

A SCOPING/MAPPING LITERATURE REVIEW ABOUT URBAN AND PERIURBAN AGRICULTURE (UPA)

UMA REVISÃO BIBLIOGRÁFICA DO TIPO SCOPPING/ MAPPING SOBRE A AGRICULTURA URBANA E PERIURBANA

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ABSTRACT

The world is undergoing an accelerated urbanization process marked by social and environmental imbalances. In this context, urban and periurban agriculture (UPA) emerges as an alternative to sustainable urbanization mainly due to its contribution to food security, reduction of environmental impact, revitalization of urban areas, integration of households and physical and psychological well-being increasing. The purpose of this paper is to understand how academic literature deals with urban and periurban agriculture. For that, a scoping / mapping literature review was carried out and its results were presented after identification of relevant scientific studies on UPA, its main aspects, ways in which the term has been defined; and discussion about themes from the selected articles. After this review, the conclusions are: the scientific production on the subject is undergoing high growth rates in recent years; the relationship between UPA and urban dynamics is more important for the definition of UPA than the location of agriculture; and that the aspects that authors found most interesting are: concept and panorama, urban planning and governance, quantitative potential, environment, risk of contamination and techniques and productivity.

Keywords: urban and periurban agriculture, urban planning, governance, systematic literature review.

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RESUMO

O mundo passa por um acelerado processo de urbanização marcado por desequilíbrios sociais e ambientais. Nesse contexto, a agricultura urbana e periurbana (AUP) surge como uma alternativa para a urbanização sustentável devido, principalmente, à sua contribuição para o aumento da segurança alimentar, redução de impacto ambiental, revitalização de áreas urbanas, “desalienação” dos moradores e aumento do bem-estar físico e psicológico. O objetivo deste artigo é compreender como a literatura acadêmica trata o tema agricultura urbana e periurbana. Para tanto, foi realizada uma revisão bibliográfica do tipo scoping/mapping) e seus resultados foram apresentados a partir da identificação de trabalhos científicos relevantes sobre AUP, principais aspectos, formas como o termo vem sendo definido; discussão sobre os artigos selecionados. Após a revisão, conclui-se que a produção científica sobre o tema apresenta alto crescimento nos últimos anos, que na definição da AUP, mais importante do que a localização da agricultura é a sua relação com a dinâmica urbana e que os aspectos de mais interesse dos autores são: conceito e panorama, planejamento urbano e governança, potencial quantitativo, meio ambiente, risco de contaminação e técnicas e produtividade.

Palavras-chave: agricultura urbana e periurbana, planejamento urbano, governança, revisão sistemática da literatura.

1. INTRODUCTION

Urban and periurban agriculture (UPA) is defined as agricultural production that takes place within and on the edges of urban areas and that is intended directly for consumption of a city inhabitants (MOUGEOT, 2000). The integration of UPA with the economic, social and environmental dynamics of a city is its the main feature. This integration occurs in several ways: zoning and land use management, survival and food security strategies, sustainability guidelines, food distribution system, among others (MOUGEOT, 2000).

The world is undergoing an unprecedented urbanization process. In a century, the proportion of its population living in urban areas jumped from 15% to 50%, making cities the main human habitat. The size of cities also saw an unprecedented expansion, by 1990 the world's 100 largest cities housed 540 million people (DEELSTRA; GIRARDET, 2000).

Despite the benefits and attention it has been receiving from policy makers (MOUGEOT, 2006), data on UPA are still scarce and incomplete (MARTELLOZZO et al., 2014. HABERMAN et al., 2014; ZEZZA; TASCIOTTI (2010) 2010). In addition to the lack of data, the analysis of UPA is hampered by its heterogeneity, in various angles of analysis: interpretation meanings (MCCLINTOCK et al., 2013), sites where it is practiced (Saha and Eckelman, 2017), governance (MCCLINTOCK et al., 2013), and employed techniques (HABERMAN et al., 2014).

In a scenario in which cities consume too much resource and generate excessive waste - including food consumption - urban agriculture is seen as an activity that can contribute to a more sustainable future for cities (DEELSTRA; GIRARDET 2000).

In this context, urban and periurban agriculture (“UPA”) has been drawing the attention of governments and policy makers in response to environmental and social imbalances (MOUGEOT, 2006). UPA emerges as an alternative for sustainable urbanization, mainly due to its contribution to the increase of food security (ZEZZA; TASCIOTTI, 2010), reduction of environmental impact (SPECHT et al., 2014), reduction and reuse of waste. (KULAK et al., 2013), revitalization of urban areas (MENDES et al., 2008), household integration in cities (McCLINTOCK et al., 2013) and increase in the physical and psychological well-being (BROWN; JAMETON 2000).

