

Department of Political Science and International Relations

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Urban Agriculture in Europe: State of Play and Future Perspectives

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Introduction – A good introduction to a master thesis should contain the broader research question that oriented the student during its investigation and the specific viewpoint from which she decided to act. Moreover, those information should be coupled with the reasons that stimulated the author’s interest in the subject matter, which, in turn, should be backed by reliable data showing its real weight in everyday life, since the ultimate goal of every scientific research is to increase our well-being.

Therefore, I would like to briefly describe why I am interested in the state of play and future perspectives of urban agriculture in today’s Europe. Then, I will better clarify the demands that led my investigation and I will summarize how I proceeded in elaborating them.

Almost one year and a half ago, I discovered new urban places where I felt right at home. They were extra-ordinary gardens, designed by people having in mind a different way of living the city. They were open to everyone and devoted to the production of fresh and healthy food. Such activity, however, was often conceived as a tool and not a goal. The importance, there, was to build up again a sense of community, sharing knowledge and competencies on food production, healthy eating and sustainable urban lifestyles. The people I met liked to define themselves as little “seeds” of change for their own city. At that time I thought that urban agriculture is at least an interesting social experiment, so I chose to commit myself to further investigating the nature and features of what was presented to me as a “silent revolution”.

Merging my curiosity with the university studies, I elaborated the following research questions: is the (re)localization of the food production at the city level a suitable and desirable solution for the promotion of resilient and sustainable food systems? And, in turn, could a city engaged with food production be considered more sustainable and resilient to change?

Therefore, the aim of this dissertation is to investigate an engagement with food production at more localized levels. In particular, the specific focus is on the role of urban agriculture as adaptation strategy in Europe’s cities.

Figure 1 - Abandoned public green space, Rome, V Municipality



Figure 2 - Same area after the realization of the urban garden *Orto di Aguzzano*



Main point of departure is, on the one hand, the world's urbanization prospects and, on the other hand, the current dynamics of food production and consumption and their impact on the ecological footprint of a country and its cities.

Historically, cities have been places of opportunities coupled with higher level of employment, benefits due to scale economies, and improved living standards. Since the industrial revolution, urbanization started and the cities have gradually increased their size and population. The UN Department of Economic and Social Affairs estimates every two years the major trends and challenges of the phenomenon. According to the 2014 report, at present, more people are living in urban areas than in rural ones, with 54% of the world's population residing in cities. The fact is projected to be 66% by 2050. Europe is listed among the most urbanized regions of the world (73%). To understand why it is urgent to act right now, it should be bore in mind the very recent evolution of such trend. The world's urban population was 746 million in 1950, it is currently 3.9 billion, and it is expected to be 6.4 billion by 2050. In contrast, rural population is now close to 3.4 billion and it is expected to decline to 3.2 billion by 2050.

Despite the fact that today's cities occupy only 3% of the earth's lands, they consume most of the world's energy and materials and are responsible for 3/4 of the overall GHG emissions (TAYLOR, 2012). The world's ecological footprint provides comprehensive data on humanity's demand on natural resources. According to the Global Footprint Network (GFN), we are using more resources than the ones the Earth can provide, and namely we use the equivalent of 1.5 planets to produce what we need and to absorb our waste and the situation will evolve in the future according to the population and consumption trends.

As far as Europe is concerned slightly more than half of its total land area is bio-productive, with an average availability per person of 2.9 gha. However, the typical European resident has an ecological footprint of consumption of 4.7 gha! Also on the production side, Europe is far beyond its limits since its ecological footprint for production is 1,038 million gha higher than its bio-capacity. To sum up, it could be said that the majority of countries in Europe produce and consume much more than their

possibilities. And the agricultural sector occupies an important share of the overall consumption of resources.

Therefore, in the next sections, the (re)localization of the food system at the city level - via the adoption of urban agriculture - will be investigated.

