



Urban agriculture: How bottom-up initiatives are impacting space and policies in São Paulo

ELIANE HORSCHUTZ NEMOTO*¹ & ANDRÉ RUOPPOLO BIAZOTI *²

¹ Department of History, Geography and Antiquity Sciences (DissGea), Università Degli Studi di Padova, Italy

² Environmental Education and Policy Laboratory (OCA), University of São Paulo (USP), Brazil

* Corresponding author: eliane_hn@hotmail.com & andrebiazoti@gmail.com | +33 660742566

Data of the article

First received : 18 August 2017 | Last revision received : 27 November 2017

Accepted : 1 December 2017 | Published online : 29 December 2017

URN: nbn:de:hebis:34-2017110153670

Keywords

urban agriculture, social innovation, social capital, bottom-up initiatives

Abstract

The growing demand for the creation of urban gardens in large cities has created a discussion about the need for green spaces in cities that fulfil multiple functions. Beyond the production of fresh and healthy food, these spaces should also connect citizens, transform the public space through collective action, and engage the participation of society in the policies and planning for a greener city with a better quality of life. This paper addresses the case of São Paulo specifically, and illustrates how urban gardens have been boosted in the city through a dynamic process mainly driven by bottom-up initiatives arising at the local scale. These initiatives have been able to advance strategies and policies, including those regarding urban agriculture, in the Municipality's agenda. The paper also discusses how these urban gardens have created and reinforced social innovation and social capital among the actors, with the common objective of building a more sustainable and democratic city.

Introduction

Considering the estimates that more than two-thirds of the global population will be living in cities by 2050, the rapid rate of urban growth will increasingly create enormous challenges (World Health Organization (WHO), 2010). While cities concentrate opportunities, jobs and services, on the other hand, the challenge of planning and implementing urban policies aiming to maintain the well-being and quality of life of citizens in an inclusive way has become more complex. In this context, green urban areas play an important role in health, leisure, landscape aesthetics, and social interaction and as a refuge from noise and the daily rush in cities. According to the WHO (2010), a minimum of 9 m² of green space per inhabitant is recommended. In a similar perspective, the Food and Agriculture Organization (FAO) of the United Nations recognizes the challenges of feeding a growing urban population and adapting agriculture to climate change scenarios. According to the FAO, sustainable crop production with strong rural-urban linkages will

need to thrive, putting urban agriculture at the center of the issue. Urban and peri-urban horticulture have become essential strategies to overcome malnutrition and build more sustainable and resilient cities (FAO, 2010).

The aim of this paper is to discuss and analyze the role of urban gardens in São Paulo as green spaces which contribute to the production and consumption of fresh food, environmental awareness, and building proximity and social cohesion in communities. Additionally, this paper will discuss how urban gardens have become a main driver for bottom-up initiatives to re-appropriate the city space, address actions demanding a better quality of life and negotiate rights for citizens at the local and municipal scales. To this end, the concepts of urban agriculture and its multifunctionality, social innovation and social capital are presented in order to analyze the positive impacts and the advances of the recent phenomenon of increasing and spreading urban gardens in

Citation (APA):

Nemoto, E. H., & Biazoti, A. R. (2017). Urban agriculture: How bottom-up initiatives are impacting space and policies in São Paulo. *Future of Food: Journal on Food, Agriculture and Society*, 5(3), 21-34.



São Paulo (Brazil). In addition, in order to describe the current context of the study case, secondary data will be presented based on official documents, laws and policies defining urban agriculture in the city, academic studies, as well as the participatory observation during urban gardening activities.

Literature Review

Urban Agriculture

Historically, urban agriculture emerged from different context and needs. The main drivers in the past decades was alimentary needs, given the accelerated process of urbanization in developing countries and the increasing demand for food in the cities. Another driver concerns the political and economic crises. For example, during the Second World War, urban agriculture played a strategic role in providing food in cities like Berlin and Vienna as well as in British towns. The USA and Canada also promoted urban agriculture as a defensive strategy. In a recent article, researchers from University of California-Berkley and Stanford found that urban agriculture, defined as agriculture present in urban areas or within twenty kilometers from the city center, globally comprises an area equivalent to the European Union, totaling 456 million hectares worldwide (Drechsel, Thebo & Lambin, 2014).

The debate over conceptualization has been striving to build internal cohesion, based on urban agriculture practices in the territories, and an external functionality that relates it to other types of agriculture (Mougeout, 2000). The conceptual structure considers different dimensions, such as the types of economic activities performed as well as the categories and subcategories of food and non-food products produced. It also takes into account the characteristics of the urban or peri-urban location of the activity, the types of areas where agricultural production is located, the types of systems of production, production allocation, and production scale (Mougeout, 2000). What defines urban agriculture, according to Mougeout and other authors who analyze the theme and its history, is its integration with the urban economic and ecological system (Mougeout, 2000). In addition to the clear nature of food supply, urban agriculture has also been linked to benefits in the public health sphere (Costa, 2015), territorial planning (Barbizan, 2011), urban space production (Almeida, 2016), cities' sustainability and food systems (Deelstra & Girardet, 2000), and gender equality (Mougeout, 2006). Community gardens also have activist and countercultural characteristics, by counteracting the capitalist mode of production of the city with the perspective of a city built by and for the people (Nagib, 2016). Furthermore, the FAO

presented the concept of the Multifunctional Character of Agriculture and Land (MFCAL) in 1999, which encompasses the entire range of environmental, economic and social functions associated with agriculture and related land-use, recognizing that agricultural systems have fulfilled more than just their primary aim of producing food, fiber and fuel. Moreover, an in-depth approach presented by Baycan-Levent et al. (2009) regarding the urban agriculture and greenspaces discussion addresses the taxonomic approach to define a variety of urban green-space values, classified according to five categories: (i) the ecological values as intrinsic natural value, genetic diversity value, and life-support value; (ii) the economic values as market value; (iii) the social values exemplified by recreational value, aesthetic value, cultural symbolization value, historical value, character-building value, therapeutic value, social interaction value, and substitution value; (iv) the planning value: instrumental/structural value, synergetic and competitive value; and (v) the multidimensional values as scientific and policy value.

Another feature to be emphasized in this paper refers to urban agriculture multifunctionality and its strong attachment with the territory, describing a new kind of locally-embedded model of agriculture representing a different farming system that is more territorially embedded. This system makes use of local resources, taking into account the local specificities and trying to build a new relation among community insiders as well as outsiders, acting to reach common interests (Wilson, 2001; Renting et al., 2003; van der Ploeg & Roep, 2003; Huylenbroeck et al., 2007). In addition, urban agriculture has been increasingly considered in the strategies and policies of cities in order to create urban resilience, since local food production in urban and peri-urban areas can contribute to reduced dependence on the global food system, which is considered to be vulnerable to disturbances (Olsson et al., 2016).

