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Cultivating changes: Urban Agriculture as a tool for socio-spatial transformation

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Abstract

Urban gardening initiatives have evolved from their original purpose of food production to assume aesthetic, recreational, educational, social, or therapeutic functions. The general objective of this paper was to determine the new socio-spatial configuration into which these experiences have been implemented, in order to determine the diversity of actors involved in urban agriculture (UA) within the municipality of Perugia. Secondary objectives were to explore the social and environmental capital produced and to indicate orientations and suggestions to enhance the impact of UA within the city. The survey, conducted during 2015 and 2016, focused on seven UA initiatives or projects and demonstrated that there is an increasing social demand for the reintegration of agriculture within urban areas. At the same time, there is a lack of coordination between the different initiatives, plans, and programmes to enhance these projects. It is necessary to take advantage of the intense activity, creativity, ideas, and actors involved in UA to improve the connections and synergy to implement these initiatives. Furthermore, we show that the municipality could develop and implement specific tools and devices to allow institutions, private citizens, associations, and farmers to operate in more synergistic and efficient ways.

Introduction

Urban agriculture (UA) has strong historical roots. Over the years, the linkages between cities and agriculture have evolved and new geometries of urban spaces are arising. Different types of UA have developed around the world, due to varying socio-economic and territorial contexts. Studies have addressed the characterisation of UA (Simt, Ratta & Nasr 1996; Veenhuizen & Danso, 2007) and determined that the research field remains open because shared definitions or established criteria to understand the complexity of UA and its ongoing dynamics do not exist. However, two major categories can be distinguished within UA: gardening oriented to leisure and education, and farming for commercial purposes (Simon-Rojo et al., 2016).

In this article, we refer to the urban food gardening initiatives that encompass "agricultural activities with generally low economic dependence on material outputs, while using the production of food for achieving other, mostly social, goals" (Simon-Rojo et al., 2016, p.22). UA can be classified according to the form of organization of production; we can distinguish between allotments and family gardens, where the plots are cultivated individually, and therapeutic and educational community gardens, were the production is collective (Branduini, Giacchè, Laviscio, Torquati, and Scazzosi, 2016a). At the same time, the differences between these classifications are blurring (Loget & Ruau, 2013). For example, in community gardens, plots can be individual, with food production as the central purpose; while in family gardens, common spaces can exist for sharing conviviality and leisure moments. It is also apparent that the economic

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and productive aspects of UA are acquiring increasing relevance. Some researchers have investigated how urban food gardening and urban farming initiatives have developed in different aspects (e.g. actors, localisation, classification, form of organization, and mapping) at the national level (Arzeni & Sotte, 2016; Branduini, Giacchè, and Laviscio, 2016b).

Concerning the classification aspect, Cavallo, Di Donato, Guadagno, and Marino (2013), in a preliminary analysis of UA in Rome metropolitan areas, reconstructed the causal relationships interpreted by agricultural production models, in the specific form of the spatial and functional urban dimension (both physical and social). Regarding management, Vescovi (2012) analysed an Agricultural Park close to Milan with the aim of identifying management best practices for maintenance, and to qualify areas for creating new connections between urban and agricultural settings. Gisotti (2015, p. 207) considered the agricultural park as a "trait d'union" between the city and countryside, especially in the contemporary metropolitan context. Focusing on the Florence plain, Gisotti (2015) has evaluated new planning attempts at the territorial scale using the agricultural park as a tool to recreate relationships between the urban and rural space. Concerning the function and role-played by urban and peri-urban agriculture, Poli (2016) highlighted the central role of peri-urban agriculture in food security and social justice in the Florence area.

Cognetti et al. (2012) and Cognetti & Conti (2014) have focused on the social functions of some projects and initiatives of UA within the Milan municipality, underlining how community gardens represent a vehicle to connect the citizens and the community created through UA with the territory. Related to the Milan metropolitan area, Cativelli (2014) demonstrated that the experiences of UA in the region have changed the consumption habits of the population. Relating to the mapping of UA in some metropolitan areas of the USA and Europe, including Rome and Milan, Lupia (2014) collected and analysed several web-mapping projects considering several attributes (e.g. author, aim of the projects, typology of UA mapped, technological tools employed, etc.) and outlined their features.

Regarding the policies associated with UA, Ingersoll, Fucci, and Sassatelli (2007) presented a discussion that considered UA as a tool to enhance the quality of the landscape and social connections in Emilia Romagna (Italy) in general, and particularly in Bologna. Also in Bologna, Djalali (2007) suggested that a network of extension services, supporting production, marketing, consumption and waste management activities, and stimulating people's participation in urban food processes were important for the development of UA. Focusing on metropolitan area of Turin, Gottero (2016) suggested that the complexity of issues involving UA, common to many European countries, require a "site-specific solution" in which all authorities are involved and civil society has to establish new types of public policies and new forms of governance that consider the large number of values. Only in this way can agriculture contribute to the regeneration of urban areas, defining new horizons for the transformation, and acting as a catalyst for the regeneration and upgrading of underutilized and degraded residual open spaces. As underlined by Abelman (2015), UA should integrate into the urban fabric of a metropolis, creating a framework for spatial change as well as social investment and development. What are the factors and elements that enable this integration? Which elements contribute to promote and enhance agriculture within the cities?

