA partners are not the result of public policy and that only 35% of the cities in this first sample have a specific strategy, plan or regulation on the matter. From this first survey, it was clear that 'urban planning' should be regarded in a wide sense, paying attention to whatever planning instrument affects the transformation and management of land uses such as: statutory and binding plans (for instance, city masterplans), strategic plans and programs, urban codes and regulations. Besides planning controls, monetary and non-monetary inducements are widely used and should, therefore, be considered. Regarding the scale and the administrative level of planning instruments, the municipal level is well represented, and plans and programs at the level of city-regions are rare but present interesting opportunities.

The full list of tools in use includes ordinances, regulations and funding promoted by institutional or governmental bodies, confirming the results of Halvey *et al.* (2021), who focus on the US, and of Marini *et al.* (2023), who look at the EU. Integrating the tools in use with the tools suggested by scholars (from the literature review) and by stakeholders (from the questionnaires), we propose a typology of instruments that can be used in the governance and planning process for integrating UPA into spatial policies (Figure 7).

Our scheme summarizes the heterogeneous UPA-related planning and management tools into five categories:

(a) Inventories:
- inventories of existing UPA plots and farms
- inventories of potential areas for UA, such as vacant areas, roofs or land banks

(b) Plans:
- comprehensive spatial strategies or plans that include UPA
- ad hoc strategy, plan or program for UPA
- statutory/binding masterplan that identifies UPA zones and related rules

(c) Regulations:
- ordinances, resolutions introducing rules for UPA in the zoning system

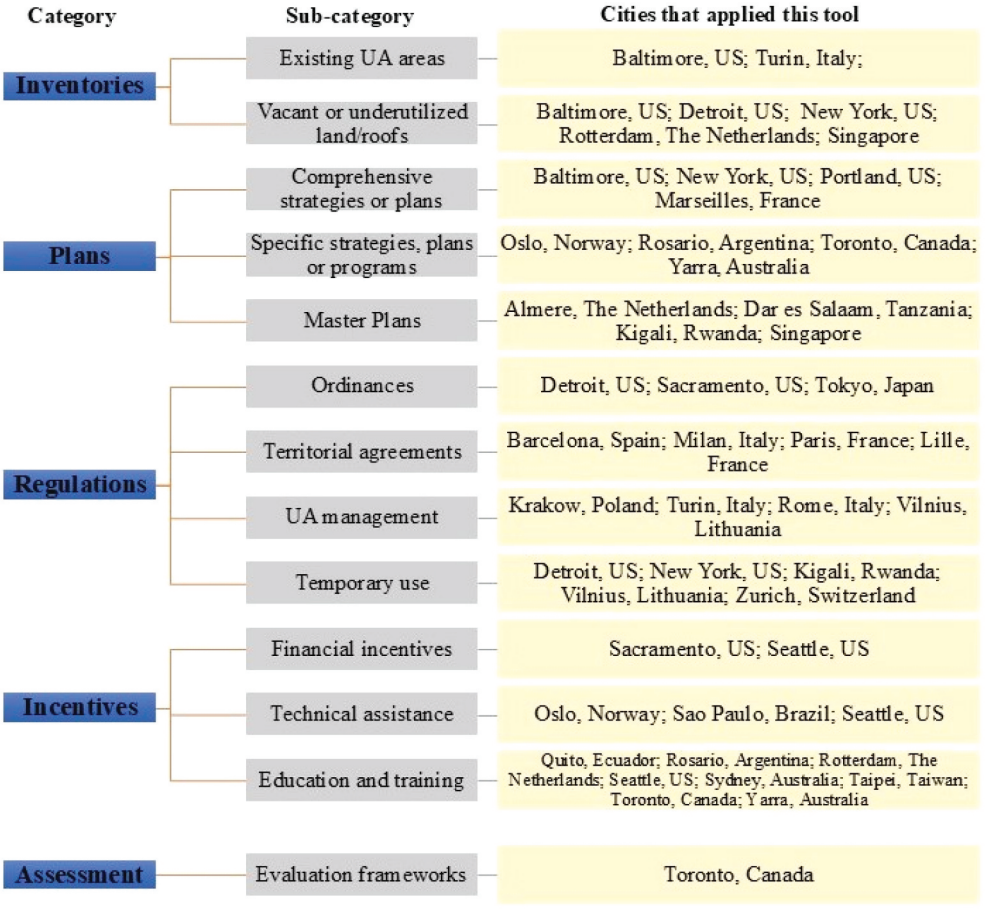

Figure 7. Typology of upa-related policy and planning instruments for establishing and managing UPA (reworked from: Cassatella *et al.*, 2022).

- schemes for agreements and contracts, among public authorities and farmers (professional or not) for the management of UPA areas
- sectoral regulations on agricultural spaces and activities, such as the management of allotment gardens, livestock upkeep, UPA as temporary use

(d) Incentives:

- financial incentives, funds, subsidies, property tax abatement and exemptions for farmers
- technical assistance to support farmers and gardeners, for instance, on business models, new techniques, environmentally friendly practices, etc.
- education and training services, especially meant to encourage UPA among citizens.

(e) Assessment instruments:

- evaluation frameworks on outcomes and impacts of UPA policies or practices to support policy making.