Section 1 – This section analyzes the relationship existing between the food system and the urban context. It aims at framing the issue that will be further developed in Section 2 and 3: the suitability of the (re)localization of the food production at the city level (Is it desirable? Is it feasible?). In particular, this thesis investigates the role of urban agriculture in promoting resilient food systems in Europe. To do so, first of all, the complexity of our agro-food system is described according to a territorial approach. The food system is defined as the set of the interdependent elements that work together towards the end of satisfying food needs of a given population in a given space and time (Malassis, 1979). Its complexity is due to the geographical location of its components, the flow of goods and the relationships between the actors involved. The general conclusion is that it is a dynamic process, which generates ever-changing food geographies. Three existing and overlapping “foodscapes” are studied, and namely the global agro-food system (GAS in short), which is analyzed since a significant share of the food consumed in today’s Europe is made of imported products; the metropolitan agro-food system (MAS), which refers to the capability of the agricultural land surrounding a city or a cluster of cities to satisfy all or part of the food needs of the population and, finally, the local agro-food system (LAS), which is strictly associated with the products grown, produced and processed in the locality in which they are marketed. Such systems are described since they shape, at different percentages, the existing food geography.

Therefore, the second part of Section 1 investigates the motivation behind a possible shift towards a predominantly local food geography, according to a philosophical approach. The active role of the city and its inhabitants in the protection of our planet is endorsed starting from the assumption that, on the one hand, nowadays most of the urban dwellers ignore where their food comes from, how it is produced and where and how their food waste will be processed, still, on the other hand, the claim for a more sustainable food and farming system is increasing. For sustainable food is

meant a healthy, green, fair and affordable food. *Healthy* is defined as the “food that is nutritious and readily available; food that over time won’t lead to heart disease, diabetes or other chronic diet-related problems”. *Green* is the “food produced in an environmentally sustainable manner, but not necessarily organic”. *Fair* means that “all who are involved in the food system from production to the point of purchase receive fair wages and have safe working conditions. And *affordable* refers to the condition in which “people have the means to purchase it” (WINNE, 2010). In other words, it is possible to say that the process of food production and distribution should care not purely for profit but also for social and environmental concerns.

So, the third part of Section 1 reorders some conceptual ideas useful to frame the issue. And namely the notions of *green infrastructure*, *ecological urbanism* and *urban resilience* are introduced so as to provide a theoretical framework of reference.

The fourth and last part of the section deals with the territorial unit of analysis selected for this research thesis, and namely the entire Europe. It is devoted to showcasing its land context and food culture. As far as the former is concerned, the European territory and land context appears extremely variegated and the region presents diverse challenges according to the latitude and longitude taken into account. Among the policy recommendations elaborated by the European institutions (collected into one report titled *Sustainable food consumption and production in a resource-constrained world*, written by the European Commission’s Standing Committee on Agricultural Research – SCAR, in short), one is here reported: i.e. that the integration of agriculture in the urban setting is necessarily linked to the urban-rural nexus, therefore to the mainstream agricultural system. In particular, in our continent the following suggestion should be endorsed, for the continent overall well-being:

[Since] in Europe, the Atlantic biogeographical region has the highest pressure on agricultural land and includes some of the most intensively farmed areas on the continent (EEA, 2010), maintaining high-nature-value (HNV) farmland in the Mediterranean area and the Iberian Peninsula, central and eastern Europe, together with Scotland and Western Ireland, is clearly a priority (Cooper et al., 2009).