This paper aims to investigate the diversity of actors involved in urban agriculture within the municipality of Perugia and describe the new socio-spatial configuration into which these experiences have been implemented. A secondary objective is to explore the environmental and social capital produced by UA, and provide suggestions to enhance the impacts of UA within the city. To quantify environmental capital, we considered "all the investments (socio-economic, ideological, emotional, political, artistic, etc.) in the environment made by actors according to their representations, interests, and specific value systems" (Richard, Saumon, and Tommasi, 2015).

Materials and Methods

This paper is based on the results of an empirical investigation conducted between April 2015 and October 2016 in the municipality of Perugia, Italy. The city of Perugia was chosen for reasons related to the characteristics of the city, and the engagement of the city-dwellers and local authorities. Firstly, Perugia, the capital city of the Umbria Region, with 165,668 inhabitants (ISTAT, 2015), is one of 105 medium-sized Italian cities that have been assigned a functional and strategic role within European development policies (Tortorella, 2013). Secondly, the Province of Perugia fostered one of the first public programs for promoting UA in the 1970s, and several community, educational, and therapeutic gardening projects have arisen in recent years.

Before starting the survey, a preliminary review was conducted through photo interpretation, site visits, and interviews with key stakeholders to identify UA initiatives and projects. Eight different types of urban food gardens were detected and seven of the eight have been analysed. The private family garden classification was not

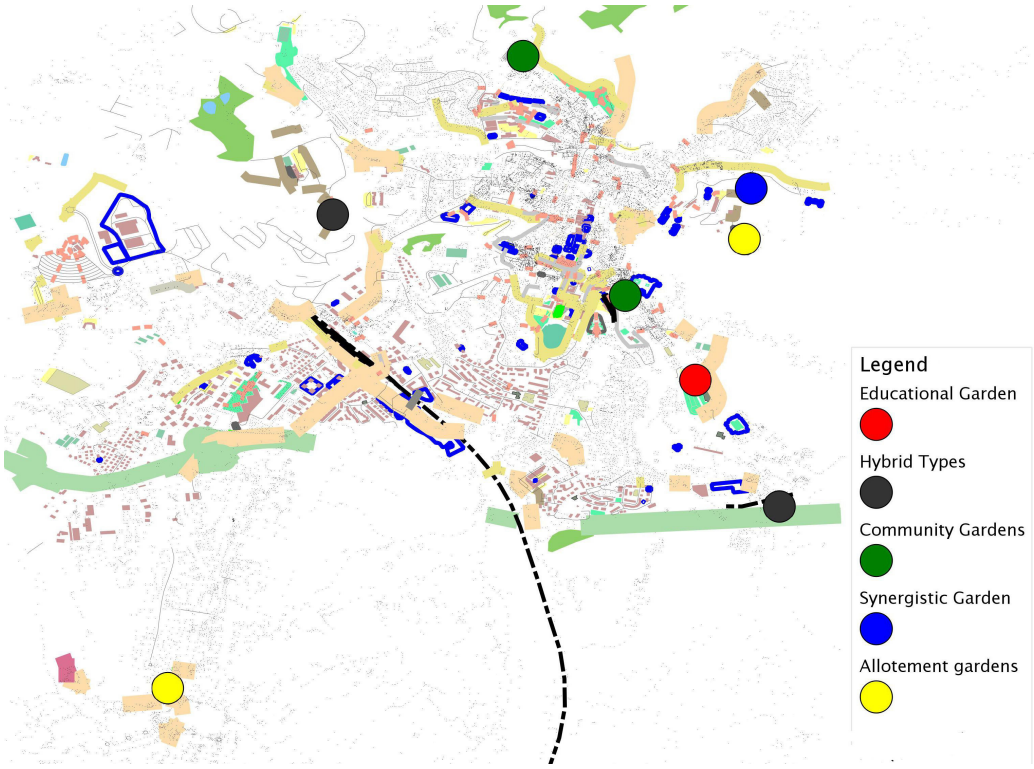

Figure 1: Localization of the cases studied (Source: Elaborated by the authors based on open street map (© OpenStreetMap contributors))

investigated in this study. The principal tools adopted to carry out this research were interviews and, when possible, participant observation. We considered that combining the two methods could allow for a greater understanding of the difference between the discourse that emerged during interviews and the practices observed during direct participation.