In this paper, we will consider the urban agriculture categories suggested by McClintock (2014): residential, allotment, guerrilla, collective, institutional, non-profit and commercial/for-profit. These categories will help to create a better understanding of the diversity of São Paulo's urban agriculture and frame our research objective clearly. Regarding urban agriculture implementation in different contexts, diverse cities of industrialized and developing countries have shown increasing interest in urban agriculture, which has resulted in a growth in the number and diversity of urban collective gardens involved in some form of gardening, including bottom-up and top-down approaches and initiatives (Evers & Hodgson, 2011; McClintock, 2010; Taylor & Lovell, 2012; Pouriás et al., 2016). For instance, Paris, Montreal, New York



City (NYC), Toronto and São Paulo are reference cities where collective gardens are proliferating and waiting lists to join a garden are growing longer. Consequently, the municipalities are being pushed to advance and adopt official programs to regulate and promote the integration of gardens into the cities' spatial planning (Demailly, 2014; Gittleman et al., 2012; Ohmer et al. 2009; Saint-Hilaire-Gravel, 2013; Pourias et al., 2016; Oliveira, 2017).

On the one hand, some of the main challenges to developing urban agriculture in large urban centers are related to the high price of land, high taxes and the competition between urban gardens and other "best use of land," such as commercial or residential use. On the other hand, while land is a critical element, people and community are key to solving the problems with land (Angotti, 2015). The case of NYC emerges as a reference of a densely developed city where urban agriculture has spread through community gardens, school gardens, commercial green roofs and small farms, currently totaling around 700 community gardens, despite the main constraint of the high cost of land (Angotti, 2015). Moreover, urban agriculture has been considered a strategy to mitigate public health and environmental problems in NYC, since the city suffers from higher than average rates of obesity and diabetes, and additionally, since the diet-related diseases and inadequate access to healthy foods are more frequent in areas where the city has vacant land (Ackerman, 2011). Therefore, urban agriculture has been seen as a strategy to tackle these issues by offering access to fresh and healthy food, promoting positive behavioral changes in food habits in the long term, as well as potentially reducing disparities between neighborhoods (Ackerman, 2011).

Turning to the case of Europe, Paris is an example of densely-populated city where the number of community gardens (*jardins partagés*) have increased since 2002. The types of gardens can be distinguished as *jardins familiaux*, gardens in which families have their own plots, of which there were 2 in Paris *intra-muros* in 2013, and *jardins partagés*, gardens shared by citizens living in the vicinity, accounting for 122 gardens in inner Paris in 2013 (Pourias et al., 2016). In 2013, a municipal program called *Main Verte* was adopted to manage and promote urban gardening through the *jardins partagés*, with the aim of encouraging social interactions in the neighborhoods (Pourias et al., 2016).

Furthermore, an interesting and different case compared to NYC and Paris is Detroit, an example of a shrinking city. Detroit had a boom in population and significant growth as the capital of the automobile industry in the begin-

ning and middle of the 20th century. Later in the post-industrial context, the city lost its economic attractiveness and has suffered a population decline. In this context, urban agriculture has arisen as an alternative for an ageing industrial cities in order to address main topics such as converting vacant areas into productive land, providing access to fresh and healthy food, employing people, and promoting the revitalization of the city through local food production and trade, which strengthens sustainable practices and social cohesion (Draus, Roddy, & McDuffie, 2014).

Social innovation and territory

The term social innovation has been used since 1960, originally in the US and Europe, and it has received a growing interest, including varying interpretations and fields of application (Moulaert & Mehmood, 2017). Thus, to guide the paper's discussion, some of the main reference concepts in social innovation are presented. In 1982, Chambon, David and Devevey investigated "the relationship between social innovation and the pressures bound up within societal changes" and demonstrated "how the mechanisms of crisis and recovery, both provoke and accelerate social innovation" (Moulaert, 2009, p. 13). Furthermore, Chambon et al. connected social innovation with social needs:

Socially innovative [...] practices are more or less directly aimed at allowing an individual – or a group of individuals – to deal with a social need – or a set of needs – that could not be satisfied from other means. (Chambon et al., 1982, p.8).

According to Moulaert (2009), social innovation tackles the "satisfaction of specific needs thanks to collective initiative, which is not synonymous with state intervention" occurring in different communities and spatial scales, but characterized by "processes of consciousness raising, mobilization and learning" (p.13).

Social innovation in contemporary social science has been applied in four spheres: management science, arts and creativity, territorial development, and political science and public administration (Moulaert, 2009). In this paper, the focus is given to social innovation and the territorial development, considering the spatial context, the spatial relations, and the transformation in the governance systems, including the establishment of new governance structures and organizations. Such changes are coupled with local and regional specificities and they are "negotiated between agents and institutions that have a strong territorial affiliation" (Moulaert, 2009, p.12). Moreover, thinking about social innovation as a way to foster social cohesion in an inherently territorialized and local process (Van Dyck & Van den Broeck, 2013) led us to the concept of Integrated Area Development (IAD).



IAD is based on two pillars: the “territorially based needs satisfaction” and “the innovation in social relations and socio-political empowerment”(Moulaert, 2009, p.18). Therefore, the combination of these two elements stresses the importance of creating ‘bottom-up’ institutions for participation and decision-making, “based on the empowerment of citizens deprived of essential material goods and services, and of social and political rights” (Moulaert, 2009, p.18). Along these lines, Van Dyck and Van den Broeck (2013) suggest:

[...] different actors should grasp their relations within their space in order to improve the uses of space. Further, different groups, actors and agents with area based development agendas have to interactively learn how to build in the spatial dimensions. (p.137).

Social Capital

The concept of social capital has been used by many authors in recent years, although it has its roots in Hannifan’s work on rural school community centers (Hannifan, 1916; 1920). This work addresses the capacity for action of social actors (understood here as non-state actors), strengthened by relationships of trust and reciprocity. The networks of relationships between individuals and with organizations can facilitate action towards achieving mutual benefit, including education, coordination and cooperation of actors. Different authors have focused on particular issues regarding these networks. For example, Bourdieu developed the concept of ‘weak ties’ in everyday practices. The associations (in a broader sense, including aspects of trust and reciprocity in informal contexts) between people can sustain a particular social advantage or disadvantage (Bourdieu, 1986). Many authors also sustained that the concept was underpinned by economic development, in which a community with high social capital would more easily thrive economically. It’s by this close relation to economic development that the concept reached important institutional discourse, such as at the World Bank (The World Bank, 2010).

The concept of social capital brings the notion that ‘relationships matter’ (Field, 2003) and that they work as a ‘social glue’ (Putnam, 2000). Community building, personal commitment and the development of a social fabric are features that are enhanced with high social capital. Trust is the basic element for the constitution of social capital. It is in face-to-face encounters that trust is built (Beem, 1999; Giddens, 1990) and social cohesion is further enhanced. This can have indubitable benefits for a community, but can also play a role for exclusion and subordination of a particular group by powerful elites. Social capital, therefore, could be described as a social structure that facilitates the actions of the individuals within the structure (Coleman, 1994). Bourdieu (1986) analyzed social capital from a Marxist perspective, attesting it to

be an attribute of elites, in which particular networks hold themselves in power, reinforcing unequal access to resources and class formation. This account is important to avoid the naïve assumption of social networks as always empowering a community.