5.2. Zoning as a tool for the maintenance and development of UPA

Land use zoning is the most traditional device of spatial planning, particularly effective in conformative planning systems. The designation of an area as an urban or agricultural zone has consequences for the land market, taxation and the availability of dedicated policies and funding schemes. UPA-related zoning tools are heterogeneous public instruments that include not only where UPA can be developed but also the identification of incentives, protections and functional zones. Using zoning measures, prime farmland can be reserved for food production. Agricultural zones can be justified for the sake of soil protection or urbanization control against land take. Areas characterized by traditional or typical agricultural products and practices can be identified as a special zone for multifunctional agriculture and recreation, even using reservation measures meant for nature or landscape protection (see, in particular, the so-called 'agri-parks'). In some cases, regions and municipalities provide tax reductions or rebates, grants, cost-sharing, and subsidies to urban farmers for a start-up period or for longer. Those types of financial incentives that can contribute to the development and maintenance of UPA require defined spatial targets. Defining such zones, for instance, tracing boundaries between urban rural and peri-urban spaces, can be challenging.

5.3. The integration of UPA in urban planning: tools, barriers and perspectives

The case studies suggest a long list of policy tools in use, but the lack of impact and result assessment systems and other types of evidence prevent a consideration of their effectiveness. Indeed, in many case studies, it is not possible to assess the impact and results of UA-related public policies. In addition, the transferability of such tools should be carefully handled, as they have a different meaning in different planning systems (for instance, conformative or not). Each instrument should be interpreted in the context where it is applied (planning system, national legislation or programs) and linked to coexisting sectoral or comprehensive plans.

The above-mentioned set of tools can also be discussed in relation to the reasons for the failure of UPA practices and the barriers and difficulties highlighted by the respondents to our questionnaires: land conflicts, land property and accessibility, lack of 'official' and legal recognition of UPA, limitations posed by local regulations and zoning codes (especially on the urban livestock, McClintock *et al.*, 2014, or on Controlled Environment Agriculture; Marini *et al.*, 2023). Some tools are meant precisely for overcoming such barriers. The integration of more instruments seems to be the best solution, allowing for an integrated vision of the objectives and problems of the many actors involved. In the concluding section, we elaborate on a possible process to integrate several instruments, designing an intentional public policy for UPA.

Another important point is that the tools mentioned are 'urban' ones and remain separate from those handled by the agricultural sector. Some address professional farming too: in particular, fiscal instruments, and agreements. Nevertheless, it is clear that farmers and urban gardeners have different needs and deserve differentiated approaches. It should be investigated whether the existing tools are conceived and designed by experts able to represent the expertise on both urban and rural systems.

Finally, the lack of monitoring and assessment frameworks on existing practices, including those which are often put forward as best practices, is a clear limit that future research should address. If integrated into a planning process, these tools can help solve problems related to the development of UPA, such as those that emerged from the interviews and questionnaires. In fact, an intentional public policy for establishing and managing UPA should take the first step of identifying the expected benefits and providing for a monitoring of the targets.

6. Recommendations for designing urban policies for UPA

In conclusion, we would try to integrate the instruments that we identified into a comprehensive process, particularly addressed to cities and city-regions in the Global North. Public administrations may consider following all the steps to initiate a UPA policy or complementing the existing governance and planning processes to improve the situation or to introduce innovations (Figure 8). The following recommendations should be interpreted in the context where they are applied, considering socio-economic conditions, social, political and economic regimes, planning systems, as well as national legislation or programs. They could be tailored to the needs, political aims and planning contexts, selecting what is relevant and feasible, also taking into account what is already on stage. With this in mind, an ideal policy on UPA that integrates UPA into urban planning tools at a city or city-region level may include:

(1) Identifying specific governmental responsibility concerning UPA, developing a participatory process and establishing a UA committee engaging different stakeholders.
(2) Identifying existing and potential land for UPA.

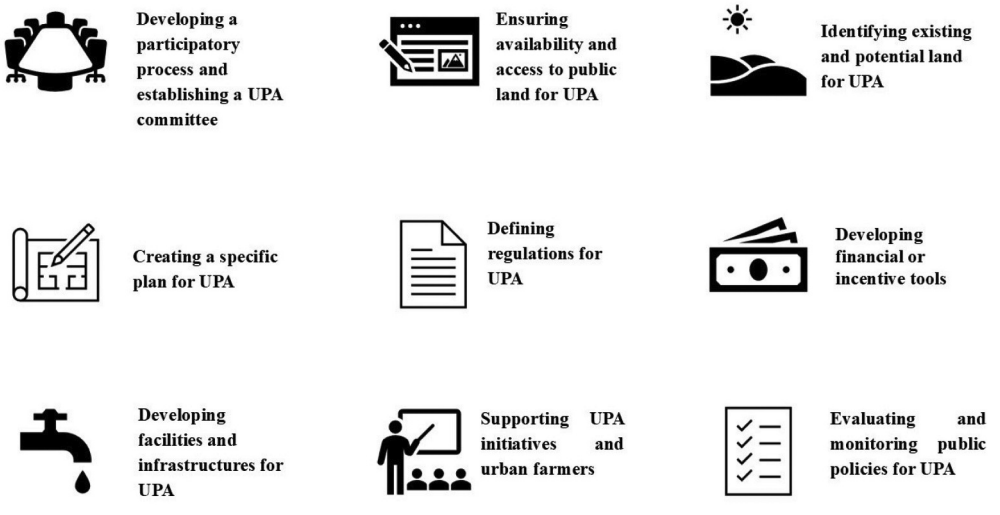

Figure 8. Policy recommendations on how to integrate UPA into local policies/how to support the installation, development and management of UPA at the local level.