Approximately 20 people, including gardeners, garden supervisors, representatives of institutions, associations, and private operators were interviewed. The data were analysed using a reading grid and a qualitative analysis of the responses was performed. The participant observation method was adopted for the two community gardens. Furthermore, we participated in some meetings and events organised by the associations and the collective involved in UA. Taking notes on the proceedings and recording the actors, including their speech, practices, and interpersonal dynamics always accompanied observations.

Urban Food Gardening typologies within the municipality of Perugia

Eight typologies of UA belonging to the category of Urban Food Gardening have been identified within the urban settlement of Perugia and its surroundings (1 km from the border of the city, **Table 1**) and seven of the eight types have been analysed (**Figure 1**). These comprise approximately 60 plots of land cultivated as urban food gardens. There are approximately 50 plots belonging to private houses, two community gardens promoted by local associations, one therapeutic garden promoted by a social cooperative, one educational garden promoted by a university and its students, two allotment gardens on public land and cultivated by retirees, and two gardens belonging to a hybrid category being both allotment gardens and urban farms.

Actors, forms of organization, goals, and policies

During the 1970s, the province of Perugia promoted the first social program to create two areas reserved as allotment gardens in the suburbs of the city. In this period, entire rural families, especially former sharecroppers, migrated to the cities. In Umbria, these families migrated to Perugia, the capital city of the region, searching for better living conditions, work, and aspiring to improve their social status. The reality did not often meet their expectations. As former farmers commenced work in factories, they faced marginalisation and exclusion, living only in the periphery of the city. In order to improve their situation and reduce the traumatic separation from the countryside that became worse with retirement, the Perugia Province created a number of allotment gardens. The Province allocated a suburban area of Perugia, the Ponte della Pietra district, and assigned plots to retirees for gardening. These allotments occupied their leisure time and helped the former farmers to regain confidence in their abilities.

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Table 1: Typologies' characteristics (Source: Elaborated by the authors)

TYPES			FUNCTION			ACTORS		
Typologies of Urban Food Gardening		**Year**	**Main Goal**	**Secondary goals**	**Promoter**	**Funder**	**Users**	**Land owner**
Family garden	50 private gardens							Private
Allotment gardens	Orti di Ponte della Pietra	1977	social integration	self-consumption / leisure/ environmental protection	Province of Perugia	Province of Perugia	Elderly People	Public
	Orti di Parco Santa Margherita	1990						
Educational garden	University Garden	2015	social integration	educational and leisure	University of Perugia		Pupils and inhabitants of Borgo XX Giungo district	Public
Therapeutic garden	Synergistic gardens	2013	social-care	social, educational, environment protection,	Social Cooperative and ASL	ASL	People with disabilities	Public
Community garden	Ortobello	2015	urban abandoned space repurposing	social, educational, environment protection,	Association of Neighborhood	Private	Inhabitants of Borgo XX Giugno district	Public
Community Garden	Orto di San Matteo	2015	food production/ leisure	environment protection, cultural heritage	Association of Neighborhood	Private operators and city-dwellers	Inhabitants of the sant'Angelo district	Public
Hybrid Form	Elaia farm	2015	Income integration for farmer / production of fresh products for the participants	self-consumption, leisure, recovery traditions and culture	Public-Private partenship	Umbria Region	Citizens (family, students, individuals)	Private
Hybrid Form	Ortinsieme	2016	social integration	food production	ACLI		Refugies people and family	Ecclesiastic proprerty

A resolution on 6th July 1976 was drawn up to define the direction of the allocation and organisation agreements. The province assigned applicants a lot of 150 m^2 for one year, which was automatically renewed. The institution provided land, water and a tool shed. Retirees, in turn, committed to cultivate the plot, and provide tools, seeds, and other materials. The first funding allowance of 10 million liras covered the building of 30 plots because the investment required to build each lot was approximately 500,000-600,000 liras. Following the high number of applications for the program, the province decided to create more lots in Ponte della Pietra and extend the project to another area, which belonged to the farm of the former Santa Margherita psychiatric hospital that was closed in 1980. Resolution 167 of 4th June 1991 envisaged the enlargement of the program in this area. In the ensuing years, the province created a total of 340 lots, of which 198 are located in Ponte della Pietra.

A further review of Regulation 167 was completed in 2011. Two of the main additions were the compulsory requirement to use organic methods of cultivation and that 5% of the lots should be assigned to individuals with disabilities. The remaining lots were still assigned to retired residents (over 65 years old) of the city of Perugia. The allocations, provided for four years, were raffled off at end of the period if the number of available lots was less than the number of applicants. The managing technicians from the province noted that, in the spring of 2015, 198 lots in Ponte della Pietra were cultivated and

Figure 2: The project n the Elaia Farm (Photo Credit: Chiara Paffarini)

one was assigned to a person with psycho-physical disabilities. In the Santa Margherita area, there were 106 lots, with 5 unoccupied. In total, there were 309 lots, slightly less than the initial 340 lots.