According to Saha and Eckelman (2017), Colasanti and Hamm (2010), Orsini et al. (2014) and Haberman et al. (2014), some urban centers have the potential to produce a signif-

ificant amount of food. This could result from a multiplication between the harvested area and productivity per square meter (SAHA and ECKELMAN, 2017; HABERMAN et al., 2014). Saha and Eckelman (2017), Colasanti and Hamm (2010), Orsini et al. (2014) and Haberman et al. (2014), after making simulations considering various scenarios, suggested that Boston, Detroit, Bologna and Montreal, produce, respectively, 100%, 31%, 77% and 379% of the amount of vegetables and fruits consumed in these cities.

São Paulo is another example of a city with great potential of food production through urban agriculture. The city's 1st Municipal Food and Nutrition Security Plan (2016-2020) reports that the city has 222 km² of arable land. Based on the yield projection for conventional agriculture of 1.35 kg / m² / year pointed out by Saha and Eckelman (2017), it is possible to draw an approximation and to conclude that approximately 300 billion kilograms per year of fruits and vegetables could be produced in the city. The value is relevant compared to the recommended consumption. Taking into account the World Health Organization (WHO) recommendation of 400 grams of fruits and vegetables per day per inhabitant and the number of 12 million inhabitants of the city of São Paulo, the city's demand can reach 1.8 trillion pounds of fruits and vegetables a year.

Aspects such as quantitative potential, environment, contamination risk, techniques, productivity, urban planning and governance have been addressed by several authors in the literature. This study performs a scoping / mapping bibliographic review (PARÉ et al., 2015) of Urban and Periurban Agriculture theme, aiming to understand how the academic literature, especially scientific articles, treat the theme of urban and periurban agriculture, answering as well to three secondary questions: (i) what is the general overview on the number of scientific articles produced on the subject and its variation in recent years? (ii) what is the definition of the term urban and periurban agriculture provided by literature? (iii) which aspects of UPA are of greatest interest to the authors? In addition to answering the posed questions, this study seeks to conduct a discussion on the main themes found in the articles, used by the authors to characterize the phenomenon.

This paper is structured as follows: section 2 presents literature review. Section 3 presents the methodological approach. In section 4, we present the results and discussion, and in the last section, we state the final considerations.

2. LITERATURE REVIEW

Paré et al. (2015) describe nine types of literature reviews, depending on the objectives to be achieved. These nine types are grouped into four categories (Table 1): summarization of prior knowledge; data aggregation or integration; explanation building; and critical assessment of extant literature. The summarization category is intended to provide a pathway to the start of deeper reviews. Review types under this category allow us to point out related areas of work, inspire new theoretical models and direct future research efforts, highlighting unexplored areas, controversies and trends. In this group the scoping / mapping review is the most comprehensive, providing an initial indication of the size and potential nature of the available literature on the topic of interest. It allows the researcher to examine the extent and scope of research activities, but it is not an appropriate type of literature review to explore the research quality. Levac et al. (2010) recognize the challenges of assessing quality among the wide range of published gray literature that can be included in the scope. The second type of review in this category - narrative reviews - includes reviews that are selective, not involving systematic and comprehensive research, rather encompassing only those works readily available to researchers. The third type included in summarization category comprises descriptive reviews, which aims to determine to what extent

empirical studies in a specific research area support or reveal patterns or trends by collecting, coding, and analysing numerical data that reflect the frequency of topics, authors, or methods.

The second category presented by Paré (2015) deals with the aggregation and integration of empirical data generated by the research. The first type in this category - meta-analysis - uses statistical methods to aggregate quantitative data in the form of standard effect measures. The second type - qualitative systematic reviews - aims to research, identify, select, evaluate and abstract data from quantitative empirical studies to respond and analyse effects of a studied phenomenon. The third type - umbrella review - integrates evidence of multiple systematic reviews (qualitative or quantitative) into one document accessible and usable to answer a single research question.

The third category described by Paré et al. (2015) encompasses two forms of research synthesis aimed at explanation and building. The first is the theoretical review, which builds on existing concepts and empirical studies to provide a context for identifying, describing, and transforming various concepts, constructs, or relationships into one order or structure. Its main objective is to develop a conceptual framework or model with a set of research propositions or hypotheses. The second type of review in this category is the so-called realistic review. Reviews of this type are interpretive and are designed to inform or complement conventional systematic reviews, comprising heterogeneous evidence on complex interventions applied to diverse contexts to inform decision-making policies. They stemmed from criticism of conventional systematic reviews and meta-analysis of non-complex data.

The last category described by Paré et al. (2015) is the so-called critical review. This type of review aims to critically review literature on a broad topic in order to reveal weaknesses, contradictions, controversies, or inconsistencies.

