

Hortas Urbanas

Contributo para a sustentabilidade da cidade

Extended Abstract

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Abstract

Sustainability is a topic that has been raising concern throughout the time, mainly in the cities, that are the major source of problems. It is increasingly important to be aware of this topic, in order to provide the ability of future generations to meet their own needs.

This essay aims to contribute for the prominence of the importance that urban gardens can play to reach more sustainable cities and thus helping to fulfil the achievements proposed by the United Nations (UN), highlighting the role that architects can have to achieve these goals.

Firstly, the concepts of *sustainable development* and *urban gardens* were synthesized to allow a better understanding of the main topic. The practical component is supported by the analysis of case studies. Interviews were conducted with different farmers from distinct horticultural gardens of the city of Lisbon, making it possible to evaluate their contribution to the sustainability of the city.

Although there are divergences regarding some results in different typologies, in practice, they affirm the applicability of a large share of advantages mentioned by different authors described in the theoretical part. It is also important a good planning of the urban gardens in order to minimize not only the environmental risks of this activity but also to minimize the social and economical problems that may arise from it.

Keywords: Urban Gardens; Sustainable Development; Sustainable Urban Development; Sustainability; Urban Agriculture; Sustainable Cities;

I - Introduction

The Industrial Revolution was a turning point on society in general. It marked a new age where economic needs had priority over the needs of improving living conditions. This model of industrial development considered the environment only as a mere supplier of natural resources. Developed countries, in

particular, consider that this development model have led to an increase of social and environmental problems. The local vision of a given environmental or social problem has come to have global scope as it began to affect the economic relations inside and outside of the urban sprawl or country where they occur.

By the 1960s it was possible to see the beginning of global awareness of the environment degradation. In the 1970s this concern reached its peak leading to the emergence of conferences on the topic, mainly organized by United Nations. New conferences were organized since then and in the 1990s the topic was applied to cities, as they seemed to be the main source of problems.

Gonçalo Ribeiro Telles (2011) argues that “the entire urban system requires a rural system, there is an exchange between both. In ancient Rome, agriculture was a fundamental activity that existed around cities”. The author also defends that “food production in urban communities is a sustainability strategy and one of the solutions to the problem of urban growth”.

Urban gardens are also pointed by the *Food and Agriculture Organization of the United Nations* (FAO) as a solution to be adopted by the governments to make cities more sustainable and to achieve the stipulated goals (FAO, 2012).

II – Sustainable Development

The concern about sustainability reached its peak in 1970s and 1972 was the year of the first conference on environmental problems, which took place in Stockholm and it was called as United Nations Conference on the Human Environment (SUSTAINABLE DEVELOPMENT GOALS). This conference aimed to protect the human environment and to prevent its degradation.

It marked a turning point in the development of international environmental politics, and in the year of 1983, convened by the United Nations Secretary-General, has emerged the World Commission on Environment and Development, chaired by the Norwegian Prime Minister, Gro Harlem Brundtland. The main goal of this Commission was to draw up a report about environment and development (Agência Portuguesa do Ambiente). This report was presented on 1987, known as “Our Common Future”, and has cleaned up the importance of managing the resources of the planet, in order to provide the ability of future generations to meet their own needs (WCED, 1987).

Later on, new conferences had taken place, aiming to discuss, once again, the same issues and to review the commitments of the previous conferences. However, in 1990s the need to apply this concept to the cities emerged, do to their increasing accumulation of environmental issues and their excessive waste of resources, compromising the ability of future generations to meet their own needs. One of the main conferences to debate this topic was held in Rio de Janeiro, in 1992, which resulted in a document called Agenda 21 that included programs which aimed to make cities more sustainable. Local authorities play a crucial role to fulfil the objectives of this document once that many problems and solutions have their roots in local activities. The increasing awareness of a significant number of European cities and local authorities led to the first Conference on Sustainable Cities & Towns, held in 1994, in Aalborg. The Aalborg Charter, inspired by

Agenda 21, is the document resulted from this conference, approved by the participants of this conference (SUSTAINABLE CITIES PLATFORM). This conference was held later in other European cities, always stressing the importance of the local authorities to strive for sustainable development and to implement Local Agenda 21.

There are currently some programs proposed by the United Nations and signed by the governments aiming to promote the sustainable development. It's important to point out the 17 Sustainable Development Goals (SDG). It was signed by almost all the countries in the world and defines the priorities about sustainable development to 2030.