In the context of developing a ‘sustainable-competitive’ model of European agriculture that would provide Europe with a technical and marketing advantage, Purvis et al. (2011) stress the significance of local and regional food production as a critical element. They state that “in any system that is

fundamentally reliant on natural processes, sustainability is strongly dependent on the local environment, and a strong emphasis on 'place and culture' is needed. Thus, in designing new systems of food production, particular attention needs to be given to the central importance of, and the advantages provided by the local environment [...]" (SCAR, 2011: 99)

As far as the food culture is concerned, the European Commission (2007) has identified a common pattern of food consumption among the Europeans, which is characterized by three general trends: first, nowadays there is an *enlargement in the variety of food consumed* due to the development of the international food trade as well as of the social and technological innovations over the past two decades; second, there is a *change in food habits* since today's consumers spend less time at home and are confronted with an increasing availability of pre-cooked meals and/or new domestic appliances for storing and cooking; and third, the *divergence in diet between the rich and the poor* is steadily increasing. In conclusion, it is possible to affirm that there is a common challenge at the continental level, i.e. finding spaces for sustainable food production within the urban boundaries.

Section 2 – Section 2 provides, first of all, a general definition of urban agriculture.

Urban agriculture [in short UA] is an industry located within, or in the fringe of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area (MOUGEOT, 2005).

This description allows the reader to take into account the most important features of the phenomenon: firstly, UA is defined as an industry meaning that it is thought as a legitimate component of the overall system of food production, a valid alternative to the currently mainstream food industry (associated with rural areas and long transportation chains). Indeed, a special attention is devoted to the importance attributed by local farmers to the orientation-to-profit: at the European level, economically viable urban agriculture is practiced along a continuum line, ranging from, on the one side, urban farms systematically profit-oriented, and, on the other side, activities conceiving it as a secondary goal. Secondly, it is worthy to mention that, in every case, the stress is always on the local dimension: human and material resources, products and services come from the territory and aim at feeding local

population. Urban agriculture can be truly considered as a farming technique ascribed to the Local Agro-food system (LAS), as described in the previous section. And thirdly, UA is conceived as multi-functional: indeed, food production is often and intentionally coupled with recreational and educational activities. The reference is to the possibility of producing food as well as non-food products. According to numerous researchers, the main functions attributed to urban agriculture behind food production are: 1) prevention or absorption of environmental risks, 2) contribution to cleaning up the city by recycling waste, 3) landscape and socio-educational functions, 4) contribution to urban employment and 5) reduction of inequalities.

The second part of Section 2 analyzes further in details the technical *sine qua non* conditions that allows the implementation of urban agricultural projects. Urban areas to grow food and not-food products can be planned and designed in different forms, according to the size and features of the selected site. Nevertheless, each project faces a set of specific challenges related to the following factors: availability of the land, soil (or equivalent) requirements, access to water, lighting or solar exposure, potential contamination, legal status and related commercial regulations, land access and security concerns.

Concerning the soil, the most commonly proposed solutions are: to cultivate directly on available urban lands; to set-up soil installations in not-arable urban spaces and to utilize innovative soilless techniques of vegetable production (hydroponics or aquaponics). Today's novelty and UA's strength is constituted by the great variety of elements and materials allowing the cultivation in not-directly-arable urban spaces.

Integrating agriculture in the urban context means being concerned about the exposure to sunlight, for the very basic need of solar energy that crops have during their photosynthesis process. So the productive capacity of cities requires an analysis of the lighting conditions of man-made surfaces. In particular, it is necessary to deal with orientation and overshadowing of existing building blocks. This implies the collection of height and shadow information.

Crops production normally needs high water requirements. Also, the quality of water is critical, since water-borne pathogens on crops eaten uncooked cause diseases.

Water requirements can be met through alternative channels, such as: *wastewater* from domestic sources, which can be re-used, if properly treated; *rain water*, harvested from roofs, which is low-cost, less polluted than other urban sources and, if constantly harvested, helps mitigating urban flooding and soil erosion. In addition, water utilization could be optimized adopting water efficiency practices and using appropriate irrigation technologies.

Urban pollutants threaten the quality of food grown in metropolitan settings and rise concern about UA's usefulness and sustainability. They contaminate natural elements with which plants are in direct contact and pose at risk human health, since humans eating polluted plants directly absorb the harmful contaminants therein enclosed. Here-hence the importance of being aware of the matter and well informed about the existing remedies and their effectiveness.