Table 1- literature review types

Category	Theoretical review types	Search strategy	Nature of primary sources	Explicit study selection	Quality appraisal	Methods for synthesizing findings
Summarization of prior knowledge	Scoping review	Comprehensive	Conceptual and empirical	Yes	Not essential	Content or thematic analysis
	Narrative review	Usually selective	Conceptual and empirical	No	No	Narrative summary
	Descriptive review	Comprehensive	Empirical	Yes	No	Content or frequency analysis
Data aggregation or integration	Meta-analysis	Comprehensive	Empirical quantitative	Yes	Yes	Statistical methods
	Qualitative systematic review	Comprehensive	Empirical quantitative	Yes	Yes	Narrative synthesis
	<i>Umbrella review</i>	Comprehensive	Systematic reviews	Yes	Yes	Narrative synthesis
Explanation building	Theoretical review	Comprehensive	Conceptual and empirical	Yes	Yes	Content analysis or interpretative methods
	Realist reviews	Iterative and purposive	Conceptual and empirical	Yes	Yes	Mixed-methods approach
Critical assessment of extant literature	Critical review	Selective or representative	Conceptual and empirical	Yes or no	Not essential	Content analysis or critical interpretative methods

Source: Paré et al. (2015).

3. METHODOLOGICAL APPROACH

For this article, we chose the type of “scoping / mapping” literature review because the objective is to provide an initial panorama and indication of the size of the scientific production on a specific topic, which the scoping / mapping review allows to accomplish (PARÉ et al., 2015). Unlike other types of literature review, scoping / mapping prioritizes the scope of scientific output over depth.

The scoping / mapping review seeks to map relevant work on a given topic, answer broad questions and quickly identify the main concepts involved in the topic of study (ARKSEY; O’MALLEY, 2005). Other studies have already applied the scoping / mapping review type to map existing scientific production. For example, Viana (2013) applied this review type to find the most addressed aspects by the literature in the health area and to identify in which regions of the country there were highest production of topics of interest.

According to Paré et al. (2015), the scoping / mapping literature review has six characteristics. In table 2 we describe how we applied these characteristics.

Table 2 – Characteristics of scoping/mapping review in this study

Characteristics of Scoping/Mapping review (PARÉ et al., 2015)	Application in this study
Broad questions	Three broad questions were created in the introduction regarding the growth of scientific production on the topic, the definition of UPA, and main aspects of the interests of authors.
Broad search strategy	We used the search tools Google Scholar, Web of Science and Data base of Thesis CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nivel Superior), through which we identified 312 works. Theses and dissertations found along with the Google Scholar search were intended to indicate which were the most relevant actors making research on each subject. The CAPES database indicated which were the national authors and Google Scholar pointed to the most cited authors, thus indicating their importance.
Conceptual and empirical sources	We used academic articles, theses and dissertations.
Explicit selection	Of the 312 papers identified, approximately 37 were selected for discussion of the main points of the UPA.
Quality evaluation of articles	The quality evaluation was not carried out because it is not essential to scoping/mapping review according to Paré et al. (2015), given that the objective of this type of review is to provide a mapping of the existing literature and not to analyze the quality of studies.
Thematic analysis	Thematic analysis (FEREDAY and MUIR-COCHRANE, 2006) was used to identify the main categories after collecting the articles, theses and dissertations. The identification of the main discussed points was elaborated by applying inductive approach (BOYATZIS, 1998).

Source: adapted from Paré et al. (2015)

4. RESULTS AND DISCUSSION

4.1 SCOPING/MAPPING REVIEW APPLICATION

After defining the research questions described in the introduction of this study, the review was elaborated following the steps: (4.1.1) identification of relevant scientific studies on UPA; (4.1.2) Selection of studies for the application of the scoping/mapping review; (4.1.3) definition of the term Urban and Periurbana Agriculture; and (4.1.4) definition of themes highlighted in discussion.

4.1.1 Identification of relevant scientific studies on UPA

Three tools were applied for identifying scientific studies: Google Scholar, Web of Science and the CAPES Thesis Database. In Goggle Scholar a survey was conducted to identify the most relevant authors on the subject, taken as a reference for the definition of the term Urban and Periurban Agriculture. The research pointed to two authors: Luc J.A. Mougeot and Jac Smit, as the most relevant authors who worked in the definition of the term. On March 3, 2018, their main works had 628 and 600 citations respectively.

According to the Canadian Council for International Co-operation (CCIC), Luc J.A. Mougeot led, between 1993 and 2004, the “Urban Environment Management and its Cities Feeding People (CFP)” program at the International Development Research Center of Canada. His publications include the books *Agropolis: The Social, Environmental, and Political Dimensions of Urban Agriculture* (2005) and *Growing Better Cities: Urban Agriculture for Sustainable Development* (2006).