III – Urban Gardens

Urban gardens have been gaining more prominence and they are referenced as a solution for a large share of the urban problems, mainly by the United Nations, through Food and Agriculture Organization of the United Nations (FAO). Although agricultural practice is currently associated with the rural environment, the fact is that this activity have existed in the cities for thousand years, furthermore it was due to agriculture and the sedentarization process that the first cities emerged (Girardet, 1996). Agriculture activity is since then essential for the cities, once that this activity provides food to them. But it was with the Industrial Revolution that the urban gardens as we know them emerged. The exponential

growth of the urban centres led to the degradation of living conditions, so the green spaces, in which urban gardens are inserted, have gained more importance. Since then urban gardens assumed an important role according to socioeconomic conditions of that period, playing a subsistence role in times of crisis and war and a recreational role in prosperity times.

Nowadays the situation is different. Cities are facing a lot of different environmental problems, so urban gardens appear to be a crucial solution for a large share of them, as they can help reduce negative environmental impacts, according to the projections pointed by different agencies related to the growth of urban population.

Urban horticulture is an integrating activity of urban agriculture, and can be defined as the production of vegetable, fruits, tubers and roots, mushrooms and ornamental plants (Drescher, 2004). Urban gardens usually have their dimension limited by plot availability. There are different typologies, like small private spaces for own production, subsistence plots for individual or community use and recreational or pedagogical gardens. There is also a non organized form of urban gardens that occupy vacant lots.

There are many benefits associated to urban gardens, both at the environmental, social and economic level. Some of them are related to green spaces, since the urban gardens are a green space, as the improvement of air quality and the biodiversity promotion. However, urban

gardens can contribute in several other ways to the city growth and development and its sustainability. First of all its location, the fact that the urban gardens are within the city, and in turn close to the markets, allows the access to fresh products and also reduce the emissions related with the transportation, term known as *Food Miles*. Urban gardens can also help in urban requalification, using in a rational way abandoned or degraded spaces, thus increasing their aesthetic value. There are a lot of other benefits, like soil protection, environmental education, food security, health and well-being, social integration and others.

However, horticultural practice can bring some impacts, particularly regarding the pollution. An important aspect to take into account is the practice of organic agriculture. This practice promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity (Codex Alimentarius Commission). Due to the non-use of synthetic materials, this is a more appropriate alternative to the goals of sustainable urban development.

Apart from the organic practice there are other aspects to take into account for a good planning of the urban gardens that can minimize other impacts or negative aspects. Examples include the location, soil characterization and water resources characterization. In addition to these examples are the creation of support structures for gardeners, the slope and the formation and monitoring of gardeners.

IV – Study Cases

The first urban gardens in Portugal, in an organized form, date from 2004, located in the city of Porto. Since then, this number has been growing and the phenomenon of the urban gardens has been spreading across the country, especially in Lisbon and Funchal.

The gardens have always been part of the city of Lisbon, being integrated into the urban fabric as the city grew. However, due to the exponential growth of the city, this gained space against rural landscape which surrounded the city, making farmlands increasingly scarce to find.

In the year of 2007, in the city of Lisbon, as a part of a bigger plan, started the project of the urban gardens. This plan started with the architect Gonalo Ribeiro Telles, known as *Plano Verde de Lisboa*, and it pointed urban gardens as a solution of green space for the city.

The city of Lisbon has currently diverse urban gardens, some of them with different typologies, varying between social and recreational gardens. The first horticultural park inaugurated was Quinta da Granja, in 2011, followed by Campolide gardens, in the same year, the first consisting of a social typology and the second of a recreational one.

The differences in both typologies are related to price, which is lower in the social typology, to the minimum dimension, which is 80 sqm in social typology and 50 sqm in the recreational and to the purpose of the activity, concerning the satisfaction of part of the food needs in the social typology and

improving the living quality of the gardener in the recreational one by promoting the contact with the nature.

There are other different horticultural parks from those mentioned above. From these parks it is possible to highlight *Quinta Pedagógica dos Olivais* and *Quinta do Zé Pinto*, both of pedagogical genesis. Another one that deserves special prominence is the *Parque vinícola de Lisboa*, mainly because it is a different initiative from those mentioned so far. This park is the result of a partnership between the Lisbon municipality and a company dedicated to the production, bottling and marketing of Portuguese's wines.

The practical component of this dissertation is supported by the analysis of 5 study cases, *Parque Hortícola da Quinta da Granja*, *Parque Hortícola de Telheiras*, *Parque Hortícola Aquilino Ribeiro Machado*, *Parque Hortícola da Quinta das Flores* and *Parque Hortícola do Vale de Chelas*. The analysis was made through a survey of gardeners of the above mentioned horticultural parks, aiming to better understand their impacts on the city. This survey was carried out in person, which

allowed a better understanding of what the gardeners went through in the gardens and it also allowed a more precise answer which led to more precise conclusions.

The survey is divided into 7 sections, however, 3 of them are presented together, since it is easier to cross-check data and to draw conclusion about them.

The sections are: Gardener characterization, relationship with the garden, motivations, environmental analysis, social analysis, economic analysis and additional information.