Participatory spaces, i.e. spaces for social networking and development of political allegiances (Cornwall & Coelho, 2007), can reinforce inequalities of modern societies, such as power and gender distinctions (Hildyard et al., 2001). But other authors have focused on a more non-elitist account of social capital, in which marginalized communities and workers could benefit from it in their struggle for inclusion (Coleman, 1988). Putnam, one of the main authors in the field, then brought a different account into the discussion (drawing on Coleman’s perspective), focusing on the significance of association and civic community for the development of a more democratic society. For him, the concept was essential for the enhancement of the quality of life, as an individual in connection with others is able to test the veracity of her/his views, build trust, and cooperate to resolve collective problems. This perspective is even more important when considering environmental issues, once, as Macnaghten and Urry (1998) argue, there is no single concept of ‘nature’, but multiple contested concepts, which are constantly being reconstructed by social interaction. Therefore, social capital is important for the construction of a shared concept of (and identity with) nature within a community.

Another important discussion regarding social capital relates it to the functioning of a democratic society, emphasizing the importance of trust relations between networks and between representative organizations or stakeholder groups and the people they represent (Evans et al., 2005). The nature and level of social capital influence both expectations of a ‘good government’ (i.e. demand of civil engagement) and the social infrastructure in which a representative government acts (i.e. supply of civil engagement). It does so in the same way that social capital is influenced by encouragement of local institutions through, mainly, capacity-building processes (Evans et al., 2005). Social capital needs to exist in decision-making processes so that stakeholders can feel included and can impact the outcomes of the process. In this research, social capital will be analyzed from the perspective of building trust among citizens in their encounters in the garden and the political action that arises from the consciousness of the common territorial struggle to produce food in the neighborhoods.

Methodology

The literature review provided broad definitions of key

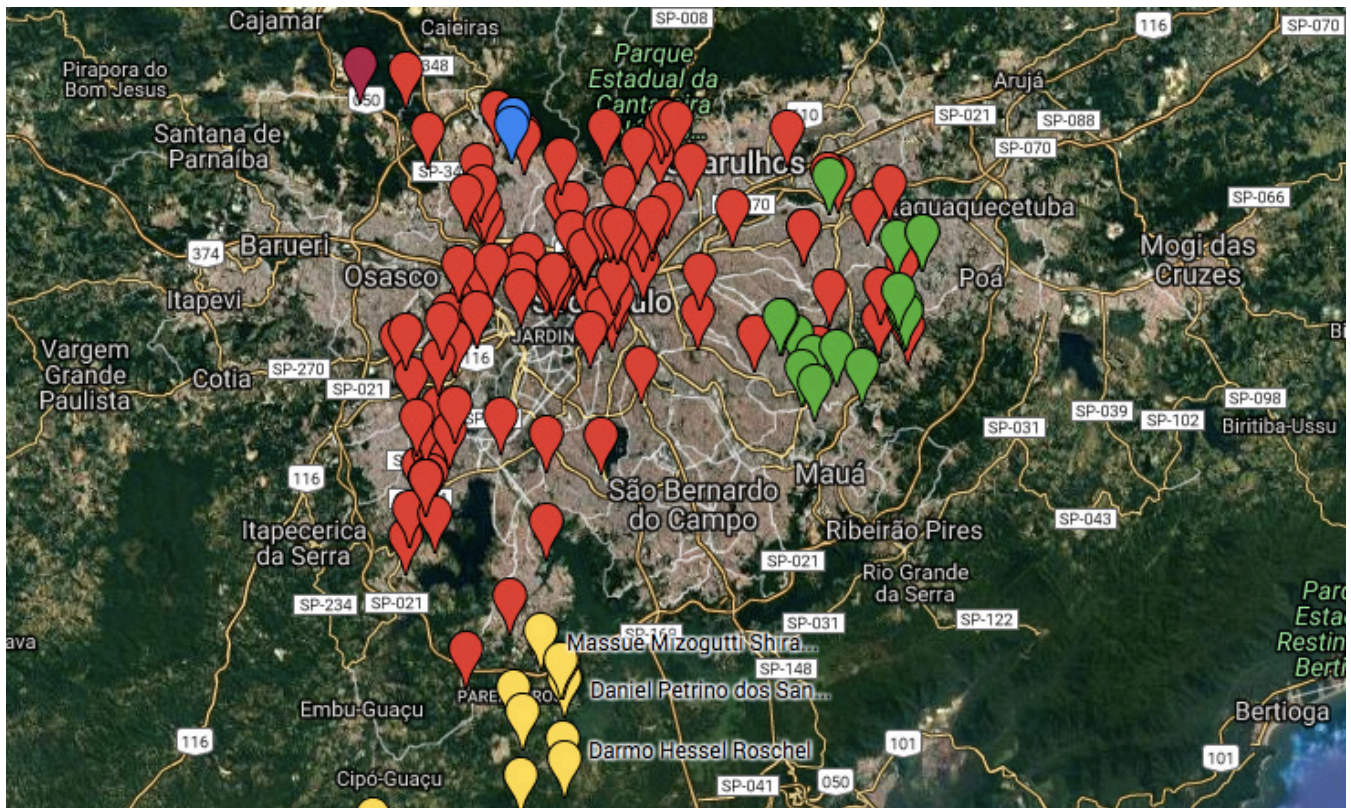


Figure 1: Agricultural activities in São Paulo, Brazil

In red, the community gardens; in yellow, the farmers from COOPERAPAS (farmer's cooperative association); in green, the farmers from the East Zone Farmer's Association (Associação de Agricultores da Zona Leste -AAZL); in purple the Landless Movement Camp Irmã Alberta (Acampamento Comuna da Terra Irmã Alberta - MST); and in blue the pork producers from APAFA association. The research focus on the community gardens, in red.

Source: Map is adapted from *openstreetmap.org*; author's own depiction.

concepts addressing urban agriculture and its multifunctionality, social innovation and social capital. Subsequently, these concepts will be applied to the case study of the city of São Paulo (**Figure 1**). In order to present the current context of São Paulo, the research was based on official documents from the municipality of São Paulo, as well as the laws and policies defining urban agriculture in the city. Furthermore, academic studies and social media web pages were also considered in order to grasp the organization and impact of the urban agriculture initiatives. In addition, participatory observation during urban gardening activities was conducted in order to understand the motivations and practices of some of the urban dwellers of the city's gardens. This methodology is important for ethnographic study and allows incursion into the field of action of urban farmers for the collection of data not often described or presented during interviews and documental analysis, but which are experienced in practice by the research objects. In the next section, we connect how the emergence of the urban agriculture in the city is related to social innovation as a locally-embedded process, linked to strong bottom-up

initiatives and citizen empowerment.