Mougeot also made a significant contribution to the definition of the term Urban and Periurban Agriculture in his article *Urban Agriculture: Definition, Presence, Potentials and Risks, and Policy Challenges* (2000). Although not configured as a scientific article published in academic journals, but a report from the International Development Research Center (IDRC) (November 2000 *Cities Feeding People Report Series 31*), the work appears in Google Scholar as the most cited work on Urban Agriculture. The search was performed on March 3 by the words “Urban Agriculture”, organized by relevance and the work appears with 628 citations.

Besides Mougeot, another author who stands out in academic productions on the subject is Jac Smit. According to his website, Jac Smit is the founder of The Urban Agriculture Network, Inc. (TUAN), created in 1992. In 1996, his book *Urban Agriculture: Food, Jobs and Sustainable Cities* was published by the United Nations Development Program (UNDP). In a research conducted on March 3, 2018, the book *Urban Agriculture: Food, Jobs and Sustainable Cities* appeared in Google Scholar with 600 citations, holding the second position, shortly after the publication of Mougeot (2000).

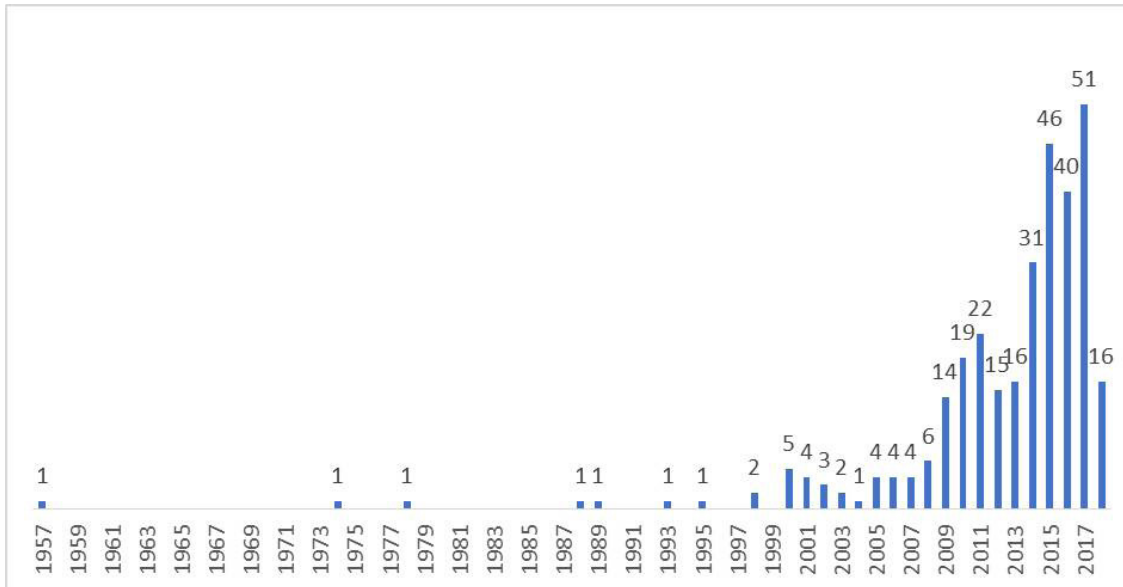
In the Web of Science search tool, an exhaustive search was carried out identifying all articles with the keyword “Urban Agriculture”, in titles and abstracts through the articles category. The search was performed on March 19, 2018, under the option “Web of Science Main Data Collection”. We identified 304 scientific articles in the search.

In the CAPES database, a survey was conducted on August 5, 2018. Six theses or dissertations were identified with the mention of “urban agriculture” keyword in their titles, with geographical focus on São Paulo City.

Therefore, adding the selected articles in the search conducted in Google Scholar, Web of Science and the CAPES database, we identified 312 works for this literature review.

In order to know when the first academic work on the subject was created and when the subject became the object of more intense academic research, a search was made without specifying a period. Thus, we found the oldest work dating from 1957, entitled “Urban agriculture in southern Japan”. Moreover, our research showed that the scientific production on the subject has increased significantly in the last ten years, as shown in Figure 1:

Figure 1 - Number of identified works - total 312 (* year 2018 to 19 March)



Source: The authors.

In the last three years (2015, 2016 and 2017) it was produced an average of 46 works per year, more than the double of the production in the previous three years (2012, 2013 and 2014) with an annual average of 21 works per year. Between 2009 and 2011 the annual average was 18 papers, almost four times above the triennium between 2006 and 2008, with an average of 5 articles per year.