With the data collected from the survey, it can be seen that 80% of the interrogated people are male, being the predominating genre present in all gardens.

Regarding the age range, it can be concluded that a large part of the population is elderly, with 73% of the interviewed people aged 60 or over. About this information, it is important to note that, although the visits were made on different days of the week and at different times, it is much more likely to find elderly gardeners, as 78% of the gardeners aged 60 or over visit the garden, as shown in table 1.

Table 1, Weekly and daily use frequency by age range

Urban Garden	Number Respond.	Days per week				Hours per day			
		1 dia	2 a 3	4 a 6	Diari.	< 1	1 - 3	3 - 5	> 5
30 - 39	2	0	1	1	0	0	2	0	0
40 - 49	4	1	2	1	0	1	2	1	0
50 - 59	8	0	0	2	6	0	5	3	0
60 - 69	23	0	4	2	17	0	11	9	3
70 - 79	12	0	1	0	11	2	8	0	2
>= 80	2	1	0	0	1	0	0	2	0
Total	51	2	8	6	35	3	28	15	5

About the schooling, 59% of the people asked, only attended primary school, showing that this primary level of education is prevalent in the horticultural parks of *Quinta da Granja*, *Quinta das Flores* and *Vale de Chelas*. It should be noted that these gardens are of a social typology and therefore attended by deprived and older population. These factors may be linked since underprivileged and elderly people have restricted access to education. In the horticultural park of *Telheiras* the scenario is different, out of 7 people inquired, 6 completed higher education and 1 finished secondary school, fact that is linked to the typology and location of this garden. In the horticultural park *Aquilino Ribeiro Machado*, of the 5 people inquired 3 have higher education and the other 2 just finished primary school, being the last ones 59 and 72 years old, which enhances the connection between age and education

Environmental analysis was carried out making questions about organic agriculture, use of domestic waste, quality of the products and the distance and the means of transport used to go to the garden.

The table 2 sums up the data about the means of transport used and the distance to

garden. Through the analysis of this table it is possible to conclude that the distance to the garden influences the means of transport used. The people who live closer to the garden go on foot, while those who live more distant, use public transports or their own car. It is important to highlight that 2 gardeners from *Quinta da Granja* live far from the garden, more than 5km, so they choose the car to go to the garden. The same happens in the horticultural park *Aquilino Ribeiro Machado*. There is a gardener who lives 10km far from the garden.

Organic agriculture is considered a good practice that reduces the impacts of the urban gardens. Although organic agriculture is a practice imposed by the municipality, it is important to evaluate the conscience of the gardeners for this practice. Thus, gardeners when asked if organic agriculture was not compulsory, they would practice it, 92% answered affirmatively, they would practice it even if it was not compulsory, as seen in table 3. Table 3 also shows if the gardeners use domestic waste and what other materials they use.

Table 2, Environmental Analysis, Means of transport used and distance to the garden

Urban Garden	Number Respond.	Means of transport used				Average Distance
		By foot	Car	Bicycle	Public tran.	
Q. Granja	12	7	2	0	3	2708m
Telheiras	7	7	0	0	0	393m
Aquilino R.	5	2	1	1	1	5060m
Q. Flores	6	4	1	0	1	1100m
V. Chelas	21	19	2	0	0	705m
Total	51	39	6	1	5	

Table 3, Environmental Analysis, Organic Agriculture, Use of domestic waste, Materials used

Urban Garden	Number Repond.	Would you practice organic agric. if it was no compulsory?		Do you use domestic waste?		What other materials do you use?		
		Yes	No	Yes	No	Manure	Gard. Wa.	Nothing
Q. Granja	12	12	0	10	2	11	4	0
Telheiras	7	7	0	5	2	6	0	1
Aquilino R.	5	4	1	4	1	3	2	0
Q. Flores	6	6	0	5	1	6	0	0
V. Chelas	21	18	3	15	6	21	0	0
Total	51	47	4	39	12	46	6	1

According to the data, 76% of the people inquired use domestic waste. It can also be seen that 92% of the gardeners use horse manure, since its use is allowed by the municipality. However, there are some gardeners that affirmed to use garden waste, like leaves and grass clippings.

The practice of organic agriculture differs from the conventional one, which influences the quality of the products. For this reason, gardeners were asked to compare their products to those of the supermarkets. It was possible to understand that 92% of the respondents consider their products superior to those of the supermarkets. It is important to highlight that the conduct of the survey in person allowed to better understand how this comparison is made. First of all, the gardeners know what they grow and they are more confident about their products. Another aspect is the taste and texture, some gardeners said that although their products do not look good they are tastier. It is also important not to confuse this quality with the nutritional values, although

many people consider these products far superior to those from the supermarket, and so they believe its nutritional value is superior, according to some references there is not much difference in these values. Organic products generally contain more vitamin C. The big difference is the presence of pesticides, thus making conventional products harmful to human health and environment (Gomiero, 2018; Huber *et al.*, 2009).

