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An Analytical Approach to Support Urban Agriculture Policies Development: Case Study of Barcelona

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ABSTRACT

The increasing impact due to urban population's food supply causes a series of negative externalities related to food production, transformation and transportation. FAO and other institutions are trying to integrate traditional models of food supply with alternative ones like Urban and Peri-Urban Agriculture (UPA). Defining the drivers that motivate the participation in different types of UPA could be useful to plan more participated and effective UPA development policies. Barcelona (Spain) hosts a number of cases representing different declinations that UPA can assume. This work aims at describing the differences in terms of motivations to enter the various typologies of Urban Agriculture (UA) in Barcelona. Data were collected through semi-structured interviews to 4 groups of users representing 3 of the most widespread models of UA initiatives in Barcelona (Allotment Gardens, Community Gardens, Pla Buits.) The results showed that participation in UA is mainly motivated by relational aspects and knowledge exchange and differences exist among the various UA models. Political reasons are mostly influencing the Community Gardeners while Pla Buits users' mains motivations are related to socialising and Allotment gardeners are mainly motivated by environmental aspects. Differences in the participants' demographic characteristics also emerged. Better targeted public policies contents and communication strategies for UPA development can thus be derived by the results obtained; to this end, recommendations have been provided. Further research should broaden the range of case studies and the sample size, in order to provide a more effective and comprehensive tool for tailoring UPA developing strategies to different contexts.

Keywords: Urban and Peri-Urban Agriculture; Urban Planning; Motivations

1. Introduction

Urban agriculture and peri-urban agriculture (UPA) is spreading both in developed and developing countries as a tool to reduce the negative externalities related to food consumption and to facilitate a safe and healthy food provision. UPA has been defined as "*an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or 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, 2000; 11).
UPA can play a central role for sustainable urban growth both in developed and developing countries adding benefits from the economic, environmental and social points of view (Deelstra & Girardet, 2001; Djalali & Virgilio, 2007; Mougeot; 2000). From an economic perspective UPA represents a chance for urban dwellers to generate income, it reduces the costs of food transportation and transformation and contributes to food security through self-consumption (Orsini et al, 2013; Drescher, 2002; Jacobi et al, 2000). UPA could reduce the environmental impact (CO_2

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emissions, global and local heating, reduction of urban biodiversity) deriving from urban activities (Djalali & Virgilio, 2007; Deelstra & Girardet, 2000). From a social point of view UPA activities facilitate social inclusion, diminish gender inequalities and facilitate the access to safe and healthy food in developing countries (Orsini et al, 2013; Bourque, 2000; Djalali & Virgilio, 2007).

In the latest decades FAO, UN and other international organization had recognized the importance of pursuing the development of alternative and locally based food networks involving local stakeholders and policy makers.

Local governments have tried to unify their objectives of sustainable urban development signing the Milan Urban Food Policy Pact MUFPP during the Milan Expo 2015.

The MUFPP was signed by 160 municipalities, its aim is to challenge the difficulties of current food systems to provide permanent and reliable access to safe, local, diversified, fair and healthy food; within this context the municipalities can play a strategic role in developing sustainable food systems. The MUFPP suggests to local governments a series of actions to be implemented through the supervision of municipal Food Councils in 6 dimensions somehow connected with food provision. These dimensions involve: i) governance and collaboration between private and public actors; ii) promotion of sustainable lifestyle and diets; iii) social and economic justice related to food provision; iv) food provision and distribution within the city; v) food provision and distribution; vi) reduction of food waste involving the food system operators. The MUFPP invites the local government to promote a sustainable model of local production and consumption by applying alternative ways of food provision that can include different forms of UPA (MUFPP, 2015).

FAO is among the leading actors of the international UPA development in local contexts defining general strategies and implementing field interventions. FAO's Programme for Urban and Peri-urban Horticulture has adopted a five-point approach to the sustainable development of the sector. These directives are trying to focus the attention on the importance of political commitment in guarantee soil and water provision, ensured controls on food quality and environmental impact, ensured participation and collaboration between the stakeholders involved, creation of new markets to increase consumption of food deriving from UPA (FAO 5 point approach, 2014).

Initiatives coming from singular local governments supporting an efficient involvement of UPA in local food markets have been conducted in some cities and some focus the attention on a participated approach taking into account the socio-economic and political characteristics of the stakeholders involved in UPA.

An example is the Toronto Food Policy Council (TFPC) a multi-stakeholder organism born in 1991 that deals with local food production and sustainable food provision. From 2010 the TFPC started a government, institutions and community supported initiative called GrowTO. GrowTO goal is to *"bring together the stakeholders who play a vital role in urban agriculture in Toronto and to involve, inform and propose policy solutions and on the ground actions that build and support urban agriculture"*(Toronto Food Policy Council; 15/12/2017). The GrowTO project should help urban agriculture stakeholders identifying gaps and policy hurdles in order to recommended actions helping the growth of UPA.