4.1.2 Selection of works for the literature review

Among the identified 312 papers, 37 were selected for further study. This set of 37 papers was selected in order to provide references of papers that may guide future research, since providing an overview of the extant literature on the subject is the main objective of the Scoping / mapping literature review. This set consists of 2 works by the main authors on the subject (Mougeot and Smit), selected on Google Scholar; 6 theses and dissertations found on CAPES database; two articles from each of the 7 main categories of academic articles on UPA and, finally, 15 articles allocated in the quantitative potential category, as these texts include other factors that interfere with potential of urban agriculture. It is worth noting that there is no deepening on the topics discussed, as this is not the objective of the scoping / mapping review type.

The works of Mougeot (2000) and Smit et al. (2001) were selected because they are considered references in the definition of the AUP term, one of the questions to be answered in this literature review.

The six theses/dissertations dealing with UAP in São Paulo, identified in the CAPES database were included (Table 3) to provide a relevant basis for national production as São Paulo presents high productive as already mentioned in the introduction section.

Table 3 – Dissertations and Thesis from CAPES database, dealing with UPA

Author	Title	Year
Rostichelli, Michele	Between Land and Asphalt: the Metropolitan Region of São Paulo in the context of urban agriculture	2013
Valdiones, Ana Paula Gouveia	Panorama of urban and peri-urban agriculture in São Paulo	2013
Nakamura, Angelica Campos	COOPERAPAS: agriculture and cooperativism in the far southern region of the municipality of São Paulo	2017
Nagib, Gustavo	Urban agriculture as activism in Sao Paulo city: the case of Corujas Community Garden.	2016
Oliveira, Lya Cynthia Porto de	Networks, insights and public action in the urban agriculture: São Paulo, Montreal e Toronto	2017
Machini, Mariana Luiza Fiocco	Within concrete cracks: politics and movement at community gardens in São Paulo '	2017

Source: the authors.

The remaining 304 papers, found during research on Web of Science, were divided into categories. After a first reading of these articles titles, we identified the most recurrent themes of UPA approached by them. Reading the abstracts we grouped these aspects in themes, which allowed us to form seven categories: concept and panorama; urban planning and governance; social impacts; productive potential; environment; risk of contamination; and productivity techniques. The purpose of themes aggregation was to emphasize the primary interest of the authors of researched and selected articles.

After this stage, we selected and read the two texts with the highest number of citations in each of the seven categories. The goal was to read articles from different categories, with different approaches, promoting a multidimensional understanding of the Urban Agriculture theme (Table 4). The selection of two articles from each category was due to research feasibility reasons.

Table 4 - Categories of the main aspects of UPA with the highest number of citations

Category	Description	Author	Nº of citations
Category 1: Concept and panorama (118 articles)	These are articles that deal with Urban Agriculture in general, without a specific focus. Most of them are articles that focus on the concept and definition of AUP and are accompanied by the panorama of AUP in a city, country or region. Others focus on trend and challenge analysis.	ZEZZA e TASCIOTTI (2010)	133
		Agrawal et al. (2003)	104
Category 2: Urban planning and governance (30 articles)	These articles focus on the insertion of UPA in urban planning policies (eg. zoning laws), public policies and governance.	Mendes et al. (2008)	45
		Lynch et al. (2001)	40
Category 3: Social impacts (48 articles)	These are articles that focus on UPA as a tool for reducing social vulnerability. Most of them deal with evidence of nutritional indicators increasing, food security and benefits of relationship between people and community empowerment. They also focus on female empowerment, highlighting women as an important agent for UPA performance.	Zeza e Ttasciotti (2010)	133
		Brown e Jameton (2000)	86
Category 4: Productivity potential (17 articles)	These articles bring the discussion to a more practical and quantitative field and seek to answer to what extent this phenomenon (UPA) can be significant for food production. Most seek to apply a productivity factor to the amount of available area in a given city, considering empty areas and building roofs. Finally, the value is compared to the city's demand for fruits and vegetables.	Thapa e Murayama (2008)	72
		Taylor e Lovell (2012)	69
Category 5: Environment (26 articles)	Although sustainability is mentioned in the vast majority of articles, these articles focus specifically on life cycle analysis, energy expenditure and biodiversity generation.	Kulak et al. (2012)	42
		Lin et al (2015)	38
Category 6: Resources contamination (22 articles)	These articles focus on AUP's main challenge, urban food contamination. The articles deal with contaminated soil, traces of heavy metals in food, transmission of diseases via irrigation. Contamination stands out as one of the main challenges and in some cases a factor that makes impossible the growth of AUP.	Agrawal et al. (2003)	104
		Afrane et al. (2004)	65
Category 7: Productivity techniques (43 articles)	They are articles that focus on specific techniques, such as water reuse, residential sewage reuse or composting for UPA. They are relevant for analyzing interrelationship between urban resources and UPA.	Agrawal et al. (2003)	104
		Afrane et al. (2004)	65

Source: The authors¹

1 Note: In the categorization of the main aspects addressed by the authors, some articles were repeated, as they focused on more than one theme of interest to these authors. Therefore, in column 1, the total sum of the articles presented is greater than 304, the number of articles found in the Web of Science.