About the social component, gardeners were asked if urban gardens allowed to create new friendships, to promote the interaction between them and if they help each other. Table 4 sums up the answers to these questions. It is possible to see that urban gardens have a positive impact on the social component. Only one person said that urban gardens didn't promote the interaction between gardeners. Regarding the question of new relationships, some gardeners responded that their plot was adjacent to the people they already knew before this project had started, and they also shared the same

shelter, so they interacted more with each other and for that reason it was less likely to create new friendships. However, 92% of the respondents, some of whom in the situation described above, affirmed they have created new friendships with other gardeners.

About the cooperation relationship, only 2 respondents said that there wasn't a cooperation relationship. The rest of them, 96%, said that they helped each other. They used to share knowledge, material, products and seeds.

Table 4, Social Analysis, Questions about promotion of interaction, creation of new friendships and cooperation relationship

Urban Garden	Number Respond.	Promote interaction?		Allow to create new friendships?		Is there a cooperation relationship?	
		Yes	No	Yes	No	Yes	No
Q. Granja	12	12	0	10	2	12	0
Telheiras	7	6	1	6	1	6	1
Aquilino R.	5	5	0	5	0	5	0
Q. Flores	6	6	0	6	0	6	0
V. Chelas	21	21	0	20	1	20	1
Total	51	50	1	47	4	49	2

Regarding the economic component, the gardeners were asked about the destination of the products, the reduction of horticultural products bought in the supermarket and the economic contribution to the household. This information is summarized in table 5.

About the destination of the products all the inquired people said that they used them for own consumption and 92% affirmed that they also offered them.

To the question about the reduction of the products bought in the supermarket, only 2 persons said that they didn't reduce it. The economic contribution was the question where more divergences were found. This is related to the typology of the garden. It is important to highlight that the horticultural park of Telheiras is included in the recreational typology, and the price for that garden use is higher than in social gardens.

Table 5, Economic component

Urban Garden	Number Respond.	Destination of the products		Reduction of horticultural products bought		Economic contribution for household?	
		Own Con.	Offer	Yes	No	Yes	No
Q. Granja	12	12	12	11	1	9	3
Telheiras	7	7	6	6	1	1	6
Aquilino R.	5	5	5	5	0	3	2
Q. Flores	6	6	6	6	0	5	1
V. Chelas	21	21	18	21	0	14	7
Total	51	51	47	49	2	32	19

The gardeners were also asked about other benefits not mentioned before and about negative impacts of the urban gardens on the city. The most mentioned options were the *best use of free time*, *embellishment of the city*, *teaching the meaning of rural life*, the *valorisation of agriculture*, *bringing rural life closer to the city* and the *better use of vacant lots*.

About the negative impacts, 69% of the inquired people did not recognize any negative impact that urban gardens could bring onto the city. The only negative impacts that were perceived were *theft*, *rats* and *vandalism*. The thefts were only mentioned in the horticultural parks of *Quinta da Granja* and *Quinta das Flores*. Although this does not constitute a negative impact to the city itself, if it occurs regularly can make gardeners feel more demotivated to work in the gardens and consequently cause their abandonment.

Finally, it is important to highlight some aspects, mentioned by the gardeners, that can contribute to the better planning of the gardens. These aspects are: the soil, that could have less stones, the use of green

spaces waste, like leaves and grass clippings and the construction of a toilet.

V – Conclusions

This work has as its main goal the evaluation of the impacts that the urban gardens have on the city, aiming to understand its contribution to the sustainability of the city. The theoretical part sums up the information about sustainable development and urban gardens, which allows to better understand them. It is also possible to see that urban gardens are pointed as a solution for most of the problems lived in the cities, in theory.

Through the case studies it is possible to evaluate the benefits mentioned in the theoretical part and to verify, or not, their applicability.

It is also shown the applicability of the environmental and social benefits described in the theoretical part. About the environmental aspect it is important to highlight that location influences the means of transport used, and for that reason it must be taken into consideration when planning it.

It is also important to say that, although organic agriculture is a compulsory practice, the gardeners are aware of this practice and their benefits, mainly in the quality of their products. About the economic aspect, it was possible to see that the typology influences whether or not it makes an economic contribution to the household.

Finally, it can be concluded that urban gardens are a solution for more sustainable cities. However, certain aspects need to be taken into account, some of which are intended to make these spaces better planned and to solve problems experienced in other urban gardens. Special emphasis to organic agriculture, which constitutes a solution that reduces a lot of concerns related with the pollution.

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