Despite the fact that the goal of the program is unchanged, the profile of the participants has changed over time. Forty years ago, when the program started, participants had previous experience with farming; in fact, most of them were of rural origin. In recent years, the "new generation" of retired people frequently did not have any prior contact with agriculture; the allotment was their first experience. Generally, allotment users only cease cultivation for health reasons or the inability to continue the activities; a lack of interest was rarely cited. The participant profile differs between the two zones. In Ponte della Pietra, participants live in the neighbouring areas and are, for the most part, former factory workers. They belong to a lower-middle income bracket and 34 are women (17% of the total). In this area, conflicts and tensions among users are frequent. Former professors or public employees mostly occupy the Santa Margherita allotment garden. They have an average income and live in the city centre or in the suburbs (such as Ponte San Giovanni or Ponte Felcino). Thirty-three are women (30% of the total). Conflicts between the participants are less frequent at this site, and for three years, the community has planned a party each September.

The program is currently running and is orientated towards retirees with the aim to "keep them in their social environment and encourage employment activities which stimulate participation in collective life" (Article 1 of Resolution 167). The managers of the Province emphasise that the program has a social purpose; however, for the participants, other goals are also important, including the production of food for self-consumption, food security, environmental protection, leisure, and the recovery of traditions and culture (Table 1). During the last 2 years, two hybrid types of allotment gardens (project "AgricityUmbria" and “Ortinsieme”) have emerged that differ from previous projects because they were promoted by public-private partnerships, involving a wide spectrum of actors and responding to different objectives.

The project "AgricityUmbria" was the result of a partnership between nine farms, the Technology Agribusiness Park of Umbria, the association of producers "Impresa Verde", and the Department of Agricultural, Food and Environmental Sciences (DSA3) at the University of Perugia, which acts as coordinator. The project was financed by measure 1.2.4 of the Rural Development Plan of the Umbria Region (2007-2013) regarding "Cooperation for development of new products, processes and technologies in the agriculture and food and forestry sectors". The project aimed to create allotment gardens within nine farms located in peri-urban areas of several Umbrian city centres. The project ran from January 2015 until September 2015. Eight out of the nine farms provided a section of their land for the project, which was divided into lots of variable size and assigned to city-dwellers. In total, 18,000 m^2 of land was involved in the project. The project was promoted as enhancing "rural culture", re-

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spect for the environment, and food culture. In addition, the gardens were designed as a green space for leisure and to connect with the farmers and agriculture. The gardens included two day-care centres, which assumed an important role in terms of social inclusion for young autistic people and the rehabilitation of disabled young people.

Within the project "AgricityUmbria" we investigated the allotment garden realized by the Elaia Farm, located very close to the city centre of Perugia (**Figure 2**). This property has been owned by the Faina family since the late nineteenth century and has always had an agricultural use. The farm provided an area of 3,000 m^2 divided into lots of between 100 and 150 m^2 according to the participants' request. In addition, irrigation water was pumped from a small artificial lake, located near the lots. All the lots were cultivated with organic agriculture. The farmer and the farm workers prepared the soil, built the garden paths, and planted the plants. The tools to cultivate the horticultural plants and the aromatic herbs were available for everyone on the farm. Project funding covered all the costs for work, land, and tools. Therefore, the city-dwellers that decided to manage a plot in the urban garden of Elaia did not face any costs during the AgricityUmbria project lifetime. Twenty-one lots of land were prepared within the farm and 15 families participated in the project. Participants included 12 children/teenagers, one family without children, five retired people (a couple, two single men and one single woman) and one group of three friends.

The objectives of the project differed according to the actors. Farmers diversified their activity in order to achieve an additional income supply. For the city-dwellers (Table 1), the main objective was the self-production of fresh produce and aromatic herbs. Specifically, all the families decided to manage the assigned lot to help their family income, especially those with a single-income. A secondary goal for the families was the educational aspect; horticultural activities represented a way to enjoy the connection with nature, which was particularly important for the children. In fact, these agricultural activities have a strong educational function; they enable the children to understand the origins of the food they eat and help to build and reinforce respect for the environment. City dwellers that cultivated the farm lots established strong, positive relationships, exchanging suggestions and knowledge regarding horticultural practices.

During meetings among the farmers, the project coordinators, and the participants, an important result was found; teenagers improved their initial interest by asking specific questions about horticulture and agriculture, demonstrating an increasing sensitivity to the topic. In 2016, the project continued without any public financial resources. The farmer estimated a cost of 1.20 €/m^2 per year for individuals who wanted to manage the lots. This was expected to cover the cost of rent and irrigation water. For example, 60 € was the annual rental cost for 50 m^2 lot of land. Additionally, 70 to 90 € was required for the water system according to the size of plots. In the summer of 2016, 20 plots were cultivated; of which ten were by city-dwellers that had participated in the AgricityUmbria project in the previous years and continued to manage the urban garden plots at Elaia farm by paying the land and water rental. The other half of the occupants were new people with an interest in the project.