(3) Ensuring availability and access to public land for UPA, by land acquisition, land banks, long-term concessions, etc. Managing potential conflicts on land allocation.
(4) Creating a specific plan for UPA, strategic in its nature, but coordinated and integrated with land use planning. The UPA Plan should identify the different UPA types (professional and not professional) and define strategies for their development. Considering the possibility of recognizing UPA as a specific zone in the land use designation system.
(5) Defining regulations, guidelines and requirements for urban gardens, rules for temporary agricultural use of vacant or underused plots, by-laws on animal and livestock management, sale activities, use of resources such as water and energy.
(6) Developing financial tools or incentives for UPA, considering professional and non-professional dimensions of UPA, as well as different available sources (for instance, social policies, agricultural policies).
(7) Developing facilities and infrastructure for UPA such as accessibility, water and energy, farmers' market sites, soil decontamination and remediation.
(8) Supporting the urban farming economy and multifunctionality such as promoting short chains, recreation activities, technical advice and assistance, training and educational activities.
(9) Evaluating and monitoring public policies for UPA, including the effectiveness and outcome of UPA-related policies (projects and plans) and specific practices, as well as the periodic reports by the UPA committee.

7. Conclusions

UPA is not codified into traditional classifications of land use designated by urban plans: it is a recent and rather ill-defined topic. Due to its heterogeneous and often hybrid nature, it is not easy to identify whether UPA is a land use that falls into the rural or the urban domain. In addition, UPA is now being addressed by sectoral policies in several fields (from food production to social wellbeing), which translate into sectoral or inter-sectoral plans and programs. Consequently, identifying univocally how spatial planning instruments should address UPA is not an easy task, and our research has therefore opted for an approach that starts from the actual practice to reflect upon the relationship between UPA and urban planning.

The collected evidence shows that whereas few cities have approved specific plans or strategies dedicated specifically to UPA, a heterogeneous set of instruments exists that includes the latter as a key component, encompassing inventories, plans, programs, regulations, incentives and assessment instruments. However, some legal restrictions and limitations, such as the lack of integration with zoning tools, as well as the land availability and usability, are brought forward as the main barriers hampering successful UPA practices by experts and practitioners. The idea of giving legitimacy to UPA through the institution of a planning zone is repeatedly brought up during interviews and focus groups, and suggested by some scholars.

Is urban agriculture becoming a new urban zone? It is worth noting that scholars who promote the creation of UA zones are not urban planners (except for APA). Some belong

to countries, such as Italy, where functional zoning goes hand in hand with a strong conformative and regulative power of masterplanning (see, for instance, recent Marini *et al.*, 2023). It is typical of emerging, weakly recognized concepts to search for a source of legitimacy. However, the efficacy of regulating emergent and multifaceted phenomena can be questioned. As we suggested at the beginning, urban agriculture belongs to the many themes whereby planning broadened its scope in recent years. Functional zoning might be useful for designating the target of sectoral measures (whether protective or incentive), thus favoring their integration with land use planning. Nevertheless, zoning has evident limitations in catching and organizing all the multiple forms and opportunities related to UPA types and benefits. In our opinion, strategic plans – coordinated with the spatial ones – seem more coherent with UPA and more able to organize different interests, actors, funding opportunities, methods of implementation and spatial targets.

In fact, the political interest in UPA has multifaceted motivations, and conflicts with other policies over priorities, space and resources may emerge. Within the urban domain, the traditional land conflict (agriculture use or building development) may be exacerbated by a new agent: the greening policies, which also ask for areas for green energy production and for nature restoration. In the urban domain, UPA is often considered an amenity space (component of the most recent plans for green infrastructure); however, it does not have the same degree of publicness of a green park, sometimes resulting in an alternative. Interestingly, the Garden City model, one of the first and most influential models in planning history, born in the age of urban hygienism, is based on the identification of the rural area needed to sustain the urban community. The long-lasting separation between urban and rural policies deserves further study in terms of how to integrate the two (for instance, designing rural policies for urban farmers and deepening the role of spatial targeting). The possible conflicts mentioned are good reasons for dealing with UPA in a comprehensive planning strategy.

In conclusion, compared to the urban–agricultural dichotomy drawn from the functional plans, a new hybrid category arises. UPA is no longer an excluded use but an intentional and identified one. However, it is too early to say that it will become standard. In the long term, as for any emerging trend, one may ask if UPA will face mainstream or decline. Research into more cases and countries is needed, as well as research into the success and failure of UPA initiatives in relation to policy design and, in particular, to the expected benefit for the public interest.

Notes

1. 'European Forum on Urban Agriculture (EFUA)' project, funded by the European Union's Horizon 2020 research and innovation programme, agreement No 101,000,681. See: https://www.efua.eu/ (last access: 2024/10/14).
2. See: URBACT website available at: https://urbact.eu/new-urban-gardens-bringing-communities-together (last access: 21/12/2021).

Acknowledgments

This paper drew on task 4.2 'In-depth analysis of urban planning strategies towards UA' (Lead: Polytechnic of Turin) of the EFUA H2020 research project and on the results revealed in

deliverable D4.2. (Authors: C. Cassatella, E. Gottero, G. Cotella, E. Pede, E. Salizzoni and S. Quaglia who contributed to the analysis of case studies). The interviews reported in this article were carried out in close cooperation with Wageningen University (WU), while questionnaire 1 was carried out by WU and Wageningen Research (WR). The authors are grateful to POLITO, WU and WR colleagues, as well as all the EFUA partners for their contribution during the research design and implementation. We would also like to thank respondents and questionnaire participants.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This project has received funding from the European Union's Horizon 2020 research and innovation pro-gramme under Grant agreement No 101000681. Horizon 2020 Framework Programme [101000681].

Credit author statement

Conceptualization: all authors; Data curation: Enrico Gottero; Formal analysis: Enrico Gottero; Funding acquisition: Claudia Cassatella; Investigation: Enrico Gottero; Methodology: Claudia Cassatella; Project administration: Claudia Cassatella; Supervision: Claudia Cassatella; Validation: Claudia Cassatella Visualization: Enrico Gottero; Writing – original draft: all authors; Writing – review and editing: all authors.