In Barcelona in Spain some of the most representative cases of UPA in terms of diversity and variety of involvement's level of policy makers and civil society are currently being implemented. UPA activities range from amateur bottom-up urban community gardens to high professionalised top-down peri-urban farms (Giacché & Toth, 2013). Four main categories of UPA can be found in Barcelona.

The first one includes professional enterprises located in peri-urban agrarian parks like "Agrarian Parc of *Baix* Llobregat" APBL. The APBL is a consortium born to preserve agricultural enterprises from urban sprawl, it is located in the south-west periphery of the Barcelona Metropolitan Area (AMB). Many of these are locally oriented enterprises (Maldonado et al, 2015).

The second category refers to Community Gardens, bottom-up initiatives whose objective is to create a free access space for all the inhabitants in the neighbourhood. They usually originate from an illegal occupation of abandoned spaces promoted by political movements and then extended to the neighbourhood. A network (*Xarxa d'horts comunitari*) exists with the aim of sharing information, common problems and experiences between the singular vegetable gardens (Coscaro in Bergamaschi, 2012; Calvet-Mir et al, 2016).

The third type, the Allotment Gardens are directed to retired people. These vegetable gardens are managed by the *Intisut Municipal de Parcs I Jardin* and *Xarxa d'horts urbà* which are local bodies that allocate the plots, implement the garden maintenance and monitor the use of chemicals (Coscaro in Bergamaschi, 2012).

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Lastly the *Pla Buits* (literally means "empty spaces") were born as a consequence of the 2008 financial crisis that stopped the plans for the construction of several public buildings. These empty spaces have been rented by the Barcelona city council for free and for a limited period of time to local associations in order to develop beneficial activities for the citizens. In most of these activities urban agriculture plays a central role (Camps-Calvet et al, 2016).
Nonetheless despite the local authorities' involvement in the UPA there are still several critical situations regarding the relation between urban agriculture and Barcelona metropolitan development. Problems like the unsolved situations of abandoned buildings in gentrified neighbourhoods, conflicts between local authorities and urban gardeners and enormous waiting lists for allotment gardens can possibly deriving from a lack of political guidelines and collective organization (Calvet-Mir et al, 2016; Avila-Caballero, 2016). To this extent having a better knowledge of socio economic aspects related to urban agriculture could help policy makers and civil society to find solutions that better fit the needs of the UPA stakeholders.
Some of the literature on UPA considered these problems by analysing the motivations that influence the participation to UPA initiatives in the Spanish and Catalan contexts (Reyes-Garcia et al, 2012). The authors analysed the home gardens in rural areas of Catalan Pyrenees, Central Asturias and *Sierra Norte de Madrid*. The study focused its attention on a description of the home garden, explore the motivation and evaluate the gross economic benefits. Data were collected through semi-structured interviews and the resulting motivations were classified into 5 categories (Pastime; Production quality; Economic reasons; Tradition; Physical exercise). The results showed that the main motivations were related with leisure and pastime (*ibidem*).

Table 1
Farmers motivation in rural home gardening in Spain. (Reyes-Garcia et al, 2012)

	Catalan Pyrenees $N = 103$	Central Asturias $N = 41$	Sierra Norte de Madrid $N = 58$	Total $N = 202$
Pastime	67.0	82.9	79.3	73.8
Product's quality	58.2	12.2	36.2	42.6
Economic reasons	34.0	24.4	24.1	29.2
Tradition	11.6	17.1	24.1	16.3
Physical exercise	2.9	31.7	8.6	10.4

The work showed that motivations in gardening is not only related with production and self-sustenance but it includes a series of individual and social benefits deriving from the gardening activities and their importance differs between contexts (*ibidem*).
Urban agriculture (UA) in Barcelona has been studied also from the point of view of the perception of Ecosystem Services' (ES) relevance by the farmers involved in these activities. A field research was conducted in 2013 and involved 200 urban farmers (Camps-Calvet et al, 2016).
The aim of the research was to list the main ES which the urban farmers consider as deriving from urban agriculture and their perceived importance, measured on a Likert scale. The results showed 4 macro-categories of ES: provisioning services, regulating services, habitat or supporting services, cultural services. Results showed also the overwhelming importance of cultural services (Camps-Calvet et al, 2016; 5).
An analysis of the motivations of urban gardeners was conducted in Oslo, Paris, Barcelona and Nitra between 2011 and 2014 through qualitative interviews (Calvet-Mir et al, 2016).
The work regarded different kinds of gardens from top-down allotment gardens to bottom-up community initiatives. Motivations were previously divided into 5 categories: producing food and food sovereignty, psychological and physical health, urban environment/politics/economics, socio-cultural relations, learning and education (Calvet-Mir et al, 2016, 323). The results showed that diversities in motivations exist not only between different contexts but also between different typologies of urban agriculture. Differences in organization and motivations between community gardens and allotment gardens can be observed. The former shows a central role of inter-cultural exchange as a