The Christian Association of Italian Workers (ACLI) promoted the second hybrid project, "Ortinsieme", during the summer of 2016. The ALCI association contracted an agronomist to redevelop and valorise an area of 16 ha that they been granted, and had been uncultivated for 15 years. This area, located in a trans-urban area of the city, the Montemorcino hill, was founded by an Olivetan Monastery in 1366 and in the mid-eighteenth century, the structure became a diocesan seminary. The ACLI Association also manages the support office for migrants (Sportello Immigrati), a special service to inform, assist and orient migrant people that want to remain in Italy, in accordance with Italian law (legislative decree 142/2015). The ACLI organizes professional training courses for asylum-seekers (refugees) (e.g. theoretical and practical courses on pruning olive trees, and in the summer of 2016, courses on organic horticulture). The agronomist that conducted the courses received monetary compensation for the preparation of the courses and the coordination of the agricultural work. However, the refugees could not receive a salary; according to the Italian regulations concerning the accreditation status of asylum-seekers, they acquired some accreditations that could be useful to facilitate their applications for acquiring official documents. The refugees involved in this project were six men between the ages of 18 and 26 from Syria and Algeria. They prepared and cultivated 2,000 m^2 of land and arranged 40 plots of 10 m^2 each, with around 70 plants for the autumn-winter seasons (cabbage, fennel, broccoli, and salad). 32 out of the 40 plots were assigned to people or families that paid 60 € per season and, in exchange, they could collect fresh organic food. However, the project coordinator and refugees man-

[1] Borgo Bello is the association of residents and friends in the neighbourhood of Corso Cavour and Borgo XX Giugno. The association offers monthly cultural and social events.

[2] The Umbra Institute was founded in 1999 in Perugia in cooperation with Arcadia University. The centre offers academic programs for higher education for students of American colleges and universities.

aged the transplanting, watering, manual weed control, and organic compost application. The plot renters were mostly families, most of which had children. They were interested in consuming local organic products and supporting this social agriculture project. Plot renters lived close to the project area, particularly in the areas of the Montemorcino and Fontivegge, Case Bruciate, San Marco, and Elce districts. Money received for rent was used to buy the production factors.

The main functions of this project were productive and social, considering that the refugees could acquire some skills, knowledge, and accreditations for their release documents. This project differs from the other because it was coordinated by one part-time and six full-time managers, and the city-dwellers paid for the products that were grown in their plots. They did not receive public economic funding or support, however, the coordinator of the project agreed that the municipality could create connections with other UA initiatives to facilitate the implementation of different short food chains. For the moment, this project has reached its limit considering the number of people and hours invested. Expansion of the project would require a greater investment in man-hours and equipment (e.g. buying a tractor and other tools to cultivate the entire area). The coordinator underlined that this was the first season of cultivation so the "Ortinsieme" could be considered an experiment requiring future improvement based on research.

Two local associations have promoted the community gardens, Ortobello and Orto di San Matteo. The Ortobello community garden was the first community garden established within the city of Perugia. The project was promoted within the Caro Vicolo (Dear Alley) Project started in 2014 by as a collaboration between the Borgo Bello Association[1] and the Umbra Institute[2]. The Umbra Institute hosts American students for short courses on various theoretical and practical issues. In 2014, within the course on sustainable architecture, students had the opportunity to work on urban projects in collaboration with the Borgo Bello Association. They started thinking about the revitalization of the Borgo Bello area and the repurposing of the alleys within the district.

On the 15th of April 2015, after theoretical and practical workshops, the garden was created. Four cultivation bins were constructed from wooden pallets, along with two seating benches. The space was decorated with flowers and pinwheels made from recycled materials. A formal authorization for the use of the space has not been developed or made public yet. While the previous administration granted formal patronage to the initiative and the use of the space, this has not yet been formalized. The dialogue with the new administration, elected in 2014, is ongoing; however, the Municipality department responsible for the garden has been renamed from the department of "Urban Centre" to "Urban Decor".

The participants, including approximately 20 dedicated individuals, meet most Tuesday evenings to work (e.g. planting, maintenance, etc.) and make joint decisions (e.g. regarding which plants to plant, how to organize the garden, and the organization of events for promoting educational and recreational activities, etc.). In the garden, there is a showcase and inside there is a notebook where the participants can indicate a schedule for watering to avoid overlap or long periods of drought. To better understand the collective perception regarding the goals of the project, 10 participants were interviewed together. According to the opinions of the group, the main purpose of the garden is the redevelopment of urban space and an emphasis is given to social activities, including education and recreation as well as environmental protection.