References

Berisha, E., Cotella, G., Janin Rivolin, U., & Solly, A. (2021) Spatial governance and planning systems in the public control of spatial development: A European typology, *European Planning Studies*, 29(1), pp. 181–200. doi:10.1080/09654313.2020.1726295.

Borrelli, N. (2018) Connecting food systems and urban planning: The experience of Portland, Oregon, In: Y. Cabannes & C. Marocchino (Eds) *Integrating Food into Urban Planning*, pp. 102–116 (London: UCL Press; Rome: FAO).

Brussels Environment, Brussels Regional Public Service's Agricultural Unit. (2016) *The Good Food Strategy – Towards a Sustainable Food System in the Brussels - Capital Region* (Brussels: Brussels Environment and the Brussels Regional Public Service's Agricultural Unit).

Busck, A. G., Kristensen, S. P., Præstholm, S., Reenberg, A., & Primdahl, J. (2006) Land system changes in the context of urbanisation: Examples from the peri-urban area of Greater Copenhagen, *Geografisk Tidsskrift-Danish Journal of Geography*, 106(2), pp. 21–34. doi:10.1080/00167223.2006.10649554.

Cabannes, & C. Marocchino (Eds) (2018) *Integrating Food into Urban Planning, FAO –Rome* (London: UCL Press).

Campbell, L. K. (2016) Getting farming on the agenda: Planning, policymaking, and governance practices of urban agriculture in New York City, *Urban Forestry & Urban Greening*, 19, pp. 295–305. doi:10.1016/j.ufug.2016.03.011.

Cassatella, C., & Gottero, E. (2022) *Type-benefit matrix, including set of indicators, and benefit leaflets*, H2020 project n. 101000681, European forum for a comprehensive vision on urban agriculture (EFUA), deliverable 3.2, Available at https://cordis.europa.eu/project/id/101000681//results (accessed 14 October 2024).

Cassatella, C., Gottero, E., Cotella, G., Salizzoni, E., Pede, E., & Quaglia, S. (2022) *Report on in depth-analysis on UAs role in urban planning*, H2020 project n. 101000681, European forum for a comprehensive vision on urban agriculture, deliverable 4.2, Available at https:///cordis.europa.eu/project/id/101000681/results (accessed 14 October 2024).

City of Baltimore (2019) *Baltimore Sustainability Plan's. Urban Agriculture Chapter*, Available at https://www.baltimoresustainability.org/wp-content/uploads/2019/02/Sustainability-PlanCh5-1Community.pdf (accessed 1 June 2022).

City of Rome (2021) *Agrifood Roma 2030. Piano strategico agricolo e alimentare di Roma capitale* [Agricultural and food strategic plan of Rome] (Rome: City of Rome).

City of Rotterdam (2012) *Food & the City. Stimulating Urban Agriculture in and Around Rotterdam* (Rotterdam: Town planning, Urban Planning Departement).

City of Sydney (2016a) *Community Garden Guidelines*, Available at https:///www.cityofsydney.nsw.gov.au/policy-planning-changes/community-gardens-policy-review (accessed 23 December 2021).

City of Sydney (2016b) *Community Gardens Policy*, Available at https://www.cityofsydney.nsw.gov.au/policy-planning-changes/community-gardens-policy-review (accessed 23 December 2021).

City of Sydney (2021a) *Greening Sydney Strategy*, Available at https://www.cityofsydney.nsw.gov.au/policy-planning-changes/community-gardens-policy-review (accessed 23 December 2021).

City of Sydney (2021b) *Our City Farm Plan*, Available at https://www.cityofsydney.nsw.gov.au/policy-planning-changes/community-gardens-policy-review (accessed 23 December 2021).

City of Turin (2020) *Piano strategico dell'infrastruttura verde* [Strategic plan for green infrastructure], Available at http://www.comune.torino.it/verdepubblico/ (accessed 29 October 2021).

City of Yarra (2019) *Yarra's Urban Agriculture Strategy 2019–2023*, Available at: https://www.yarracity.vic.gov.au/services/take-climate-action/grow-your-own-food/urban-agriculture-strategy (accessed 27 September 2022).

Cohen, N., & Reynolds, K. (2014) Urban agriculture policy making in New York's "New political spaces": Strategizing for a participatory and Representative system, *Journal of Planning Education and Research*, 34(2), pp. 221–234. doi:10.1177/0739456X14526453.

Contesse, M., van Vliet, B. J. M., & Lenhart, J. (2018) Is urban agriculture urban green space? A comparison of policy arrangements for urban green space and urban agriculture in Santiago de Chile, *Land Use Policy*, 71, pp. 566–577. doi:10.1016/j.landusepol.2017.11.006.

Corkery, L., Osmond, P., & Williams, P. (2021) Legal frameworks for urban agriculture: Sydney case study, *Journal of Property, Planning and Environmental Law*, 13(3), pp. 218–235. doi:10.1108/JPPEL-06-2020-0030.

Cretella, A., & Buenger, M. S. (2016) Food as creative city politics in the city of Rotterdam, *Cities*, 51, pp. 1–10. doi:10.1016/j.cities.2015.12.001.

Davoudi, S., & Stead, D. (2002) Urban-rural relationships: An introduction and brief history, *Built Environment*, 28(4), pp. 269–277.

De Zeeuw, H., Guendel, S., & Waibel, H. (2000) The integration of agriculture in urban policies, *Growing Cities, Growing Food. Urban Agriculture on the Policy Agenda*, Vol. 1, pp. 161–180.