Case Study

São Paulo case study: Urban gardens and grassroots initiatives towards a city for citizens

Current context

The city of São Paulo, founded in 1554, is located in Southeast Brazil, with an estimated population of 12,038,175 and an area of 1,521 km² (Instituto Brasileiro de Geografia e Estatística, 2015; 2016). São Paulo is one of the most industrialized and the largest city in South America, representing the most important economic hub in Brazil, accounting for 17% of total GDP in 2016 (Euromonitor International, 2017). Regarding the urbanization rate of the municipality, between the years of 2000 and 2010, it increased from 94.05% to 99.10% (Atlas do Desenvolvimento Humano, 2017).

Concerning the green areas in the city, according to the Environment Municipal Secretary of São Paulo (2012),



the average green area per person is estimated to be 2.6 m², a very low amount compared to the 9 m² recommended by the WHO. This average is calculated based on public areas that can be frequented by the population, e.g., parks and squares. Furthermore, the vegetated areas are characterized by unequal spatial distribution, with the highest concentration of green areas in the south and north areas of the city, whereas the central and eastern areas, which are densely populated, contain a very low vegetated area, potentially causing the dissatisfaction among citizens. Thus, the current context reflects the deficient spatial planning of São Paulo in terms of green public areas and well-being, resulting from negligence regarding the maintenance of green areas in the city planning, combined with fast growth, urbanization, and land overvaluation. Besides the lack of nature and green spaces, the metropolis faces the usual challenges of big cities: traffic jams, air pollution, insecurity, food security concerns and so on.

Regarding agriculture in São Paulo, there are approximately 400 farms occupying a total area of 5,000 ha (Valdiones, 2013). Most of the farms are around 0.1 to 5 ha, except in the southern region, where farms are both larger and greater in number. In the central region, where most of the collective/community gardens are located, most gardens have less than 0.5 ha. Of these 400 farms, approximately 28 are organically certified and 60 are in agroecological transition. The main agricultural products in São Paulo are vegetables, medicinal herbs, ornamental plants, pork (in the northern region) and fruit (in the eastern region). These farms represent the commercial/for-profit category of urban agriculture suggested by McClintock (2014). Collective (or community) urban gardens, which will be described below, were not considered in Valdiones' study.

Agriculture in São Paulo is characterized by multiple types of farming, such as family farming, small enterprises, urban agriculture, community gardens, institutional gardens, homestead gardens and livestock production. In this study, we will focus on community gardens in public areas in the center of the city. Baron (2017), studying the Metropolitan Region of São Paulo (which involves 39 municipalities), found approximately 412 urban farms in 11 municipalities, varying from commercial, to institutional, collective, allotment and non-profit gardens. With respect to the community/collective gardens alone, the Urban Movement of Agroecology (MUDA) of São Paulo, the main collective movement that mobilizes and advocates for urban agriculture in the city, mapped collaboratively around 106 gardens in the central area of the city which Valdiones' study did not consider (MUDA, 2017).

It is important to note that within these studies, there is



Figure 2: Ciclista Community Garden
Photo credit: Pops Lopes

a lack of exact information regarding agriculture in São Paulo. Even though there have been projects dealing with agriculture for over 20 years, there has never been a qualitative study about agriculture in the city. Considering it is the biggest city in Latin America and recognized for its urbanized environment, agriculture never played a role in the city's economy or social life and, therefore, was invisible during its development (**Figure 2**). There is no information regarding the amount of vegetables produced in the farms and gardens throughout the city.

With respect to public policies, in 2004, São Paulo launched the Urban and Peri-Urban Agriculture Program (PROAURP) with law n. 13.727/04, which aims to support and encourage local production by helping to implement garden projects and establishing access to technical assistance, agroecological guidance, tools, seeds and other inputs (Secretaria Municipal do Verde e Meio Ambiente, 2013). In 2016, the Municipality created the first Municipal Plan for Food Security, which included urban



gardens in the actions to be supported until 2020. In the same year, the Municipal Conference for Rural Development was conducted with the participation of farmers and gardeners of the city, in order to define the priorities for the Rural Development Plan which will be created over the next years.

Due to the conjuncture of a few, disjointed policies addressing green spaces, the dissatisfaction of citizens regarding the amount of public green areas, and the lack of recreational and free space within the city, coupled with increasing access to the internet and social networks, an interesting movement arising from citizens towards a greener, healthier, more sustainable and more inclusive city started to gain strength and visibility in São Paulo.

The grassroots initiatives

In the last six years, a series of bottom-up initiatives arising from neighborhood communities, civil society groups, associations and NGOs have begun to emerge and gain strength in São Paulo. The initiatives address various topics concerning the quality of life and the rights of citizens in the city as agents of transformation with shared responsibilities for the management of their city and territory. These initiatives address topics such as the use and regeneration of public squares, mobility planning (e.g. prioritization of bicycle use and public transport improvements), urban gardens and agriculture in the city, and gender equality, among others.

In this context, a public group was created on Facebook in 2011 called Hortelões Urbanos (Urban Gardeners) in order to gather people interested in exchanging personal experiences with domestic organic food planting and also aiming to inspire the formation of community gardens. Although Hortelões Urbanos is not characterized as a political movement or association, members of the group actively work in community gardens and related initiatives (Hortelões Urbanos, 2017). When speaking about how the initiative started, Visoni (2014), an urban gardener and one of the founders of Hortelões Urbanos, stated that the city of São Paulo had reached a limit and the quality of life had fallen in recent years. These factors triggered people and collective movements willing to reverse this situation (Sesc São Paulo, 2014).

Therefore, from the social network discussions, some members of the Hortelões Urbanos took the initiative to promote meetings and to discuss strategies and actions of occupation of the public space in order to create community gardens (Nagib, 2016). The active members also organized meetings to exchange seeds, seedlings and information (**Figure 3**). The bottom-up initiative was thereby strengthened, and with the help of the local community, gave rise to many gardens spreading

throughout the city. Examples include the Hortas das Corujas (the first community garden which emerged from Hortelões Urbanos), Horta do Ciclista, Horta do Centro Cultural São Paulo, and Horta das Flores, among others. These gardens, created in the Hortelões Urbanos network, are mostly all considered collected/community gardens according to the categories suggested by McClintock (2014).

Regarding the common characteristics of emerging urban gardens in São Paulo, they are generally located in public spaces, without an official prior authorization for their installation. They are the fruit of community mobilization, so people living in the neighborhood come together to produce in the gardens through social media or territorially-based outreach. The cultivation of vegetables, fruits and medicinal herbs are for self-consumption. Furthermore, anyone has the right to harvest and eat the production, since the garden is located in a public space. The community understands that everybody has the right to benefit from it. The amount of food produced is not large enough to feed its participants, due to the small size of the gardens, the challenges of self-organization, and the lack of technical support to enhance production. However, it does produce enough to supply the volunteers with complementary food.