Finally, a third part of the section classifies existing European projects according to their location within the urban environment in order to present the multiple ways in which UA is realized in our continent today (see Table below).

Location	Selected case study	Open Space / Building-integrated	Ground level/ Rooftop	Property rights	Implementation	Orientation
Demolished sport fields	Orti Dipinti, Florence	Open space	Ground level	Public area	Since Sep. 2013	Socially-oriented
University campuses	LUISS University, Rome	Open space	Ground level	Private area	Since Nov. 2014	Educational
Urban farms	Cooperatief Eigenwijzer, The Hague	Both	Both	Private area	Since 2008	Profit-oriented
Rooftop gardens	Potage-Toit, Bruxelles	Building-integrated	Rooftop	Public area	Since 2012	Profit-oriented
Rooftop greenhouses	Rooftop Greenhouse Lab, Barcelona	Building-integrated	Rooftop	Private area	Ongoing	Experimental
Multi-level eco-buildings	Skyland project	Building-integrated	--	--	Not implemented	Profit-oriented
House balconies	Gezonde Gronden The Hague	Building-integrated	--	Private areas	Since 2006	Socially-oriented

Section 3 – This section focuses on the human requirement needed for urban agriculture to thrive. First, it explains why it is not only a site-specific but also a society-specific phenomenon, affirming that the existence of stakeholders with different sets of values and ambitions counts far beyond the availability of land, its environmental conditions and cultivation techniques. In other words, it investigates the why and who questions of urban agriculture (Why do people engage in UA? Who does it the most?).

As far as the “why” dimension is concerned, it is explored by tracing the history of the phenomenon back from the origins up to its current re-emergence. The 20th century is indeed a period of decline for urban agriculture. With the exception of periods of national emergencies, during the last 100 years, food growing and green spaces in cities have become increasingly less productive and more symbolic in nature. As a consequence, today’s urban open spaces appear sterile food-free environments, such as turfed parks, paved streets, vacant lands, industrial zones and waste disposal areas. However, this disconnection between the city and its food starts to be challenged: in this context, special attention is devoted to the analysis of two social movements present today at the European level: the urban food planning movement and the local food movement.

As far as the “who” dimension is concerned, it is investigated describing the profile of the main agents involved in urban food production. They are grouped into the three categories: first, the urban farmer, i.e. the supplier of locally grown foodstuffs; second, the urban dweller i.e. the direct beneficiary of those goods, composing the demand side of the phenomenon; and third, the public sector (governments and local authorities), which plays an important role since it could promote (or hinder) urban food production through the (non) adoption of specific public policies.

There is not one single profile of the urban farmer at the European level. The history of urban agriculture and the reasons behind its current re-emergence can help identifying certain motivational values largely shared by different typologies of European urban farmers. According to the data collected, at least three profiles emerge. And namely, the young educated urban farmer; the expert, and the guerrilla gardener.

“Consumers” of urban agriculture are important stakeholders. They constitute the demand side of the phenomenon. Since our definition of UA is that of an industry producing food and not food stuffs, it follows that the social acceptance of and the demand for such goods by the urban communities are essential indicators of the success of this industry. For consumer is meant the direct beneficiary of urban agriculture. Its involvement can range from sporadic/constant participation in gardening activities expressly organized for him and/or the purchase of the urban agricultural produce (mere consumer) up to higher forms of more structured collaboration, known as Community Supported Agriculture, CSA in short (the engaged consumer).

The public sector plays an important role in promoting resilient urban food systems. Urban agriculture starts to be mentioned in policy recommendations and agendas. The most relevant initiatives in the field concern the constitution of City Food Councils and/or City Food Strategies and Charters. The added value of an institutional top-down approach to urban agriculture is the possibility that public authorities have of framing the issue, i.e. identifying all the diverse policy instruments to deal with it, brokering relationships between stakeholders and across governance structures and leveraging existing resources.