Fanfani, D. (2019) Agricultural park in Europe as tool for agri-urban policies and design: A critical overview, In: E. Gottero (Ed) *Agrourbanism Tools for Governance and Planning of Agrarian Landscape*, pp. 149–169 (Cham: Springer).

FAO (2014) *Growing greener cities in Latin America and the Caribbean. An FAO report on urban and peri-urban agriculture in the region*, Rome.

FAO, Rikolto and RUAF (2022) *Urban and Peri-Urban Agriculture Sourcebook – from Production to Food Systems* (Rome: FAO and Rikolto).

Forte, A., Gottero, E., & Cassatella, C. (2022) How urban food gardening fits into city planning. Evidences from Italy, *TeMA Journal of Land Use, Mobility and Environment*, 15(3), pp. 397–413.

Goodman, W., & Minner, J. (2019) Will the urban agricultural revolution be vertical and soilless? A case study of controlled environment agriculture in New York City, *Land Use Policy*, 83, pp. 160–173. doi:10.1016/j.landusepol.2018.12.038.

Halvey, M. R., Santo, R. E., Lupolt, S. N., Dilka, T. J., Kim, B. F., Bachman, G. H., & Nachman, K. E. (2021) Beyond backyard chickens: A framework for understanding municipal urban agriculture policies in the United States, *Food Policy*, 103, pp. 102013. doi:10.1016/j.foodpol.2020.102013.

Hammelman, C. (2019) Challenges to supporting social justice through food system governance: Examples from two urban agriculture initiatives in Toronto, *Environment and Urbanization*, 31 (2), pp. 481–496. doi:10.1177/0956247819860114.

Hammelman, C., Shoffner, E., Cruzat, M., & Lee, S. (2022) Assembling agroecological socio-natures: A political ecology analysis of urban and peri-urban agriculture in Rosario, Argentina, *Agriculture and Human Values*, 39(1), pp. 371–383. doi:10.1007/s10460-021-10253-7.

Horst, M., McClintock, N., & Hoey, L. (2017) The intersection of planning, urban agriculture, and food justice: A review of the literature, *Journal of the American Planning Association*, 83(3), pp. 277–295. doi:10.1080/01944363.2017.1322914.

Hou, J. (2020) Governing urban gardens for resilient cities: Examining the 'Garden City Initiative' in Taipei, *Urban Studies*, 57(7), pp. 1398–1416. doi:10.1177/0042098018778671.

Huang, D., & Drescher, M. (2015) Urban crops and livestock: The experiences, challenges, and opportunities of planning for urban agriculture in two Canadian provinces, *Land Use Policy*, 43, pp. 1–14. doi:10.1016/j.landusepol.2014.10.011.

Ilieva, R. T. (2014) Food and planning: Reimaging the city of tomorrow? *Territorio*, (71), pp. 35–42. doi:10.3280/TR2014-071005.

Jansma, J. E., Veen, E. J., Vaandrager, L., Muller, D., & Berg, W. V. D. (2021) UA typology update, H2020 project n. 101000681, European forum for a comprehensive vision on urban agriculture (EFUA), deliverable 3.1, Available at https://cordis.europa.eu/project/id/101000681//results (accessed 14 October 2024).

Jansma, J. E., & Wertheim-Heck, S. C. O. (2021) Thoughts for urban food: A social practice perspective on urban planning for agriculture in Almere, the Netherlands, *Landscape and Urban Planning*, 206, pp. 103976. doi:10.1016/j.landurbplan.2020.103976.

Jansma, J. E., & Wertheim-Heck, S. C. O. (2022) Feeding the city: A social practice perspective on planning for agriculture in peri-urban Oosterwold, Almere, the Netherlands, *Land Use Policy*, 117, pp. 117. doi:10.1016/j.landusepol.2022.106104.

Jarrige, F., & Perrin, C. (2017) L'Agriparc: une innovation pour l'agriculture des territoires urbains?, *Revue d'Économie Régionale and Urbaine*, 3(3), pp. 537–562. doi:10.3917/reru.173.0537.

Jensen, P. D., & Orfila, C. (2021) Mapping the production-consumption gap of an urban food system: An empirical case study of food security and resilience, *Food Security*, 13(3), pp. 551–570.

Lange, A., Piorr, A., Siebert, R., & Zasada, I. (2013) Spatial differentiation of farm diversification: How rural attractiveness and vicinity to cities determine farm households' response to the CAP, *Land Use Policy*, 31, pp. 136–144. doi:10.1016/j.landusepol.2012.02.010.

Langemeyer, J., Madrid-Lopez, C., Mendoza Beltran, A., & Villalba Mendez, G. (2021) Urban agriculture — a necessary pathway towards urban resilience and global sustainability?= *Landscape and Urban Planning*, 210, pp. 104055. doi:10.1016/j.landurbplan.2021.104055.

Lohrberg, F., Lička, L., Scazzosi, L., & Timpe, A. (2016) *Urban Agriculture Europe* (Berlin: Jovis).

Lovell, S. T. (2010) Multifunctional urban agriculture for sustainable land use planning in the United States, *Sustainability*, 2(8), pp. 2499–2522.

Lucertini, G., & Di Giustino, G. (2021) Urban and peri-urban agriculture as a tool for food security and climate change mitigation and adaptation: The case of Mestre, *Sustainability*, 13(11), pp. 5999. doi:10.3390/su13115999.

Manganelli, A., & Moulaert, F. (2019) Scaling out access to land for urban agriculture. Governance hybridities in the Brussels-Capital region, *Land Use Policy*, 82, pp. 391–400. doi:10.1016/j.landusepol.2018.12.015.