There are not any scientific studies that have conducted in-depth research on the profile and motivations of participants in São Paulo's urban gardens. Through our active participation, observation and informal conversations with the core groups of volunteers in Horta das Corujas, Horta do CCSF, Horta das Flores, Horta da Saúde, Horta City Lapa, Horta do Ciclista and Horta da FMUSP, we could perceive three different levels of volunteer engagement and estimate the following number of participants in each urban garden. The first, the core group, is formed by approximately 10 participants, who organize the activities and care most intensely for the garden. The second, the participants group, is dynamic and encompasses approximately 40 people, which frequently participate in the task force days. The third, the support network, is the most dynamic group, involving roughly 100 or more people who support the garden and participate occasionally. Many of those people from the support network participate in more than one garden, and some volunteers from the core or the participant group from one garden participate in the support network of another. Unfortunately, there is not any scientific research providing more accurate data regarding the dynamics of such participation.

Regarding the internal organization and task division, each garden organizes daily care and task force days. The collective work, symbolically called "mutirão," an



Figure 3: E - São Paulo`s Cultural Center Community Garden (Horta CCSP)
Photo credit: Pops Lopes

indigenous tupi word which means "working together," represents the self-driven task force day, in which people manage and organize the tasks to be done in the gardens in a horizontal decision-making process. Moreover, in parallel to the emergence of urban gardens in São Paulo, a platform to support organic agriculture in the city was formed and coordinated by 3 key institutions: 5 Elementos NGO, Kairos Institute, and Associação de Agricultura Orgânica (Organic Agriculture Association, AAO), combined with other NGOs and cooperative organizations of urban and rural farmers of the city. The Platform was responsible for discussing proposals to support agriculture in the city and to articulate the topic with politicians. More specifically, these were three legislative councilors belonging to different political parties who were supporters to the cause.

As part of a dynamic process, complementary to the Hortelões urbanos and the Platform, a third movement

emerged in 2014. The Movimento Urbano de Agroecologia (Agroecology Urban Movement, MUDA) proposed the creation of a greener city reconnected to nature; the promotion of family farming; the construction of a fair and solidary productive chain; and the responsible and collective occupation of the public space (MUDA, 2017). In this regard, one of main projects put in place by MUDA, with the support from the Municipality, is called Cidades Comestíveis (Edible Cities), which aims to promote urban agriculture in São Paulo through a collaborative platform for the exchange of resources, knowledge and work among urban gardeners. Moreover, MUDA played a role in creating a map of the city of São Paulo and surroundings pointing out the community gardens, organic free markets and restaurants; creating an organic free market in Villa Lobos Shopping Center, which helps urban farmers in the commercialization of their products throughout the city; enhancing permaculture movements in the peripheries, such as PermaPeri-



fa Network; and intervening directly in the development of public policies and social accountability.

Regarding the peripheries and low-income neighborhoods, there are several initiatives that demonstrate the possibility for income generation through urban gardens, such as the Association of East Region Agricultures (AAZL, n.d.). Commercial agriculture has been recognized by the municipal councils and the municipality as a way to promote the development of low-income families. The reclaiming of the rural zones in the Municipal Strategic Plan is an example of this.

There are also examples of non-profit and community gardens in low-income neighborhoods, such as Vila Nova Esperança Garden (in the Vila Nova Esperança neighborhood), Quebrada Sustentável Garden (in the São Miguel Paulista neighborhood) and Horta Cores e Sabores (in the Capão Redondo neighborhood), and we suspect more of them exist, but are not mapped. Some of these gardens have been supported by the municipality through income transfer programs (as a scholarship), but do not have frequent technical support to develop their activities. In addition, low-income populations do have a will for food production as a means to alleviate poverty, but they lack official support from the municipality to develop residential and collective gardens for self-consumption, and also face land use, water and self-organization challenges. There is a potential social structure and capital in low-income communities for urban agriculture to grow and develop in São Paulo, but the fragility of public policies targeting these populations restrain it.

Nevertheless, we believe that the initiatives presented in this article are helping to develop a critical mass to influence public policies to enhance budget and public structures to allow the functioning of a broader urban agriculture program. In summary, three parallel bottom-up initiatives were presented: (i) the Hortelões Urbanos, a Facebook group in which many gardening initiatives arose, all of them acting within neighborhoods to create community gardens; (ii) the Support Platform for Organic Agriculture, performing on the public policy issues, and (iii) the MUDA, playing the role of connecting and advocating for stakeholders with the political actors in order to influence the policies and planning of the city as a response to the demands of citizens. In addition, a recent discussion has been conducted in the horizontal sphere of the gardeners in São Paulo with the intention to create a community garden association. The aim is to enable the organization of gardeners to enter a dialogue with the public authorities about the regularization of the gardens and other support from the municipal-

ity. Therefore, we can perceive that the described bottom-up initiatives are complementary, recent and very dynamic. Some advances and challenges in this ongoing process will be analyzed subsequently.

Findings and discussions

Impacts on governance: Advances regarding the urban agriculture agenda

On a very local scale, the urban gardens have flourished and reinforced the citizens' demand for more public spaces in São Paulo that accomplish multiple functions (e.g. contact with nature, food production, learning and leisure, education and social interactions) and serve as elements that place citizens as owners who are co-responsible for the well-being of their territory.

Since the local, bottom-up initiatives started around 2011, their ideas and strategies were quickly disseminated through social media, which enabled a connection to be made between citizens to discuss urban agriculture, either in private or public spaces, to exchange their experiences and inputs, as well as to plan joint actions to start community gardens in public spaces. As stated by Rabello (2016), although the gardens cultivated in the metropolis were initially rare, now they have engaged enough people willing to develop more greenery within the city. In addition, in most of these gardens, organic farming is preferred. Thus, from the concrete actions of building urban gardens, it also triggered positive advances regarding research in academia, dialogue with public authorities as well as broader civil society participation, and influenced discussions concerning policies and strategies for urban agriculture in São Paulo.

Regarding the main achievements and political role arising from the urban gardens movements impacting the public policies, it's possible to emphasize two main actions. First, the mobilization of a representative group of urban gardeners in order to participate in the public hearings to build the Municipality's Goals Plan and the São Paulo's Strategic Master Plan of 2014 (Plano Diretor Estratégico, PDE) pushed the discussion to strengthen agriculture in the city planning and agenda and contributed to the social control of public policies. Second, the urban gardeners participated in the municipal councils and conferences which address food security and rural development issues in order to actively contribute in the proposition of public policies that meet the demands of citizens for a better food system, a greener city and a common management of public spaces.

Indeed, in 2014, the concept of rural areas in the city was reinserted into the São Paulo Master Plan, including the



new idea of multifunctionality, i.e. rural areas as a place for food production, water supply, leisure and ecotourism. The recognition of rural area includes the objectives of restraining urban expansion, encouraging organic farming, sustainable management of natural resources, and preserving natural ecosystems (PDE, 2014). Aside from these three main achievements, other advances were perceived by the gardeners in their dialogue with politicians, such as the elaboration of a proposed law which establishes the gradual insertion of organic food into school meals, as a means to encourage healthier nutrition for students, and the strengthening of local organic producers in São Paulo. Furthermore, in 2015 the Municipal Law n. 16.212 provided guidelines including community gardens in the use of public squares and involving more actively the Municipality in the management of these projects. The activist approach of MUDA, in dialogue with the Municipality, also achieved other benefits for the farmers, such as the maintenance of Ibirapuera's Organic Free Market and the approval of budgets for the urban gardens.