Finally, the remaining 15 articles were selected in the “Category 4: Quantitative Potential” (Table 5), which objective is to provide ways for inference of urban agriculture productive potential in certain cities. These texts are especially interesting because, in an attempt to calculate the potential of urban and periurban agriculture in a city, the authors deal with factors that interfere with the growth of it.

Table 5 – Studies from category 4: Quantitative potential

Articles	Nº. of citations	Articles	Nº. of citations
Colasanti et al. (2012)	43	Oka et al.(2014)	3
Orsini et al. (2014)	37	Pulighe e Lupia (2016)	2
Martellozzo et al. (2014)	21	Napawan e Burke (2016)	2
Mawois et al. (2011)	14	Roth et al., 2015	2
Haberman et al. (2014)	7	Martin-Guay et al. (2018)	1
Mallawaarachchi e Foster (2009)	6	Saha e Eckelman (2017)	1
Ward (2014)	5	Parece e Campbell (2017)	1
Total 15 articles			

Source: the authors

Note: The complete references of these articles can be found at References section.

4.1.3 Definition of the term Urban and Periurban Agriculture

The term Urban Agriculture has been increasingly adopted, not only by academics, but also by international agencies and governments. Therefore, it is worth defining the term. The definition of the term, besides helping to categorizing this new phenomenon, enable the differentiation between “agriculture practiced in the urban area” and “urban agriculture”, besides differentiating urban agriculture from other related themes such as rural agriculture, sustainable urban development, and urban food system (MOUGEOT, 2000).

Some themes are often present in the authors’ attempts to describe the phenomenon, preventing it from being confused with its variants. They are: types of economic activities, categories and subcategories of food and non-food products, urban and periurban location, types of areas where UPA is practiced, destination of products and scale of production (Table 6).

Table 6 – Key themes in the definition of AUP

Analysed themes	Description
Types of economic activities	In the case of urban agriculture, production, processing and marketing phases tend to be more interrelated than in other types of agricultural activities. Small urban units perform activities in vertical ways, which directly affect the final consumer. In the case of urban agriculture, the economy of agglomeration is more important than the economy of scale (a major factor in rural agriculture).
Food and non-food product categories and subcategories	Urban agriculture activity refers to the cultivated product. Categories such as vegetables, horticulture and fruits are more common than industrial crops like tobacco and soy, for example.
Location	The most frequently analyzed aspect in the urban agriculture theme is its location. Most of the studies were done in large cities, and all agriculture practiced there are intra-urban or peri-urban, therefore it is not necessary to differentiate it from any rural agriculture practiced in the region. Few have made the effort to differentiate between urban and peri-urban. Those who tried it used the following criteria: population density ranges, legal definitions or competition for resources for other purposes.
Types of area where activity is practiced	Studies focused on this element differentiates residential areas, open areas, type of land assignment (rent, lease, own area, public area, etc).
Products destination	Most of the studies have identified production destinations for own consumption and/or commercial ends. These studies show that most farmers produce for both, varying in intensity.
Production scale	Most of the studies focus on family productive structures and micro productions.

Source: Mougeot (2000)

After the systematization of the main elements from urban agriculture studies, Mougeot (2000) made important contributions to the concept development. One of Mougeot’s main contributions to defining the concept was to draw attention to its connection to urban dynamics, an essential feature of Urban Agriculture. As outlined below, it is the interaction with the city that makes agriculture defined as urban, not just its location:

The lead feature of UA which distinguishes it from RA (sic Rural Agriculture) is its integration into the urban economic and ecological system (from hereon referred to as “eco-system”). It is not its urban location which distinguishes UA(sic Urban Agriculture) from RA but the fact that it is embedded in AND interacting with the urban eco-system (MOUGEOT, 2000, p 10).

Therefore, a revised concept of urban agriculture is forged, focusing not only on its location, but on the exchange of resources between urban agriculture and the city:

UA is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area (MOUGEOT, 2000, p. 11).

As Mougeot (200), Smit et al. (2001) adopt a definition, which goes beyond location, highlighting the link between urban agriculture and city dynamics. Smit et al describe urban agriculture by the use of urban resources, reuse of natural resources and urban wastes and by the provision of food for the city contributing to the food security, health, livelihood, and environment of the individual, household, and community:

...an industry that produces, processes, and markets food, fuel, and other outputs, largely in response to the daily demand of consumers within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban and peri-urban areas. Typically urban agriculture applies intensive production methods, frequently using and reusing natural resources and urban wastes, to yield a diverse array of land-, water-, and air-based fauna and flora, contributing to the food security, health, livelihood, and environment of the individual, household, and community (SMIT et al., 2001, p 1).