Marini, M., Caro, D., & Thomsen, M. (2023) Investigating local policy instruments for different types of urban agriculture in four European cities: A case study analysis on the use and

effectiveness of the applied policy instruments, *Land Use Policy*, 131, pp. 106695. doi:10.1016/j.landusepol.2023.106695.

McClintock, N., Miewald, C., & McCann, E. (2021) Governing urban agriculture: Formalization, resistance and Re-visioning in two 'green' cities, *International Journal of Urban and Regional Research*, 45(3), pp. 498–518. doi:10.1111/1468-2427.12993.

McClintock, N., Pallana, E., & Wooten, H. (2014) Urban livestock ownership, management, and regulation in the United States: An exploratory survey and research agenda, *Land Use Policy*, 38, pp. 426–440. doi:10.1016/j.landusepol.2013.12.006.

McClintock, N., Wooten, H., & Brown, A. (2012) Toward a food policy "first step" in Oakland, California: A food policy Council's efforts to promote urban agriculture zoning, *Journal of Agriculture, Food, Systems, and Community Development*, pp. 15–42. doi:10.5304/jafscd.2012.024.009.

Meenar, M., Morales, A., & Bonarek, L. (2017) Regulatory practices of urban agriculture: A connection to planning and policy, *Journal of the American Planning Association*, 83(4), pp. 389–403. doi:10.1080/01944363.2017.1369359.

Monaco, F., Zasada, I., Wascher, D., Glavan, M., Pintar, M., Schmutz, U., Mazzocchi, C., Corsi, S., & Sali, G. (2017) Food production and consumption: City regions between localism, agricultural land displacement, and economic competitiveness, *Sustainability*, 9(1), p. 96. doi:10.3390/su9010096.

Morgan, K. (2015) Nourishing the city: The rise of the urban food question in the global north, *Urban Studies*, 52(8), pp. 1379–1394. doi:10.1177/0042098014534902.

Mubvami, T., Mushamba, S., & De Zeeuw, H. (2006) Integration of agriculture in urban land use planning, in: R. van Veenhuizen (Ed) *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities*, pp. 54–74. (Silang, the Philippines: RUAF, IIRR and IDRC).

Mulligan, K., Archbold, J., Baker, L., Elton, S., & Cole, D. (2018) Toronto municipal staff and policy-makers' views on urban agriculture and health: A qualitative study, *Journal of Agriculture, Food, Systems, and Community Development*, pp. 133–156. doi:10.5304/jafscd.2018.08B.001.

Napawan, N. C., & Townsend, S. A. (2016) The landscape of urban agriculture in California's capital, *Landscape Research*, 41(7), pp. 780–794. doi:10.1080/01426397.2016.1151484.

Oliveira, R. (2022) *The agrofood parks network of the Lisbon Metropolitan Area*, EFUA Conference Rome (online), 29–30 March 2022.

Oliveira, R. (2023) Mettere in atto la pianificazione alimentare nell'area della città di Lisbona In: Implementing food planning in the Lisbon city area, D. Fanfani & A. Venturi (Eds) *Il parco agricolo della piana Firenze-Prato. Strategie, strumenti e tempi per l'attuazione*, pp. 35–42. (Firenze: ANCI Toscana).

Olsson, E. G. A., Kerselaers, E., Kristensen, L. S., Primdahl, J., Rogge, E., & Wästfelt, A. (2016) Peri-urban food production and its relation to urban resilience, *Sustainability*, 8(12), pp. 13–40.

Opitz, I., Berges, R., Piorr, A., & Krikser, T. (2016) Contributing to food security in urban areas: Differences between urban agriculture and peri-urban agriculture in the global north, *Agriculture and Human Values*, 33(2), pp. 341–358. doi:10.1007/s10460-015-9610-2.

Organisation for Economic Cooperation and Development (OECD) (2013) *Rural-Urban Partnerships. An Integrated Approach to Economic Development* (OECD Publishing).

Paddeu, F. (2017) Legalising urban agriculture in Detroit: A contested way of planning for decline, *The Town Planning Review*, 88(1), pp. 109–129. doi:10.3828/tpr.2017.9.

Pallagst, K., Fleschurz, R., & Trapp, F. (2017) Greening the shrinking city—policies and planning approaches in the USA with the example of Flint, Michigan, *Landscape Research*, 42(7), pp. 716–727. doi:10.1080/01426397.2017.1372398.

Piorr, A., Ravetz, J., & Tosics, I. (Eds) (2011) *Peri-Urbanisation in Europe. Towards a European Policy to Sustain Urban- Rural Futures, Synthesis Report* (Copenhagen: University of Copenhagen/Academic Books Life Sciences).

Pothukuchi, K., & Kaufman, J. L. (2000) The food system: A stranger to the planning field, *Journal of the American Planning Association*, 66(2), pp. 113–124. doi:10.1080/01944360008976093.