The participants of the Ortobello community garden imagine that the garden itself could expand into the private adjacent space, and they are discussing the creation of an agreement for the free use of a neighbouring area with the owner. They also aspire to create a diffusion of several community gardens spreading through the entire neighbourhood and the city, as is the case in Todmorden, England. The group considered the municipal administration as the main interlocutor that must support these initiatives. The participants of the Ortobello community garden are in contact with the DSA3 of the University of Perugia for garden management within the Faculty of Agriculture. This idea arose from the desire by the DSA3 to reactivate the students' gardens, which were more or less abandoned after 2012. In June 2015, they established five plots of four m^2 each that could be cultivated by members of the association with the students of the Faculty of Agriculture. The main goal of the garden is social integration among students and residents of Borgo Bello, the location of the faculty. This collaboration emerged from a dual motivation; to ensure the maintenance of the vegetable garden during the summer, when students are normally absent, and to create a space for integration and social cohesion between the students and city-dwellers. At present, this initiative does not have specific funding.

[3] OrtiUrbani project was promoted by the Italia Nostra Association in agreement with the Italian National Association of Municipalities and the Ministry of Agriculture, Food and Forestry and undertaken by Coldiretti and Campagna Amica Foundation. The campaign is oriented towards public bodies and private operators that own a land and they want to cultivate out of respect for the historical memory of the place and ethical rules established by Italia Nostra.

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Figure 3: The project of Therapeutical garden in Santa Margherita Park (Photo Credit: Giulia Giacchè)

The San Matteo Garden is located in the district of Sant'Angelo within the San Matteo degli Armeni complex. The monastic complex became a suburban residence of the Oddi family in 1632, then returned to the possession of the Cathedral in 1820. In the 1960s the site was purchased by the Company of Perugia Tourism as a location for the regional ethnographic museum. The Association "Vivi il Borgo", who promoted this project, commenced looking for a site on which to create their community garden in 2013. Discussions were held with the municipality regarding an area of 7000 m^2 within the San Matteo Armeni complex, and the garden was inaugurated in November 2015. The municipality, within the framework of the OrtiUrbani[3] project, supported this initiative. The Association signed an agreement granting the use of the space and defined rules for the organisation and management the garden. The main objectives of this garden are food production and social integration.

The municipality provided the excavation and arrangement of the fieldwork, and two agronomists assisted the community to define a common project and plan the plantations. In November 2015, during the inauguration of the garden, five plots were created; a single large collective plot and four smaller individual plots for elderly people that wanted to cultivate their own plots. Onions and fava beans donated by a Garden Centre were planted. During the wintertime, from January to March 2016, the two agronomists organised theoretical courses to provide some information and knowledge regarding organic methods of cultivation, and planting and organisation commenced in the spring. The group was composed of 15 people, mainly women, from 30 to over 60 years old. They usually met at the garden on Thursday or during the weekend to share the produce, and to prepare a dinner organised by the association. All the participants lived in the neighbourhood.

Another project is the synergistic garden located in the Santa Margherita Park (**Figure 3**). The garden is therapeutic and maintained by the "Nuova Dimensione" (New Dimension) social cooperative. The cooperative runs a day care centre, the Casa Famiglia Taralla (Family Home Taralla) for people with mental health problems. During the morning, two social workers conduct activities in the garden involving seven guests of various ages. The project was created in 2012 thanks to the enthusiasm of a social worker who attended a two-year course on hortotherapy at the Hortotherapy School of Monza from 2010. After the course, the individual proposed to the cooperative that they create a synergistic garden within their centre. The local health unit has allowed him to carry on this project by investing his time into it. Over the last 3 years, the project has expanded to occupy a total of 7,000 m^2, comprised of two big lots.

The main goal of this project (**Table 1**) is therapy; however, other goals are also considered important such as education, social aspects, protection of the environment, and cultural preservation, considering the strong ties sought with local food traditions. Commercial pro-

duction and food security are less important goals. The social worker emphasized that one of the objectives that the program has achieved is working integration. The social operator involved the more able and interested people in the maintenance work of other areas, such as the "Giardino dei Semplici" in Assisi. The Assisi Nature Council Association covered the cost of the garden's maintenance, which was performed by the New Dimension Cooperative. The social worker proposed the creation of a synergic vegetable garden to the Italian Environment Fund (FAI). Over the course of few months during 2014-2015, the social worker and three guests of the day-care centre worked on the garden project (from the ideation to the realisation). The garden opened on 7th June 2015 with the objectives of education and creating aesthetic values. The Assisi Nature Council Association financed this project.

These experiences show that gardening can create real job opportunities for people who are likely to have difficulty finding employment in the job market otherwise. The social worker points out that there is enormous potential for growth development and diversification, focusing on the supply of services (such as plant production, seed breeding, transplanting, and creating a flower nursery, etc.). He also suggests that they could extend the cultivated area considering the large space available within the Santa Margherita Park where they are located. For the moment, however, the project has reached its limit considering the number of people and hours invested. Expansion of the project would require a greater investment in in man-hours, infrastructure and equipment (e.g. to restore an old building that could be used as a shed for tools and the purchase of the latter).