Both authors (Mougeot and Smit) made relevant contributions to the definition of Urban Agriculture concept, arguing that what defines Urban and Periurbana Agriculture is its interconnection with the dynamics of a city where it is practiced, rather than its location. Urban and Periurbana Agriculture takes place in the city, using resources from that city and producing food for that city, and their relationship is a key feature (SMIT et al, 2001; MOUGEOT, 2000) for defining the concept.

4.1.4 Discussion on selected studies

The discussion in this section is developed based on themes, identified during the work of analysis of the 312 studies presented in the previous sections. The collected material was categorized by applying thematic analysis method. Thematic analysis helps in the interpretation of results (Fereday & Muir-Cochrane, 2006). For categorization, the inductive thematic approach was adopted, which is based on categorization emerged from collected data. In this case, themes are not raised a priori and any interpretation is a posteriori (BOYATZIS, 1998).

The first identified theme was the dynamics of cities posing serious challenges to the food production, processing, distribution and consumption system (SPECHT et al., 2014). In this context, Urban and Periurban Agriculture has moved in recent years to the center of the urban sustainability discourse (SPECHT et al., 2014). AUP is the agriculture practiced in the city and for the city. More than its location, its main feature is its connection with the dynamics of the city in which it is inserted (SMIT et al., 2001 and MOUGEOT, 2000).

Another relevant identified theme is regarding to benefits brought about by the practice of AUP in a city. As these benefits, McClintock et al. (2013) highlight: food security and justice, public health, environmental sustainability, job creation, education and community strengthening. Zezza and Tasciotti (2010) (2010) found consistent evidence positively linking UPA practice with improved nutritional indicators. McClintock et al. (2013) highlight the potential of AUP to integrate urban dwellers and reconnect them to the production of the food they consume. Kulak

et al. (2012) highlights the potential for reducing CO₂ emissions in UPA practice compared to conventional agriculture. Brown and Jameton (2000) delve into the benefits related to quality of life and well-being, mentioning the increase in physical exercise, relaxation and stress reduction. Mendes et al. (2008), focus on urban planning issues, cites AUP's ability to create vibrant green environments, revitalization of abandoned areas, improvement of air quality, reduction of travel distance from food to consumer, cooling of buildings, and increase of urban biodiversity. To the aforementioned benefits, Saha and Eckelman (2017) add water production and flood reduction, noise pollution reduction and heat island effect mitigation.

Sustainability is another explored theme by some authors who study UPA. As pointed out by Specht et al. (2014), UPA's view as a sustainable practice is often "common sense" without scientific basis or in-depth analysis. According to the author, one example is the assumption made by many authors that UPA practice implies a reduction in CO₂ emissions, for logical reasons related to the reduction of food transport distances. However, most of the times, this assumption is made without a complete and accurate quantification analysis. Still according to Specht et al. (2014), activists tend to claim, without scientific proof, that local production is always more sustainable than large-scale production. The author calls this bias a "local trap" and states that this bias can often be observed regarding to UPA.

Concerning the theme of challenges and limitations to UPA growth, three challenges stood out in the literature review. The first is the impact of urban contamination on UPA, as it is speculated that contaminants present in urban soil, water or air may be transferred to consumers through UPA (HABERMAN et al., 2014). According to Agrawal et al. (2003), urban air pollutants may also negatively affect UPA productivity. According to Afrane et al. (2004), the UPA creates favourable environments for the development of disease-carrying mosquitoes, as evidenced by its study of Malaria transmission in Ghana. The second and third are limitations intrinsically related. They are: the availability of space in the city and the financial viability of UPA. Martellozzo et al. (2014) highlight the fact that, despite the growing debate about UPA and its benefits, no study has proposed to calculate how much food could actually be produced in cities, considering productivity indicators and space requirements. Lack of space in cities and competition for other uses calls into question UPA true ability to produce a significant amount of food. Competition for land increases its value, making UPA, in many cases, financially unfeasible. For example, Mendes et al. (2008) discuss competition for other urban land uses that provide higher financial return. Specht et al. (2014) provide an example, discussing competition for UPA on buildings areas, usually financially overvalued.

Another theme refers to the consensus that, despite of the growing interest in UPA, data are lacking for its analysis and quantitative studies are scarce (ZEZZA; TASCIOTTI, 2010)). According to Martellozzo et al. (2014), there is a lack of studies on the real potential of UPA to provide the amount of fruits and vegetables consumed in the city, considering their spatial limitations. Haberman et al. (2014) points out that even in Montreal, recognized for its "green city" character, the lack of data on UPA is surprising.