Provè, C. (2018) *The Politics of Urban Agriculture. An International Exploration of Governance, Food Systems, and Environmental Justice*. PhD-thesis (Ghent: Ghent University.
Quon, S. (1999) *Planning for urban agriculture: A review of tools and strategies for urban planners. Cities Feeding People Series* Report No. 28 (International Development Research Centre). Available at https://idl-bnc-idrc.dspacedirect.org/server/api/core/bitstreams/c556be21-36a7-4500-b5a1-05e9f1fe5731/content (accessed 04 March 2025).
Santo, R., Yong, R., & Palmer, A. (2014) Collaboration meets opportunity: The Baltimore food policy initiative, *Journal of Agriculture, Food, Systems, and Community Development*, 4(3), pp. 193–208. doi:10.5304/jafscd.2014.043.012.
Schans, J. W. V. D. (2015) Developing the Rotterdam city region food system: Acting and thinking at the same time, *Urban Agriculture Magazine*, 29, pp. 14–17.
Seto, K. C., Sánchez-Rodríguez, R., & Fragkias, M. (2010) The new geography of contemporary urbanization and the environment, *Annual Review of Environment and Resources*, 35(1), pp. 167–194. doi:10.1146/annurev-environ-100809-125336.
Sioen, G. B., Sekiyama, M., Terada, T., & Yokohari, M. (2017) Post-disaster food and nutrition from urban agriculture: A self-sufficiency analysis of Nerima ward, Tokyo, *International Journal of Environmental Research and Public Health*, 14(7), pp. 748. doi:10.3390/ijerph14070748.
Sioen, G. B., Terada, T., Sekiyama, M., & Yokohari, M. (2018) Resilience with mixed agricultural and urban land uses in Tokyo, Japan, *Sustainability*, 10(2), pp. 435. doi:10.3390/su10020435.
Smith, J. P., Li, X., & Turner, B. L. (2017) Lots for greening: Identification of metropolitan vacant land and its potential use for cooling and agriculture in Phoenix, AZ, USA, *Applied Geography*, 85, pp. 139–151. doi:10.1016/j.apgeog.2017.06.005.
Smith, J. P., Meerow, S., & Turner, B. L. (2021) Planning urban community gardens strategically through multicriteria decision analysis, *Urban Forestry & Urban Greening*, 58, pp. 58. doi:10.1016/j.ufug.2020.126897.
Specht, K., Zoll, F., & Siebert, R. (2016) Application and evaluation of a participatory "open innovation" approach (ROIR): The case of introducing zero-acreage farming in Berlin, *Landscape and Urban Planning*, 151, pp. 45–54. doi:10.1016/j.landurbplan.2016.03.003.
Takatori, C., Kawaguchi, N., & Shimitzu, H. (2019) Managing urban and rural agricultural landscape processes in Japan, In: E. Gottero (Ed), *Agrourbanism. Tools for Governance and Planning of Agrarian Landscape*, pp. 27–44 (Cham: Springer).
Tapia, C., Randall, L., Wang, S., & Aguiar Borges, L. (2021) Monitoring the contribution of urban agriculture to urban sustainability: An indicator-based framework, *Sustainable Cities and Society*, 74, pp. 103130. doi:10.1016/j.scs.2021.103130.
Thibert, J. (2012) Making local planning work for urban agriculture in the North American context: A view from the ground, *Journal of Planning Education and Research*, 32(3), pp. 349–357.
Thomaier, S., Specht, K., Henckel, D., Dierich, A., Siebert, R., Freisinger, U. B., & Sawicka, M. (2015) Farming in and on urban buildings: Present practice and specific novelties of zero-acreage farming (ZFarming), *Renewable Agriculture and Food Systems*, 30(1), pp. 43–54. doi:10.1017/S1742170514000143.
Toronto Food Policy Council (TFPC) (2012) *GrowTO: An Urban Agriculture Action Plan for Toronto* (Toronto: Food Policy Council).
UN-Habitat. (2017) *Implementing the New Urban Agenda by Strengthening Urban-Rural Linkages - Leave No One and No Space Behind, United Nations Human Settlements Programme (UN-Habitat)* (Nairobi KENYA).
UN-Habitat. (2019) *Urban-Rural Linkages: Guiding Principles. Framework for Action to Advance Integrated Territorial Development, Produced by the Regional and Metropolitan Planning Unit, Urban Planning and Design Branch United Nations Human Settlements Programme (UN-Habitat)* (Nairobi, KENYA: UN-Habitat).
United Nations (UN) (2020) *The least developed countries report 2020* (New York: United Nations Publications
Valley, W., & Wittman, H. (2019) Beyond feeding the city: The multifunctionality of urban farming in Vancouver, BC, *City, Culture & Society*, 16, pp. 36–44. doi:10.1016/j.ccs.2018.03.004.

Wang, N., Zhu, L., Bing, Y., Chen, L., & Fei, S. (2021) Assessment of urban agriculture for evidence-based food planning: A case study in Chengdu, China, *Sustainability*, 13(6), pp. 3234. doi:10.3390/su13063234.

Xie, M., Li, M., Li, Z., Xu, M., Chen, Y., Wo, R., & Tong, D. (2020) Whom do urban agriculture parks provide landscape services to and how? A case study of Beijing, China, *Sustainability*, 12 (12), pp. 4967. doi:10.3390/su12124967.

Zambrano-Prado, P., Pons-Gumí, D., Toboso-Chavero, S., Parada, F., Josa, A., Gabarrell, X., & Rieradevall, J. (2021) Perceptions on barriers and opportunities for integrating urban agri-green roofs: A European Mediterranean compact city case, *Cities*, 114, pp. 114. doi:10.1016/j.cities.2021.103196.

Zasada, I. (2011) Multifunctional peri-urban agriculture—A review of societal demands and the provision of goods and services by farming, *Land Use Policy*, 28(4), pp. 639–648. doi:10.1016/j.landusepol.2011.01.008.

Appendices

Appendix A. List of the main questions and answers related to the relationship between UPA and Urban Planning (Questionnaire 3)

In your opinion, what main urban needs and/or demands can be addressed through urban agriculture?

- Social
- Cultural
- Environmental
- Climate
- Food
- Health
- Well-being
- Economic
- Other . . .

