

Combining top-down and bottom-up gardens in Lisbon as an improved planning strategy

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Keywords: Combination Strategy, City Planning, Urban Management, Participation, Community Projects

Abstract

This paper compares two concepts of urban agriculture (UA): a) top-down allotment gardens and b) bottom-up participative gardens. The example studied for the former are: 3 Parques Hortícolas of Lisbon city council (LCCHP), which are horticultural parks that include playgrounds, bike paths, etc., on public land. The case study for the latter is Horta do Baldio (HB), a participative garden on private land. The goal is to identify the advantages of a possible combination of the two concepts for planning. This study includes two methodologies: applying a questionnaire and comparing other characteristics of LCCHP and HB such as waiting lists, costs and the motivations of the gardeners. The data gained was analysed by using the following indicators: social characterization of the gardeners, their opinions about the garden's role in city life, their reasons for participation, cultural initiatives, waiting lists, access to general public, time consumption and costs. The questionnaire led to similar answers in both garden types except that only HB gardeners included participation and communitarian spirit as important factors. The conclusion is that both types of garden have their strengths but the bottom-up initiative has relevant advantages: participation and communitarian spirit caused "hands-on" implementation and maintenance of the garden, encouraging cultural activities. There are no waiting lists and the garden also costs less than those in the top-down projects because more human resources were involved in the creation and maintenance. On the other hand HB is more time consuming since

volunteers are involved in the planning and management, which can cause conflicts e.g. when planning the future of the garden. The integration of urban gardening bottom-up initiatives on city planning, on both public and private land, could catapult Lisbon UA to a higher level of sustainability. Promotion of bottom-up initiatives or combining both strategies could increase participation, optimize community initiatives and costs, decrease waiting lists, create different public access experiences and increase gardening areas which better support the continuity of the city green structure (CGS).

Introduction

History of urban gardening in Lisbon

The history of UA in Lisbon can be traced to several land donations from the King to the Church that created farms until the 15th century. In medieval times these farms were integrated within the city limites (Folque 2000; Ramos 2011) and supplied the city with food until the 20th century (Marat 2015; Niza *et al.* 2016). However, only during the second half of the 20th century urban planning included agriculture inside the city green structure (CGS) (Telles 1997). This structure merges most of the green areas of the city including now 11 horticultural parks (Fig. 1) – *Parques Hortícolas* (LCCHP).

Simultaneously, in the 20th century public and private land was often spontaneously occupied by people who wanted to farm. Even marginal lands, like freeway buffer zones, were occupied. The implementation of LCCHP in areas where such occupation occurred gave rise to problems once people realized that they had to pay for the space requalification and the public water. Especially in eastern Lisbon, where using water from sewer or small storages is common in gardens, there were some incidents; e.g. the city council technicians had to be accompanied by the police and even to resort to coercive action on one occasion when citizens refused to evacuate the community garden *Horta do Monte* in Graça (Fig. 1, nr. 8), in an attempt to save it from subsumption into LCCHP (Boaventura 2013; Ramos 2011). However, in general LCCHP seem to be well accepted by the population, as

the long waiting lists for plots prove. These gardens provide citizens with an increased quality of life by including walkways, bike-lanes, scenic views and improving the landscaped city.

Meanwhile several bottom-up community projects, done by citizens on an independent basis, popped up without support from the city council. These include: *Horta do CNN*, *Horta do Braço de Prata*, *Horta de Benfica*, *Horta do LNEC*, *Horta do Baldio* and *Horta da FCUL* (Sousa 2012). This study highlights advantages of bottom-up and top-down projects to promote the integration of both approaches. This integration already happens in different ways at many projects around Europe and sustainable results are shown in most of the cases (Petersen 2014; Sousa 2016; van der Velden 2012).