The lack of data and difficulty in defining and quantifying UPA point to another characteristic of this practice: its heterogeneity. The multiple faces and contradictions of UPA can be found in the most diverse angles of its analysis, interpretation of its meanings (MCCLINTOCK et al., 2013), in places where it is practiced (SAHA and ECKELMAN, 2017), adopted forms of governance (MCCLINTOCK et al., 2013) and employed techniques (HABERMAN et al., 2014). Oliveira (2017), analyzing cases from São Paulo, Montreal and Toronto, showed that, although UPA has departed from different ideas and actions in each municipality, it tends towards homogeneity, mobilizing networked actions in different sectors: community, social, economic and state.

UPA is treated as a radical movement that opposes to the dominant industrial agricultural system, but also fits in with neoliberal ideology (McClintock et al., 2013). An interpretation of UPA as a subversive, progressive and radical practice is common in the literature, highlighting its social and environmental benefits and its ability, such as Alternative Food Networks (AFN), to return social relationships to an agro industrial system reproaching producers and consumers (McClintock et al., 2013).

Some of the thesis and dissertation previously analyzed in this study reinforce this interpretation. Valdiones (2013), for example, reports that UPA initiatives that are in peripheral areas of the city of São Paulo have great potential to perform social and environmental as well as productive functions. Therefore, it would be necessary that public policies were expanded to these areas, strengthening the UPA held in the municipality. Nakamura (2017) and Fiocco (2017) explore the ways in which groups of people deal autonomously with social and environmental issues that could be the focus of state action. Rostichelli (2013) reinforces this approach, emphasizing that UPA can become the place where solidarity and community ties are clustered. For Nagib (2016), this community and solidarity UPA experience is as a form of appropriation of public space.

In an opposite interpretation, some literature considers AUP as neoliberal, since it places on the shoulders of individuals and communities the obligation to supply the holes left by the the state, under a discourse of stimulus to entrepreneurship and self-realization (MCCLINTOCK et al., 2013).

In addition to its political interpretation, UPA is also heterogeneous in its techniques. UPA can be implemented in different ways by people with different levels of knowledge and with a wide range of techniques (Haberman et al., 2014).

UPA is also heterogeneous from the point of view of governance, being organized by institutions such as schools, prisons and hospitals, or by families in their gardens, in vacant lands by government incentive (MCCLINTOCK et al., 2013) or by entrepreneurs (MENGUAL, 2015).

UPA is also diverse and heterogeneous as regards the place where it is practiced. In their efforts to calculate the productive potential of Montreal and Boston, Saha and Eckelman (2017) and Haberman et al. (2014) list several places where UPA is practiced, including ground-level sites such as gardens and land, and innovative sites such as building roofs.

5. FINAL CONSIDERATIONS

The main contribution of this study is not only to reveal that the great interest in the subject developed since the 2000s and that has been evolving significantly in recent years, but also in the presentation of the main themes dealt with in the academic literature. Future researches may further analyze the themes revealed in this study, discussing their implications for populations and cities.

The first discussion that could be deepened concerns the definition of UPA, not only in relation to the location of urban agriculture practice, but also considering urban dynamics as a parameter. As identified earlier, UPA is also defined by its relationships with cities.

Another discussion with great potential to be explored in future studies is related to quantitative potential of the areas available for urban agriculture. Based on identification of available areas, public policies could be designed for their better use, regarding the various purposes of the UPA. Moreover, there is also great potential for studies that address urban planning and governance related to best definition of areas that can be used without risk of contamination for populations that exploit them.

The social impacts of this research include the identification of UPA as a relevant theme in several countries around the world regarding food safety, improvement of health indicators and reduction of pollutant emissions. The literature review reveals that public policies that include agriculture on their agenda could contribute to social and environmental improvements.

The study limitations include the fact that from the 304 articles found in the Web of Science search, we considered only 29 (a sum of 2 articles from each of the seven categories of the most cited articles [14] plus 15 articles in the quantitative potential category) Other studies may consider the possibility of employing statistical techniques to select different numbers of articles for categories formed from the topics of authors' interests, as each of those categories concentrates a distinct number of articles. Another limitation is the concentration of focus on dissertation and thesis from São Paulo city. A broader focus could be adopted in future studies.

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Contribution	[Author 1]	[Author 2]
1. Definition of research problem	√	√
2. Development of hypotheses or research questions (empirical studies)	√	√
3. Development of theoretical propositions (theoretical work)	√	√
4. Theoretical foundation / Literature review	√	√
5. Definition of methodological procedures	√	√
6. Data collection	√	
7. Statistical analysis		
8. Analysis and interpretation of data	√	
9. Critical revision of the manuscript		√
10. Manuscript writing	√	
11. Other (please specify)		