Section 4 – Even if the territorial coverage/unit of analysis of this thesis is the entire Europe, nevertheless the phenomenon of urban agriculture appeared to be manifold and great differences emerged between and within European countries and regions. Therefore, before drawing a conclusion on the state of play and future perspectives of urban agriculture in Europe, it is worthy to center in on a specific case-study. The city of Rome has been selected since the author had the chance of entering in contact with the local reality through in-persons interviews with roman gardeners, on-site visits to a random sample of gardens and plots, and thanks to the support received by local authorities, in particular by the Department of Environmental Protection, Urban gardens office, Rome.

Therefore, section 4 deals with the agro-food system of the city of Rome, investigating whether it makes room for urban agriculture. First of all, Rome is framed within the broader Mediterranean context to which it belongs. Second, the influence

exerted by the Italian planning system on agriculture and landscape is taken into account. And third, the peculiarity of the Roman land contexts, as well as the recent trends on food production and consumption within the capitol city are showcased, in order to outline the state of play of urban agriculture and its possible future developments.

What finally emerged is that the status of urban agriculture in Rome is far from efficient. The city has a strong agricultural tradition, rooted in its ancient relationship with the countryside. Therefore, there is an important number of urban farms led by families and cooperatives, which are established both within the city and in its surroundings, and which constitute the backbone of the local food supply chain. However, considered the city's extension (1.825 km²) and the relatively high number of protected green areas, which remain wild and unproductive, due to a voluntary political choice, it could be stated that Rome still has an untapped potential to be explored.

Moreover, the weak role of the public institutions and authorities in managing the urban green spaces led to the development of a young bottom-up movement of urban gardeners. They promote the growing of edible and not-edible plants within the city with the explicit aim of requalifying decayed areas and promoting sustainable urban habits among their inhabitants. Yet, this movement is not always coordinated and it has been legitimized solely in very recent times (November 2014). Therefore, its growth is uncertain and it is too early to forecast possible future scenarios.

Concluding remarks – The aim of this dissertation was to investigate an engagement with food production at more localized levels. In particular, the specific focus was on the role of urban agriculture as adaptation strategy in Europe's cities.

As first general conclusion, it is possible to state that the local is a suitable and desirable spatial unit for food production, for the sake of both the overall agro-food system and the city's context. It is suitable because it is an economically and ecologically sound option and, therefore, desirable because it increases the urban resilience and sustainability, as demonstrated in Section 1.

Still, certain limits to the agricultural productive capacity of today's cities emerge. They concern the volume of produce that the urban environment is able to supply, which, at present, appears to be insufficient to feed the urban population (KEEFFE, 2014). Given the current dynamics of food production and consumption and their impact on the ecological footprint of a country and its cities (see Introduction), it is possible to state that the food system is complex and hard to change. Urban agriculture is a valid option, economically and ecologically, since it could produce a certain amount of healthy affordable green and just food. Still, it cannot solve the food issue alone. It should be included as part of a broader intervention aiming at reducing the human impact on natural resources through the adoption of a broad range of complementary strategies such as the reduction of meat consumption, the promotion of renewable energies, the reduction of waste flows, to name but a few (KEEFFE, 2014).

It follows that the other spatial dimensions of our foodscape (the regional, national and global ones) should receive appropriate consideration too. The general concentration of resources and power into a limited number of multi-national corporations that stand for an agro-industrial model of food production can be counteracted promoting more sustainable and inclusive strategies at all levels, such as, for instance, the corporate social responsibility model or multi-stakeholders policy platforms (SCAR, 2011). Consequently, a possible future scenario for the sustainable development of our planet and our metropolises, as far as the food system is concerned, is the one favoring, on the one hand, the predominance of the local scale, while including, on the other hand, a better governance and regulation of the trade system. Indeed, recent studies demonstrate that despite the realization of the maximum regional food self-sufficiency, given the globalizing trend of production and consumption, the future food geographies will unavoidably deal with global trade and businesses (SCAR, 2011).