Methodology

Two concepts of urban gardening are studied: allotment gardens - 3 LCCHP and *Horta do Baldio* (HB), which is one of the bottom-up gardens popping-up in Lisbon. This study compares previous work by Gonçalves (2014) on 3 LCCHP to HB, by applying the same methodology in order to create indicators based on main characteristics of both types of garden. A questionnaire was conducted in order to collect data. The questionnaire consisted of the same content as that used by Gonçalves (2014), where the social characterization and motivations of gardeners from 3 LCCHP were investigated. We applied the same questionnaire to HB gardeners and compared the results to those acquired by Gonçalves (2014). Additional data from the gardens was gathered. Information about the costs was acquired from public hiring sites, from interviews with city council technicians and with those responsible for the installation of HB, and from HB meeting minutes regarding maintenance costs. Other types of sources were used, such as description of the projects (Gonçalves 2014; Madeira 2015; Sousa 2014) to confirm and supplement information gathered via the questionnaire. Data collection allowed the comparison of the two types of gardens and the creation of specific indicators to highlight advantages of bottom-up and top-down gardens.

Findings: Comparative study

Questionnaire

Data extracted from the questionnaire is presented below for the following gardens:

Top-down LCCHP gardens on public land:

1. Parque Hortícola da Granja (Fig. 1; nr. 1); includes bike/pedestrian path on the side
2. Parque Hortícola de Campolide (Fig. 1; nr. 2); includes a bike/pedestrian path on the side
3. Parque Hortícola das Telheiras (Fig. 1; nr. 3); includes a bike/pedestrian path on the side and a playground

Bottom-up participative garden on private land:

1. (HB) - Horta do Baldio (Fig. 1; HB), a garden on private wasteland, about 5000m² in Campo Pequeno that began as an artistic project (Madeira 2015). The garden was created as a place for an artistic event and the volunteers that helped create it decided to continue to take care of it after the event ceased.



Figure1: LCCHP - horticultural parks of Lisbon city council (*Parques Hortícolas*) as part of the City Green Structure (CGS) and Horta do Baldio (HB) (source: Câmara Municipal de Lisboa)

Tables 1 and 2 register the data extracted from the questionnaire:

Description		Gender		Age Group			Household				When it comes to Garden		How many Hours/days working in the garden			Refers to the Use			Seeds
Location	Number of Respondents	M	F	20-40	40-60	>60	<=2	3	>=4	Unemployed	Week	Weekend	<=5	>5 a <=8	>=10	Chemical fertilizer	Manure/Compost	Purchase/Guard	Exchange with Neighbors
Telheiras	16	9	7	0	11	5	5	4	7	1	15	14	16	0	0	0	16	16	2
Campolide	11	6	5	0	7	4	8	2	1	4	9	11	11	0	0	0	11	10	0
Granja	22	15	7	1	7	14	14	4	4	3	21	21	18	3	1	4	21	20	3
Sub-Total	49	30	19	1	25	23	27	10	12	8	45	46	45	3	1	4	48	46	5
Horta Baldio	7	2	6	3	4	1	4	2	1	3	5	7	3	5	0	7	7	7	7
Total	56	32	25	4	29	24	31	12	13	11	50	53	48	8	1	11	55	53	12

Table 1: Characterisation of gardeners

Gardeners are mainly middle age and 20% were unemployed, having 2-3 family members on average. Gender changes from mainly males at LCCHP to mainly females at HB. About 86% of the respondents work an average of 5 hours in the gardens, that is, for a week of work of 35 hours, corresponds to approximately 14%. Education was not included in the table but was probed by the questionnaire: education was higher at HB than LCCHP gardens. The LCCHP garden with similar levels of education to HB was Telheiras.

Description		Main motivations and opinions of the gardeners														
Location	Number of Respondents	Working with the Nature	Economic				Exercise/ Relax	Likes Agriculture	Eat Better Quality products	Occupy Free Time	Practicing Organic Farming	Help preserve biodiversity	Beautify the city	Teach the Younger about rural culture	Create spaces of Conviviality Among the elderly	Do something Productive
			Sale of Vegetables	Save on the purchase of Vegetables	Increase the Consumption of Vegetables of family	Help Family Members										
Telheiras	16	8	0	3	1	0	6	11	9	5	7	3	8	7	5	5
Campolide	11	2	0	3	0	1	2	7	9	3	6	0	5	2	2	6
Granja	22	2	1	4	0	0	3	17	9	7	3	0	10	11	4	3
Sub-Total	49	12	1	10	1	1	11	35	27	15	16	3	23	20	11	14
Horta Baldio ⁽¹⁾	7	7	3	3	1	0	7	7	3	7	3	4	7	7	7	6
Total	56	19	4	13	2	1	18	42	30	22	19	7	30	27	18	20
(1) Other reasons:																
Participation	7															
Community Spirit	7															
(1) All reported the two motivations.																