In your opinion, which are the main barriers to maintain and expand urban and peri-urban agriculture?

- To increase income
- To save money or affordability
- To be food self-sufficient
- To produce fresh and healthy food
- To produce organic/pesticide-free food or in more environmentally sustainable way
- To socialise with neighbours
- To build or develop a sense of community
- For recreational purposes
- To relax
- To improve my state of mind or mental health
- To improve physical health
- To improve my garden look
- To live in a more environmentally sustainable way
- For educational purposes
- To increase dietary diversity (vegetarian, vegan, etc.)
- Other . . .

In your opinion, what should public policies do to improve urban and peri-urban agriculture?

- Integrating urban agriculture into planning policies
- Identifying specific zones for UA
- Identifying a minimum of UA surface area at a city level
- Creating a UA plan/vision/strategy at a city level
- Creating regulations/ordinances regarding use and management of urban gardens
- Creating tools to identify possible sites or inventories of potential vacant and under-utilized lands for UA
- Promoting farmers' markets and agri-food products
- Promoting UA benefits
- Allowing temporary use
- supporting or providing training
- involving communities in planning process
- improving facilities and infrastructures for UA
- providing incentives, funding and economic support
- providing public land
- creating agreements with farmers
- Other . . .

Appendix B. List of case studies (Reworked from: Cassatella et al., 2022)

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
01	Almere	The Master Plan of Oosterwold	X			X			X					X			X			X				
02	Baltimore	Baltimore Sustainability Plan	X			X	X										X	X						X
03	Barcelona	The Baix Llobregat Agricultural Park				X			X			X									X			
04	Birmingham	Birmingham Food Charter	X											X		X	X		X					
05	Bobo-Dioulasso	Bobo-Dioulasso Greenways Strategy	X	X		X				X	X		X	X			X							X
06	Bologna	Parco Città Campagna			X				X	X											X			

(*Continued*)

(Continued).

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
07	Bristol	Blu Finger Alliance			X				X					X			X	X	X					
08	Brussels	Good Food Strategy	X							X							X				X			
09	Dar es Salaam	Dar es Salaam 2012 – 2032 Master Plan				X											X	X						X
10	Detroit	Urban Agriculture Ordinance				X		X							X									X
11	Gent	Ghent en Garde	X														X				X			
12	Grenoble	Metropolitan Agricultural Strategy 2015–2020	X						X		X						X		X					

(*Continued*)

(Continued).

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
13	Havana	Urban and Periurban Integrated Agriculture Program	X	X								X					X							X
14	Kigali	Kigali Master Plan	X			X									X		X							X
15	Lisbon	The agrofood parks network of the Lisbon Metropolitan Area	X		X				X	X							X				X			
16	London	London Plan	X					X		X				X					X					
17	Marseilles	Plan d'action Métropolitain en faveur de l'agriculture urbaine	X						X	X				X			X		X					

(*Continued*)

(Continued).

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
18	Milan	Milano Metropoli Rurale	X	X					X					X							X			
19	Minneapolis	Urban agriculture policy plan		X		X								X			X							X
20	Montpellier	Les jardins familiaux Programme		X						X				X					X					
21	Munich	Municipal vegetable gardens			X				X	X							X			X				
22	New York	PlaNYC 2.0		X		X		X		X							X							X
23	Oslo	Sprouting Oslo	X							X				X			X		X					
24	Paris	Charte Main Verte des jardins partagés		X						X				X					X					

(*Continued*)

(Continued).

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
25	Portland	City of Portland ‘s Sustainable Food Program		X		X	X	X	X		X	X				X	X							X
26	Quito	Participatory Urban Agriculture Program (AGRUPAR)		X													X							X
27	Roma	Roma Agrifood Plan 2030	X				X		X				X	X		X	X				X			
28	Rosario	Urban agriculture program		X						X														X
29	Rotterdam	The Agenda Food and the City	X														X			X				

(*Continued*)

(Continued).

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
30	Sacramento	Urban agriculture incentive zones				X		X								X		X						X
31	Sao Paulo	Connect the Dots			X				X								X							X
32	Seattle	Seattle P-Patch Community Gardening Program	X	X						X								X						X
33	Singapore	The high-tech farming vision	X	X		X									X		X							X
34	Sydney	Community Gardens Policy and guidelines	X							X					X									X
35	Taipei	Garden City Initiative		X						X														X

(*Continued*)

(Continued).

			Type of public policy						Thematic domain										Planning system					
n	City	denomination	Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
36	Thessaloniki	Kipos3			X					X				X	X						X			
37	Tokyo	Productive Green Zones				X			X	X														X
38	Toronto	GrowTO: An Urban Agriculture Action Plan	X														X							X
39	Troyan	Municipal vegetable gardens and orchards			X					X				X		X	X				X			
40	Turin	Strategic plan for green infrastructure	X					X		X											X			
41	Vancouver	Urban agriculture guidelines and strategies	X			X		X		X							X							X

(*Continued*)

(Continued).

n	City	denomination	Type of public policy							Thematic domain										Planning system						
			Strategy/vision	Plan/Programme	Project	Land-use zoning instrument	Sectoral policy	Regulation	urban-rural partnership	urban green development and management	climate adaptation and/or mitigation	urban nature protection	urban forestry	local community development	urban renewal	health and education policies	Food strategies	Other	state-led system	market-led neo-performative system	conformative system	proto-conformative systems	misled performative systems	Other
42	Vilnius	Community gardens regulations						X		X										X				
43	Yarra	Urban Agriculture Strategy 2019–2023	X									X		X		X	X	X						X
44	Zurich	Policies Fostering Multifunctional Urban Agriculture	X							X		X								X				