The predominance of the local scale can be pursued via urban agriculture. Practically, today's cities in Europe can truly integrate UA into their food policies. Concerning the fundamental conditions to do it, the findings of this research prove what follows:

- First, at present, *there is a satisfying level of scientific knowledge* about the design, installation and maintenance of an urban garden/farm in Europe; or, alternatively, the access to such information (scientific literature, best practices, etc.) is favored by IC technologies, nowadays widely spread among Europeans.
- Second, *an element of divergence* in Europe is constituted by *the level of technological innovation applied to food production at the city level* (high vs. low tech farming systems): if high tech solutions are adopted, higher sustainability is obtained. For instance, the use of a drip-irrigation system fueled by photovoltaic panels which distributes harvested rainwater (Potage-Toit project, Brussels) vs. the use of public water sourced by a drinking fountain (Orto di Aguzzano, Rome).
- Third, *there is a weak still promising level of human involvement in urban agriculture*. Weak since it is far from being mainstream and several gardeners interviewed said their main source of concern was the lack of “manpower” needed to carry on the project, especially in case of no-profit activities. Promising since new profiles of individuals interested in UA are emerging: the young highly educated generation and the expert professional men with a background extraneous to agriculture, yet strongly moved by environmental and social concerns.
- Fourth, *the role of the public institutions is different according to the European country* and its civic culture. However, it can be generalized that in Northern Europe local authorities are more pro-active and aware of the potential of UA (indeed, the city of Bristol signed the first Food Council in 2011; in The Netherlands the food issue emerged in the political agendas as early as 2007; the French ministry of agriculture committed a report to the International Urban Food Network (IUFN) on the “city-region food systems” to investigate the possibility of adopting a regional plan in the Parisian Great Region; whereas Rome or Barcelona still considered UA as a mainly social and educational activity and their engagement with food policy is limited to the recognition and legalization of public open spaces devoted to gardening). Yet, even in Northern Europe, the institutional approach is often criticized or ignored by the citizens. (Bristol’s first reviewing report denounced a gap between what the officials said on projects/initiatives they promoted and what citizens understood about them) revealing *a rather spontaneous transversal bottom-up nature of agriculture practiced in the cities all over Europe*.

- Fifth, one factor making the difference is *the financial support* offered by local institutions especially at the early stages of a project (e.g. Brussels' municipality subsidized the Potage-Toit project with 15.000 euro/year whereas Rome keeps the city's green areas in a state of abandonment).

Accordingly, the today's re-emergence of urban agriculture in Europe seems to be a relatively young trend. It has just received a certain attention by citizens and public authorities, it appears to be led by a bottom-up heterogeneous group of actors (hard to define as a movement), and it lacks of a comprehensive conceptualization. Hence, its ambiguous role as adaptation strategy at the city level: there is not a uniform understanding of the way in which UA should be integrated with the other urban policies. A main cleavage emerged between profit-oriented urban agriculture (economic impact prized first) and social recreational and educational urban gardening activities (social-environmental benefits prized first).

In conclusion, it is possible to identify the following perspectives:

- Given that the majority of the European projects today are experimental or in early stages, their future development should be monitored
- Given the lack of reliable and comprehensive data about UA in Europe, further research should aim at devising a specific method of analysis in order to systematically determine the city's potential for UA. For that approach to be comprehensive, it should integrate the various disciplines related to the study of the urban area
- Joint efforts by public authorities (municipalities, governments) and research organizations could capitalize past experiences and exchange best practices
- The spread of innovation technologies on urban food production could ease the integration of agriculture in the city – facilitating, for instance, the retrofitting of existing buildings or the re-purpose of old infrastructures
- The spread of information and communication technologies (and especially the social networks) could facilitate the exchange of information and generate a greater involvement of the citizens in UA activities.

Finally, the way towards more sustainable and resilient urban food systems is paved across several European cities. Hence, today's Europe should only walk through it, bravely and right now.