Table 2: Motivations and opinions of gardeners

The questionnaire led to similar answers in both garden types except that only HB gardeners included participation and communitarian spirit as important factors (see discussion).

Further data

Data gathered was supplemented by interviews with city council technicians as well as with those responsible for setting up HB and by consulting the HB meeting minutes in order to generate selection of other indicators to enable cross comparisons:

Waiting list: at LCCHP there are waiting lists for plots as opposed to HB where gardeners decided that everybody can take part. This is possible because there are no individual plots;

Access to general public: through pedestrian and cycle paths in the vicinity, citizens enjoy the scenic aspect of LCCHP, (Fig. 2-4). Citizens are typically not supposed to enter these gardens. At HB everyone is allowed to enter the garden. HB is less known by the public but all users report having a very pleasant and relaxed experience there (Fig. 5-6).



Figure 2, 3: Parque Hortícola Quinta da Granja (source: Quinta da Granja)



Figure 4: Parque Hortícola Quinta da Granja (source: Quinta da Granja)



Figure 5: Horta do Baldio (source: Sousa)



Figure 6: Horta do Baldio (source: Sousa)

Level of shared equipments, structures and tools: the two types of garden share tool houses, water faucets and composting piles. LCCHP plots are individual. At HB everything else is shared too: harvested vegetables, seeds, plants, cooking for events using the garden vegetables, tasks of all type. The volunteers also meet outside the garden for social or garden management related reasons. All these tasks imply a higher level of volunteer work.

Other uses of the garden: Only HB includes cultural events and workshops for the public (parties, courses, workshops, art events).

Management: LCCHP is managed by the municipality, leaving to gardeners same logistics and materials management; at HB all management work is done by volunteers and this can be a lengthy and sometimes confused process as decisions must be made communally.

Water distribution: Water is paid for LCCHP where as it is free, but precarious, at HB.

Other uses of the garden: only HB gardeners answered the questionnaire "further coments" where they unanimously highlighted the importance of participation and community spirit. Garden meetings and informal conversations confirmed the importance of this, to the extent that the gardeners saw their project as a meaningful social experiment.

Land ownership: At HB land is private owned and there is a contract that borroughs it. At LCCHP the land is public and there is an individual contract signed between gardeners and the city council allowing gardening under certain rules.

Costs: these were analyzed for the implementation phase and maintenance phase.

Implementation phase

HB implementation costs were at 3.25 € (Table 3). Usually LCCHP hires external services for this phase as opposed to HB where the work was done by volunteers. HB data for implementation costs were collected through an interview with Julio Correia who set up the project. Table 3 shows the costs for *Parque Bensaúde* of 20€. This is another LCCHP garden No data was available on public hiring sites (nor known by interviewee) for the 3 LCCHP gardens where the questionnaire was conducted. It is assumed that the costs for the 3 LCCHP are similar to those of *Parque Bensaúde* given their similarity. This cost was used as reference for comparison to HB costs.

Economic evaluation criteria are analyzed for the two concepts, but at this stage it has not been possible to obtain detailed data on the costs of public urban gardens. We have chosen to work with overall unit costs to ensure consistency in the analysis.

Maintenance phase

The maintenance is done by gardeners at HB whereas at LCCHP only the common parts are maintained by the city council. It was not possible to establish maintenance costs for LCCHP (not known by interviewee), so we have used costs from a city council garden

in Guimarães similar to LCCHP (interview to Hugo Torrinha). Costs were at 1,20€, whereas at HB they made up 0.4€ (Table 3).