The bottlenecks

With regard to the current bottlenecks to urban agriculture development, although the São Paulo Strategic Plan 2014 has recognized the existence of rural areas, there is still a lack of regularization of community gardens. For this purpose, the city must officially recognize the existence of these gardens. According to Luis Henrique Marinho Meira, Environment Specialist in the Municipality of São Paulo, the Urban and Peri-urban Agriculture Program (PROAURP) legislation addressed the establishment of a register of available land for gardening in the city. The Municipality would manage the register of the farmers in order to enable the regularization and management of the activity. Nonetheless, this question did not advance. Another obstacle is the fragmented public policies on the topic of urban agriculture (Miguel, 2016). Furthermore, the procedure to set up a new garden and the process to find out if the property is public or private remains a challenge. In this sense, the issue should be actively addressed by the Municipality, acknowledging the current legislation on the topic and the demands of the urban gardens. Therefore, the lack of political support and budget for urban agriculture programs and the low acknowledgment of the existing laws negatively affect the creation of new gardens and the continuity of the existing gardens. Finally, other obstacles concern the changes in the political context and partners related to the lack of continuity in the programs and policy action across each election. Besides that, the gardeners must currently exert concentrated efforts to demand the municipality's support in order to access available resources in the city, e.g., organic waste that could be used to

produce compost for the gardens.

Urban gardens, social innovation and social capital in São Paulo

From the perspective of Baycan-Levent et al. (2009) regarding multifunctional greenspaces and considering the conception and profile of the emerging urban gardens in São Paulo, we can see that they generally accomplish the following five functions:

- (i) Ecological value: when reintroducing gardens into urban space, besides the food production, there are others gains related to biodiversity and the dominantly organic production in the gardens, coupled with practices that promote soil and water conservation and its secondary benefits such as the temperature control, the balance of the micro-climate, the creation of fauna refuge and so on.
- (ii) Economic value: the urban gardens described are not necessarily market oriented, but can serve as a supply of food for self-consumption, independent from market relations. Therefore, the money saved on food can be invested in other needs.
- (iii) Social value: some of the most remarkable impacts are related to the creation of proximity and social cohesion in neighborhoods, the strengthening of the feeling of belonging of citizens within their territory, and reaffirmation of "the right to the city" for citizens, thus promoting social capital.
- (iv) Planning value: the regeneration and re-signification of abandoned areas through urban gardens boost the discussions addressing green space policies and planning in São Paulo. In this case, the urban gardens play a role in the creation of political capital of citizens, engaging them in discussion about city planning, increasing social accountability and participation, as well as promoting urban resilience by reducing the dependency of the city on large chains of food production.
- (v) Multidimensional value: the positive impacts from urban gardening pass from the local scale to the city scale, influencing research and discussions in academia as well as in the political sphere, resulting in the integration of urban agriculture into legislation, budgets, policies and the agenda of the city.

From the perspective of social innovation, we verified that the urban gardens initiatives in São Paulo are one among other initiatives that have emerged as a reaction to the dissatisfaction of citizens and civil society organizations to the low quality of life. Therefore, this São Paulo study case illustrates the statement of Moulaert (2009) about how the mechanisms of crisis and recovery provoke and accelerate social innovation led by bottom-up



actors. Other elements that allow us to analyze the emerging urban gardens in São Paulo in light of social innovation concern the processes of transformation and empowerment of citizens and neighborhoods through their mobilization to pursue their collective needs. In this regard, the concept of social capital interacts with social innovation, as the urban gardens serve as space not only for building trust among the participants, but also for capacity building, knowledge sharing and political engagement.

The bond created between the urban garden participants has enhanced their sense of affiliation to a group, which is territorially based, enabling the creation of new institutional arrangements which confront the local power of the Municipality and engage them in participation in policymaking, thus increasing social accountability and enhancing local governance. Moreover, the initiatives have advanced to upper levels of governance, besides the horizontal articulation among urban gardeners from different neighborhoods, gaining strength with the support of associations, NGO's, and academia. The subsequent expansion of the demands to the political sphere has triggered positive outcomes to urban agriculture's visibility, territorial planning and the agricultural agenda in public policies in São Paulo.

The success and spread of the urban gardens in São Paulo also illustrates the IAD pillars, such as the satisfaction of territorially-based needs (in this case, 'citizen' needs related to the contact with nature, production of healthy and fresh food, the exchange of information, and regeneration of the public space) add value to the green areas in the city and contribute to the strengthening of this agenda. Another noteworthy IAD pillar relates to the innovations in social relations and institutional arrangements. In this regard, the Support Platform for Organic Agriculture and the Urban Gardens represents an innovative arrangement of citizens and political actors, which contributes to enhanced democracy. By doing so, this process has combined different scales and bottom-up initiatives to address the citizens' needs using diverse models of organization (via Facebook groups, Platform, and political movements).

The initiatives, articulated through a network of political actors acting on different levels, promote dialogue and strategies to advance agreements with the municipality in order to promote food security, access to urban resources and achieve sustainability. Such elements illustrate the concept of land democracy (Abelman, 2015) in urban space as a "field of negotiation between people, places", and power (p. 105). This mobilization has shaped new and strong relations among urban gardening com-

munities. Therefore, the process of raising awareness, empowerment and building social and political capital are present in their actions, transforming the space and evolving towards common achievement of more support to develop their activities.

Moreover, besides self-consumption, the community gardens contribute to the educational process, combining environmental awareness with a learning-by-doing process, in which knowledge and different world views are shared, confronted and used for decision making over the garden management. From the perspective of political action, the urban gardens also express citizens' rights to the city and work as a territorial platform where neighbors meet, discuss issues related to the garden (and beyond), and agree over needs and challenges for urban agriculture to thrive in the city.

Also, it is worth pointing out the locally-embedded profile of the urban gardens and their independence from other gardens and from the Municipality. Urban gardens are able to independently decide the arrangement of their space according to their specific needs, as well as decide their partnerships and strategies in each neighborhood. Self-organization plays a key role in citizens' rights to city, as the public space is occupied and managed directly by the people, contributing to a better usage of resources and social accountability. In addition, the aspiration to create the community gardens association, if brought to fruition, could also strengthen the struggle and negotiation of urban gardeners for more rights. Finally, the initiatives presented in the São Paulo case study are quite recent and dynamic, but they have gained strength locally and at the municipal level.