The educational garden promoted by the Department of Agriculture, Food and Environment (DSA3) of the University of Perugia is located within the complex of San Pietro, the headquarters of the Agriculture Faculty, owned since 1892 by the Benedictines. In the '60 new buildings have occupied the eastern area of the complex, which was previously used as agricultural land, and the botanical garden was relocated to a larger plot close to the Faculty. The garden was re-created in this area to reactivate the students' gardens and to promote integration between the students and the inhabitants of the Borgo XX Giugno district where it is located. Each semester, approximately 50 students attend to the practical activities, while there are about 20 people belonging to the Association Borgo Bello that have participated also. At the commencement of the garden, in the summer of 2015, a collective plot and some bins of approximately two m^2 each were created. The predominant crops were vegetables; however, a section of the collective plot was devoted to the cultivation of flowers, to be used for the infiorata of the neighbourhood, and to a small orchard. The Department signed a convention with the Association to facilitate access and the participation of the members. Currently, a larger area is cultivated courtesy of the rehabilitation work conducted by a group of technicians and professors of DSA3 who founded the "Green Team". During the spring and summer of 2016 they cultivated beans, peas, and potatoes, used in the kitchen of the DSA3 café. They also created 16 bins of 1.2 m x 1.2 m using recycled material. The bins are used to cultivate vegetables and for educational activities during student visits. The total cultivated area is now approximately 650 m^2. The DSA3 would like to cultivate the entire area, and to revive several greenhouses that are currently in a state of decay, for producing seeds.

Usually the activities (organisation, cleaning, seeding, and transplanting) in the garden are carried out twice weekly by the "Green Team", which includes students and members of Borgo Bello Association. Guided tours are organised for schools and an annual course has been designed in conjunction with the school of Borgo XX Giugno to enhance the creation of a linkage between the garden and the classroom. They also organise social gatherings. The desire of the project coordinators is that the garden becomes an "urban hub" that may work as a network for various UA initiatives.

Discussion

The objectives of this study were to understand the diversity of stakeholders involved in UA and describe the new socio-spatial configuration into which these experiences have been implemented. We also hoped to indicate orientations and suggestions to enhance the impacts of UA within the city, based on the social and environmental capital developed. All these initiatives or projects, with the exception of the Ortobello community garden, are located in areas that have been recently invested, or have always been invested, in agriculture. Thus the main differences over time concerns the actors and their motivations.

The people interested or involved in UA initiatives in Perugia varied. Concerning the promoters of the initiatives, we found that both private (e.g. farmers, city-dwellers) and public (e.g. province and university) actors were involved, and that the majority of the initiatives were promoted by public-private partnerships. Previous landowners were primarily monastic orders or noble families, while currently, landowners are both private (e.g. farmers, diocese) and public (e.g. province, municipality, university). We also remark that the majority of the initiatives have been carried out or coordinated by agronomists, or people working at the DSA3. This indicates

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that the DSA3 and agronomists have been recognised as useful in the implementation of UA projects due to their skills and competency in the agronomic field. Their involvement also suggests that production aspects and techniques are important to guarantee efficient projects. Users are a heterogeneous group composed of the elderly, families, students, refugees, people with disabilities, and young people. They differ in their age, sex, education, nationality, and motivations.

Past motivations for UA were subsistence and production. Currently, the motivations vary as there are a range of direct and indirect impacts on the people involved. We estimate that for the approximately 350 families involved in the Elaia and Ortinsieme gardens, these projects have provided consistent direct (i.e. production) and indirect (i.e. saving on food purchases) economic benefits. Furthermore, an additional 30 people contributed to the community gardens and some students participated in the educational garden that received some fresh herbs or seasonal vegetables for their food supply. During the survey period, at least seven people were paid to promote or coordinate UA projects, though not continuously, and a further five people accompanied and implemented these projects as unpaid volunteers. Furthermore, for some disadvantaged people (seven people with disabilities and six refugees) the participation in these projects was an opportunity for labour inclusion and to benefit from green care activities.

Our analysis shows that the allotment gardens and the hybrid typologies, despite having been created to respond to a social need (i.e. social integration of retired people or "employment" for refugees), have an important role in terms of the production of fresh food for sale or own consumption. These and other similar projects could become useful tools to help vulnerable people or those in financial difficulty to produce their own fresh and local products. Therefore, specific programs can be implemented as a strategy to improve territorial and local food production. The two community gardens aimed to defend common goods (e.g. public space and historical and cultural heritage), and they are an expression of the citizens' desire to re-appropriate space, a sense of community, and to understand the origin and methods of food production. Therefore, a community garden could be one of the common devices implemented to improve social cohesion and urban security. In particular, this tool could be implemented and encouraged in the central areas of the city where there is a lack of green and open space, to avoid spatial and social degradation.