Management

Management is transversal to both phases. Implementation management costs at HB consisted only of expenses for Julio Correia (500€ for 3 months work) from the artistic events company that started the project. Implementation work was undergone by volunteers, so there were no costs. There are no maintenance management costs at HB because the gardeners do all the work. As at LCCHP, management costs are included in salaries paid by the institution to several technicians involved in the process for implementation and maintenance, so it seems likely that they are cheaper at HB for both phases.

III. Comparative cost analysis: bottom-up gardens vs top-down gardens			
ITEM	Designation	Year	Cost per unit €/m ²
Installation of urban gardens, other green spaces and mixed projects	2. Instalation of urban gardens (Parque de Bensaúde)	2012	20,00 €
	4. Instalation of comunity gardens (Baldio - HB)	2014	3,25 €
Maintenance of green spaces	3. Horta do Baldio	2015	0,40 €
	4. Horta Pedagógica de Guimarães	2014	1,20 €

Table 3: comparative cost analysis: bottom-up gardens vs. top-down gardens

Indicators

In order to analyze the data, the most relevant axes for comparison were extracted as indicators. Table 4 compares both types of garden across these indicators:

Description		Questionnaire			Other records of the projects			Costs	
Indicators	Social characterization	Opinions	Motivations	time consumption	Other uses/Cultural initiatives	Access to general public	Waiting lists	implementation ^{b)}	maintenance ^{a)}
LCCHP	Similar	Similar	Similar	< 5	Non existing	No access; cenical experience present	yes	20,00 €	1,07 €
HB	Similar	Similar	Similar except for adding participation and community spirit	< 5	Cultural initiatives and social experiment	Access to general public	No	3,25 €	0,40 €

Table 4: Summary of indicators; a) data extracted from Guimarães Project of allotment garden b) data extracted from Parque Hortícola Bensáude; part of LCCHP; not including other green space areas

Questionnaire indicators are important for the distinction of participation and communitarian service as outstanding factors, since all the other indicator showed same results (only for education which is included in the social characterization differences between LCCHP and HB were found: the latter has higher levels of education only similar at *Telheiras Parque Hortícola*, for LCCHP.

The importance of other indicators and the costs is to highlight differences on the characteristics of the projects that could be considered to be advantages or not.

Discussion

Discussion is based mainly on indicators:

The comparison across questionnaire indicators (Table 4) shows that gardeners of the two types of projects have similar views. Only one difference is noted: HB gardeners included participation and communitarian spirit as important (Table 3). HB gardeners highlighted this in the 'further comments' section of the questionnaire. The importance of participation and communitarian spirit is corroborated by other considerations discussed below.

A difference between the two garden types is that cultural initiatives and alternative uses of the garden only happened at HB, on privately owned land. The contract made by each individual with the city council only allows gardening on public land, so this can be one of the causes for the non-existence of alternative uses. This can be complemented with differences in education levels between gardeners at LCCHP and at HB. As noted, education at HB is much higher than at 2 of the 3 LCCHP gardens. Both reasons could explain why at *Parque Hortícola de Telheiras*, where gardeners had the most similar levels of education to HB gardeners, showed no cultural uses of the garden since they did not feel the garden was their's to use for other ventures, although the project is on public land. At HB, due to the importance of communitarian spirit noted by the gardeners, they not only interacted more with each other which aids development of joint endeavors, feeling entitled to use the whole of the garden, even on borough land, for alternative purposes.

Another difference between the two types of garden is that HB was significantly more cost effective than top-down gardens. Table 4 shows that the costs for implementation are cheaper for HB bottom-up garden in comparison to LCCHP. Maintenance costs were not possible to obtain from an interview with a technician at Lisbon city council, because further investigation is needed. However in an interview with a technician from Guimarães city council, costs were ascertained for *Horta Pedagógica de Guimarães*, an allotment garden project similar to LCCHP. The comparison shows lower maintenance costs for HB (Table 4) as compared to the Guimaraes garden. The technician mentioned that 90% of the maintenance costs are spent on human resources. Lower costs are likely due to the greater volunteer work that took place at HB

compared to LCCHP gardens. Other factors can influence costs such as the level of shared resources which is higher at HB; this may be directly connected with the decrease in costs¹. Political and social awareness is present at HB as interviews and conversations show. HB gardeners are more politically and socially aware and this is linked with more social participation and proactivity. This may influence the costs indirectly (Madeira 2014; Sousa 2016) because they:

- Help create the garden
- Want the project to continue even after the initial time frame
- Socialize during other times rather than gardening hours, (events, courses, planning meetings etc.)
- Feel strong about having free access for everyone
- Share more tasks including management
- They also share all the production factors and garden produce and services

Management costs are transversal to both phases for both types of projects. Implementation work was done by volunteers; thus there are no management costs for this phase except for the implementation management costs that were paid for the cultural events company starting the project. There were also no management costs at the maintenance phase at HB due to the gardeners doing all the work. As at LCCHP the management costs are included in the salaries for implementation and maintenance.

It is clear that the higher level of volunteer work at HB lowered the overall costs of the project compared to LCCHP. The question arises whether the higher level of volunteer work is connected to the unanimously reported values of participation and communitary spirit. Could the intrinsically communitary nature of HB garden have motivated volunteer work?

It seems plausible that HB gardeners have a greater stake in the garden as a whole which motivates them to contribute more time and effort to its implementation, maintenance and management. HB gardeners' responsibility seems to span wider than LCCHP gardeners,

¹ The projects are very different. Thus it is likely that there are other factors beyond the scope of this study, such as different criteria for expenses as well as probably smaller funds at HB that came from donations and selling of products and services. Nevertheless this does not seem to influence on the importance of volunteer work in the decrease of costs.

whose responsibility putatively spans little further than their individual plot. This greater stake or span of responsibility may explain HB gardeners' greater commitment and investment in the garden. The fact that HB gardeners unanimously highlighted the importance of communitarian spirit is of utmost importance. The gardeners' responsibility is not only more widely spread in terms of square meters, but also in that they owe each other hard work and commitment given their common goal and communitarian distribution of harvests. Working towards a common goal on a project that has collective rather than individual ownership seems to be highly motivating to the volunteers. Furthermore these projects types could stimulate participative processes. This are advantages that top-down initiatives could benefit from. The institutional support would allow bottom-up projects to flourish faster and more widely. Other advantages that bottom-up projects generate are:

Access: Only at HB does the public have full access to the garden. At LCCHP non-participants can enjoy scenic experiences when they walk or cycle on nearby paths. Full access to the gardens could increase the quality of life of the population by enabling a more interactive and eco-therapeutical experience.

Inclusion: Waiting lists exist for LCCHP but not for HB. These could decrease if the city council decides to help implementing participative bottom-up gardens, such as HB. Waiting lists could decrease by adopting a participative approach to gardens since more people are allowed to access per square.

Space optimization: The municipalities are struggling with an increasing scarcity of space for gardens. Participative gardens provide a useful framework for optimizing space as they allow more people per square meter.

Conclusions

If participative bottom-up gardens were to be adopted by city planning, it is likely that there could be several advantages for both types of project that could increase the quality of UA in Lisbon. The questionnaire, as confirmed by other data, shows the existence of participation and community spirit which is likely to encourage volunteer work that seems to be related to lower costs of the bottom-up project. At the same time, this type of garden enables the

participation of the gardeners in decision-making processes, from the conception and implementation to the maintenance phase. The likelihood of decreasing costs seems possible because there is a higher level of volunteer work in bottom-up initiatives. The increase of volunteer work in municipal initiatives will help, certainly, to relieve internal resources, whether human, financial or otherwise. This potential should be given attention to by city planners.

Further advantages of bottom-up gardens may include the increase of inclusion through the decrease of waiting lists, space optimization for gardens and increased accessibility to gardens. Thus, when minor problems are controlled, such as management issues, it seems worthwhile for bottom-up initiatives to be supported on an institutional basis. The elaboration of further urban garden models and similar green spaces will largely depend on future research.

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