Conclusion

The fast growth of population, the urbanization process and economic development in São Paulo have resulted in negligence regarding planning and policies that prioritize the citizens' well-being, leading to decreased quality of life in the city. Thus, while planning the city for citizens seems obvious, it has not always been pursued. Therefore, the recent emergence of urban gardens in São Paulo has very positively impacted mobilization of different actors in various scales of action. Citizens, neighborhoods, civil society organizations, farmers associations and researchers in academia are engaged in dialogue with politicians in order to achieve more rights and support for green spaces in city, such as urban gardens. In order to advance the cause further, it is also crucial to guarantee continuous engagement from the Municipality through the creation of spaces for dialogue with officials and public consultations, as well as



to form a commitment to build solid laws and programs and direct budget for urban agriculture consolidation in São Paulo. Nonetheless, the urban gardens already serve multiple roles besides food production, such as education and environmental awareness, the process of learning by doing, and providing spaces of leisure, cooperation and well-being. The gardens play a remarkable role in citizens' empowerment, placing citizens as the main agents of change, transforming spaces, building relations, and joining forces that are impacting practices and policies at the local and municipal level. Therefore, these initiatives have proven to be a strong movement with a holistic approach, combining territorial action and social cohesion as a political strategy capable of re-appropriating public spaces and engendering a shift of power relations to positively influence sustainability, well-being and democracy in São Paulo and in other cities.

Acknowledgements

The authors are thankful for the collaboration of the urban garden volunteers, as well as the practitioners and activists from NGOs, farmers associations, and also government officials that tirelessly engage in the promotion of a healthier, greener and food secure city. We would also like to thank our research institutions, such as the Department of History, Geography and Antiquity Sciences (DissGea), Università Degli Studi di Padova, the University of Leuven, the Environmental Education and Policy Laboratory (OCA), and the Interinstitutional Programme of Applied Ecology (PPGI-EA), University of São Paulo (USP). We also acknowledge the Università Degli Studi di Padova and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for the scholarship support, which guaranteed the realization of this research.

Conflict of Interests

The authors hereby declare that there is no conflict of interests.

References

Abelman, J. (2015). Cultivating the City: Infrastructures of abundance in urban Brazil. *Future of Food: Journal on Food, Agriculture and Society*, 3(1), 101-109.

Ackerman, K. (2011). *The potential for urban agriculture in New York City: Growing capacity, food security, and green infrastructure*. New York, NY: Urban Design Lab at the Earth Institute Columbia University.

Almeida, D. A. O. De. (2016). *Isto e aquilo: Agriculturas e produção do espaço na Região Metropolitana de Belo*

Horizonte (RMBH) (Doctoral dissertation). Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, Brasil. Angotti, T. (2015). Urban agriculture: Long-term strategy or impossible dream? Lessons from Prospect Farm in Brooklyn, New York. *Public Health*, 129(4), 336-341.

Associação de Agricultores da Zona Leste. (n.d.). Retrieved October 28, 2017 from <http://agricultoreszonal-este.org.br/>

Barbizan, T. S. (2011). *Integrating urban and peri-urban agriculture into public policies to improve urban growth: São Paulo as a case study* (Master Dissertation). University of Technology, Berlin, Germany.

Baron, B. C. (2017). *Agroecologia e urbanidade: uma investigação a partir da agricultura urbana na Região Metropolitana de São Paulo* (Bachelor Thesis). Faculdade de Filosofia, Letras e Ciências Humanas (FFLCH/USP), São Paulo, Brazil.

Baycan-Levent, T., & Vreeker, R., Nijkamp, P. (2009). A multi-criteria evaluation of greenspaces in European cities. *European Urban and Regional Studies*, 16 (2), 219-239.

Beem, C. (1999). *The necessity of politics. Reclaiming American public life*. Chicago, IL: University of Chicago Press.

Bourdieu, P. (1986). *The forms of capital*. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). New York, NY: Greenwood.

Chambon, J. L., David, A., & Devevey, J. M. (1982). *Les innovations sociales*. Paris: Presses Universitaires de France.

Cidades Comestíveis. (n.d.). Retrieved April 29, 2017 from <http://www.cidadescomestiveis.org/projeto/>

Coleman, J. C. (1994). *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.

Coleman, J. C. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, S95-S120.

Cornwall, A., & Coelho, V. S. (2007). Spaces for change? The politics of participation in new democratic arenas. In A. Cornwall, & V. S. Coelho (Eds.), *Spaces for change?* (pp. 1-25). London: Zed Books.

Costa, C. G. A. (2015). *Agricultura Urbana e Periurbana*



- na Ótica da Promoção da Saúde (Doctoral Dissertation). Faculdade de Saúde Pública, Universidade de São Paulo, São Paulo.
- Deelstra, T. & Girardet, H. (2000). Urban agriculture and sustainable cities. In N. Bakker, M. Dubbeling, S. Guendel, U. Sabel-Koschella, H. Zeeuw (Eds.), *Growing cities, growing food: Urban agriculture on the policy agenda* (pp. 43-65). Feldafing: Deutsche Sitffung für Internationale Entwicklung.
- Draus, P.J., Roddy, J. & McDuffie, A. (2014). 'We don't have no neighbourhood': Advanced marginality and urban agriculture in Detroit. *Urban Studies*, 51(12), 2523-2538.
- Drechsel, P., Thebo, A. L., & Lambin, E. F. (2014). Global assessment of urban and peri-urban agriculture: Irrigated and rainfed croplands. *Environmental Research Letters*, 9(11), 114002.
- Van Dyck B., & Van den Broeck, P. (2013). Social innovation: A territorial process. In F. Moulaert, D. MacCallum, A. Mehmood, A. Hamdouch (Eds.), *The international handbook on social innovation: Collective action, social learning and transdisciplinary research* (pp. 131-141). Northhampton, MA: Edward Elgar Publishing Limited, Inc.
- Encontro Nacional de Agricultura Urbana . (2015). *Carta Política do Primeiro Encontro Nacional de Agricultura Urbana - ENAU" 21 a 24 de outubro - Rio de Janeiro, RJ*. Retrieved May 03, 2017 from http://agriculturaurbana.org.br/UAalliance/carta_enau.html
- Euromonitor International. (2017, February). São Paulo city review. Retrieved April 27, 2017 from <http://www.euromonitor.com/sao-paulo-city-review/report>
- Evans, B., Joas, M., Sundback, S., & Theobald, K. (2005). *Governing sustainable cities*. London: Earthscan.
- Field, J. (2003). *Social capital*. London: Routledge.
- Food and Agriculture Organization. (1999). *Taking stock of the multifunctional character of agriculture and land*. Conference papers for FAO/Netherlands Conference on The Multifunctional Character of Agriculture and Land, Maastricht, Netherlands, September 12-17, 1999. Retrieved from http://www.fao.org/mfcal/pdf/st_e.pdf
- Food and Agriculture Organization. (2010). *Growing greener cities in Latin America and the Caribbean*. Rome: Food and Agriculture Organization. Retrieved from <http://www.fao.org/3/a-i3696e.pdf>
- Giddens, A. (1990). *The consequences of modernity*. Cambridge: Polity.
- Hannifan, L. J. (1920). *The community center*. Boston, MA: Silver Burdett.
- Hannifan, L. J. (1916). The rural school community center. *Annals of the American Academy of Political and Social Science*, 67, 130-138.
- Hildyard, N., Hedge, P., Wolvekamp, P., & Reddy, S. (2001). Pluralism, participation and power: Joint forest management in India. In B. Cooke, & U. Kothari (Eds.), *Participation: The New Tyranny* (pp. 56-71). London: Zed Books.
- Huylenbroeck, G. V., Vandermeulen, V., Mettepenning, E., & Verspecht, A. (2007). *Multifunctionality of agriculture: A review of definitions, evidence and instruments*. *Living Rev. Landscape Res.*, 1, (2007), 3. Retrieved from <http://www.livingreviews.org/lrlr-2007-3>
- Instituto Brasileiro de Geografia e Estatística. (2017). São Paulo Panorama. Retrieved April 12, 2017 from <http://cidades.ibge.gov.br/xtras/perfil.php?codmun=355030>
- Leeuwen, E. S., Nijkamp, P. & Vaz, T. D. (2010). The multifunctional use of urban green space. *International Journal of Agricultural Sustainability*, 8(1-2), 20-25.
- Macnaghten, P., & Urry, J. (1998). *Contested Natures*. London, UK: SAGE Publications.
- McClintock, N. (2014). Radical, reformist, and garden-variety neoliberal: Coming to terms with urban agriculture's contradictions. *Local Environment*, 19(2), 147-171.
- Miguel, S. (2016, December 02). Agricultura urbana, articulação social e poder público em pauta. Instituto de Estudos Avançados da Universidade de São Paulo. Retrieved March 12, 2017 from <http://www.iea.usp.br/noticias/agricultura-urbana-articulacao-social-e-poder-publico-em-pauta>
- Mougeout, L. J. A. (2000). Urban agriculture: Definition, presence, potentials and risks. In N. Bakker, M. Dubbeling, S. Guendel, U. Sabel Koschella, & H. De Zeeuw (Eds.), *Growing cities, growing food, urban agriculture on the policy agenda*. Feldafing: Deutsche Sitffung für Internationale Entwicklung.
- Mougeout, L. J. A. (2006). *Growing better cities: Urban agriculture for sustainable development*. Ottawa, ON: International Development Research Centre.