The educational and therapeutic garden presented diversification strategies that affected the production of social and educational services. The partnership between the educational garden and the Ortobello community garden emphasizes the idea of an experiential strategy; the garden is identified as an urban oasis where the gardeners can meet, socialize, and relax. Therapeutic gardens could be used as a tool to activate integration and create job opportunities for people with disabilities within social policies.

However, as has been highlighted in the case studies analysed, this initiative should consider that the most successful UA initiatives tend to be those with a bottom-up approach that respond user requests, whether they are citizens or associations. This survey demonstrated that a social demand for the reintegration of agriculture within the urban area is increasing. At the same time, there is a lack of linkages between the different initiatives. In order to enhance the network between actors, a Festival of Urban Agriculture could be organised, following those that occur in French (e.g. Paris, Nantes, Strasbourg, Lille, Toulouse) or Brazilian (Sao Paulo) cities. Events such as a festival could enhance the connections between the stakeholders (Torquati et al., 2014) at local, national, and international scales.

The number of people involved in UA initiatives is still very small. Through the dissemination of these projects, a larger number of people could be involved in provisioning more spaces and resources. UA delivered new resources in terms of cultivated areas, forms of organisation (e.g. public-private partnership), relationships (e.g. inhabitants and farmers, inhabitants and immigrants), knowledge, and empowerment. Furthermore, these UA experiences are expressions of the prevailing environmental values, including the protection of nature, the quest for a better quality of life, or the consumption of local and organic products.

Conclusion

UA is a flexible and multifaceted tool that connects and integrates different policy programmes (e.g. those involving food, education, education, and therapy). Based on our findings, two paths are possible: (1) the integration and implementation of tools and programs promoted UA into other sectoral policies, and (2) the creation and the implementation of a specific policy on UA.

In the first case, it would be necessary to re-evaluate programs and policies, and conduct a review of the expenditure items. Economic resources could be found by re-thinking how the public spending is assigned. For example, the resources allocated to refugees and immigrants. Centres that host immigrants receive financial

resources for each guest to ensure a monthly room and board. A proportion of these resources could be used to activate UA projects involving all the people interested in cultivating their own food, and learning horticulture or fruit growing techniques. Furthermore, the implementation of these projects in public areas could result in cost savings for the municipality, because they will not be responsible for their maintenance activities. These savings could be directed towards co-management areas among municipalities, associations, schools, and city-dwellers.

In the second scenario, it is possible to imagine the creation of a specific cross-cutting policy that would launch UA experiences and initiatives. To make these initiatives effective, the municipality should include them in a specific program of urban and peri-urban agriculture. That program should be transversal to different sectors and public services, recognising the multi-functionality and versatility of the UA projects already underway.

Through both the establishment of appropriate instruments and the provision of space, the Municipality could facilitate the creation of cultivated areas in trans-, intra-, and peri-urban areas. As our results have demonstrated, technical support and effective management of these areas is required. Concerning the spaces, the Municipality of Perugia identified 12 public areas that will be awarded to those who request them. This municipal initiative is based on regional law 3/2014 of the Umbria Region, which promotes the designation of urban and peri-urban public areas for cultivation, favouring people who want to produce organically for their own self-consumption. In addition to public areas, private areas that currently have other designations, or are abandoned, could also be used to grow food. Institutions should develop a map of public land that could be made publicly available and which could be linked with information regarding unused private spaces through an online platform. There are many examples of contractual arrangements (Pierri & Torquati, 2016), including public-public, public-private, and private-private partnerships, to coordinate the use of space. Allowing access to the land is a second step that could facilitate the implementation of simple devices and tools to accompany the actors to implement and realize UA projects and initiatives. As demonstrated at the site of GrowNYC, originally created in 1970 as the Council on the Environment of New York City (CENYC), the municipality of New York Cities has activated some programs and simple procedures to link the city-dwellers with green markets, recycling, community gardens, and environmental education.

The city should improve the spatial and functional integration of professional agriculture. Authorities should collaborate with urban producers with the aims of managing waste recycling, building a community among the citizens, and creating sustainable food systems. As pointed out by Van Veenhuizen (2006), if well-managed, urban horticulture can play a significant role in reducing socio-economic and environmental problems in cities and metropolitan areas. Furthermore, this approach should be gradual in terms of awareness raising, training, involvement, and of adhesion to the themes of UA. At the same time, bottom-up initiatives are fundamental considering their importance in terms of social and technical innovation. In this way, the France National Association of Urban Professional Farmers has been established to re-evaluate the status of professional farmer required legal adjustments and to identify business models that could be suitable and specific to the urban context.

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Conflict of Interests

The authors hereby declare that there are no conflicts of interests.

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