- Moulaert, F. (2009). Social innovation: Institutionally embedded, territorially (re)produced. In F. Moulaert, D. MacCallum, A. Mehmood, A. Hamdouch (Eds.), *The international handbook on social innovation: Collective action, social learning and transdisciplinary research* (pp.11-24). Northampton, MA: Edward Elgar Publishing Limited, Inc.
- Moulaert, F., & Mehmood, A. (2011). Spaces of social innovation. In A. Pike, A. Rodriguez-Pose, J. Tomaney (Eds.), *Handbook of local and regional development* (pp. 212-225). London: Routledge.
- Movimento Urbano de Agroecologia. (2017). O que é o MUDA-SP and Mapa da Mudança. Retrieved April 29, 2017 from <http://muda.org.br>
- Nagib, G. (2016). *Agricultura urbana como ativismo na cidade de São Paulo: o caso da Horta das corujas* (Master thesis). Faculdade de Filosofia, Letras e Ciências Humanas (FFLCH/USP), São Paulo, Brazil
- Oliveira, L. C. P. (2017). *de Redes, ideias e ação pública na agricultura urbana : São Paulo, Montreal e Toronto 2017*. (Doctoral dissertation). Escola de Administração de Empresas de São Paulo (EAESP), Fundação Getúlio Vargas (FGV), São Paulo, Brazil.
- Olsson, E. G. A., Kerselaers, E., Søderkvist Kristensen, L., Primdahl, J., Rogge, E., & Wästfelt, A. (2016). Peri-urban food production and its relation to urban resilience. *Sustainability*, 8(12), 1340.
- Pourias, J., Aubry, C., & Duchemin, E. (2016). Is food a motivation for urban gardeners? Multifunctionality and the relative importance of the food function in urban collective gardens of Paris and Montreal. *Agriculture and Human Values*, 33(2), 257-273.
- Prefeitura de São Paulo. (2016, June 15). Prefeitura lança mapa colaborativo para o desenvolvimento rural sustentável em São Paulo. Retrieved May 03, 2017 from <http://gestaourbana.prefeitura.sp.gov.br/noticias/prefeitura-lanca-mapa-colaborativo-para-o-desenvolvimento-rural-sustentavel-em-sao-paulo/>
- Prefeitura de São Paulo. (2013, March 21). Programa de Agricultura Urbana e Periurbana. Secretaria Municipal do Verde e do Meio Ambiente. Retrieved March 12, 2017 from http://www.prefeitura.sp.gov.br/cidade/secretarias/meio_ambiente/servicos/proaurp/index.php?p=30091
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York, NY: Simon and Schuster.
- Rabello, T. (2016, June 19). À procura de hortas em plena São Paulo. O Estado de São Paulo. Retrieved April 25, 2017 from <http://emails.estadao.com.br/blogs/alimentos-organicos/a-procura-de-hortas-em-plena-sao-paulo/>
- Ramos, S. (2014, November 14). Agricultura urbana e o novo plano diretor Estratégico do Município de São Paulo: Promoção à sustentabilidade ambiental e à saúde nas metrópoles. *Análises e Indicadores do Agronegócio*, 9(11). Retrieved from <http://www.iea.sp.gov.br/ftp/iea/AIA/AIA-55-2014.pdf>
- Rezende, F. (2016, June 22). Agricultura urbana. Instituto de Estudos Avançados da Universidade de São Paulo. Retrieved May 03, 2017 from <http://www.iea.usp.br/pesquisa/grupos-de-estudo/grupo-de-estudos-de-agricultura-urbana/grupo-de-estudos-de-agricultura-urbana>
- Rodrigues, A., Deodoro, J. (2012, May 14). SP tem só 2,6m² de verde por pessoa. Estado de São Paulo. Retrieved April 02, 2017 from <http://brasil.estadao.com.br/noticias/geral,sp-tem-so-2-6-m-de-verde-por-pessoa,872978>.
- Sesc São Paulo. (2014, February 07). São Paulo também é verde. Retrieved April 29, 2017 from https://www.sescsp.org.br/online/artigo/7338_SAO+PAULO+TAMBE-M+E+VERDE
- Valdiones, A. P. G. (2013). *Panorama da agricultura urbana e periurbana no município de São Paulo* (Master Thesis). Escola de Arte, Ciências e Humanidades (EACH/USP), São Paulo, Brazil.
- World Bank. (2010). Social capital. Retrieved July 05, 2017 from <http://go.worldbank.org/COQTRW4QF0>
- World Health Organization. (2010). Urban Planning, Environment and Health: From Evidence to Policy Action. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0004/114448/E93987.pdf?ua=1