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motivation to enter UA, while in the latter the provision of a closed and safe space results as a more relevant motivation. Community building and social cohesion appear in both gardens' typologies (Calvet-Mir et al, 2016, 337).
The literature analysis suggests that motivations in urban gardening could vary between the different typologies of urban agriculture. Nevertheless, an approach that aims at describing the differences in terms of motivation categories for each typology of urban agriculture has not yet been developed. Furthermore, the 5 categories identifying a set of motivations to participate in urban agriculture (Calvet-Mir et al, 2016) could be integrated with other approaches (Reyes-Garcia et al, 2012; Camps-Calvet et al, 2016), thus providing a broader and more exhaustive analytical framework.
Given the impact of urban agriculture on the urban planning and development the necessity of providing an analytical approach, useful for policy makers in order to involve urban agriculture stakeholders in designing more targeted and participated UPA policies, emerged.
The main goal of this work is consequently to define a knowledge base for Barcelona's local administration in order to tailor an urban development public policy to the local community needs.
To this end the present paper examines the differences in terms of individual motivations and needs depending on the different forms of urban agriculture (UA). Consequently the two following research questions have been defined: i) are there differences in terms of motivations between the various typologies of UA in Barcelona? ii) which factors should the stakeholders consider when defining UA development strategies?

2. Methods and materials

Theoretical framework
In order to analyse the differences in terms of motivations to participate in UA, this study has defined an analytical framework, which integrates the different approaches regarding the analysis of the motivations in UA participation (Calvet-Mir et al, 2016; Reyes-Garcia et al; 2012) and the analysis of ecosystem services provided (Camps-Calvet et al, 2016); the analytical framework includes the following 6 categories of motivations:

1. *Personal wellbeing*: refers to the range of motivations involving *physical and psychological health*, (Calvet-Mir et al; 2016), *economic wealth* (Reyes-Garcia et al; 2012), *provisioning services* (Camps-Calvet et al, 2016).
2. *Environmental concerns*: all motivations concerning the *protection and regulation of urban environment* (Camps-Calvet et al, 2016) and *urban environment motivations* (Calvet-Mir, 2016).
3. *Relational aspects*: this category refers to motivations related with creation of social relations between the users of vegetable gardens, it refers to *pastime motivations* and *tradition* (Reyes-Garcia et al; 2012), part of *cultural services* (Camps-Calvet et al; 2016) and *socio cultural motivations* (Calvet-Mir et al; 2016).
4. *Knowledge exchange*: learning and transmission of agricultural knowledge among users integrated with *cultural services* (Camps-Calvet et al; 2016) and *learning & education* (Calvet-Mir et al, 2016).
5. *Political motivations*: motivations related with the re-appropriation of public spaces, membership in political movements and *urban politics* (Calvet-Mir et al; 2016).
6. *Accessibility*: In order to broaden the perspective of the factors to be considered in UA development strategies, in the present paper a sixth dimension has been explored in order to assess the farmers' accessibility requirements in terms of importance of garden's safety, closeness and to inputs (like tools and seeds) availability. This represents a precondition affecting the farmers willingness to stay in UA, more than a motivation to enter, but provides a relevant insight for public policies in order to define effective promotion strategies for UA.

Table 2
Theoretical framework

	(Reyes-Garcia at al, 2012)	(Camps-Calvet et al, 2016)	(Calvet-Mir et al, 2016)
1. Personal wellbeing	Economic reasons; Product's quality	Provisioning services	producing food and sovereignty; psychological and physical health

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2. Environmental		Regulating sevices; Habitat or supporting services	urban environment/politics/economics
3. Relational	Pastime Tradition	Cultural services	Socio cultural
4. Knowledge exchange		Cultural services	Learning & education
5. Political			Urban environment/politics/economics
6. UA accessibility			

Method of analysis

Based on the analytical framework a descriptive analysis of the main differences in terms of motivations affecting the participation to different typologies of urban agriculture initiatives, has been carried out. Likert scales have been adopted to measure the indicators influence on the users' motivation to participate in UA; the indicators have been defined by integrating those resulting from previous studies (Calvet-Mir et al, 2016; Camps-Calvet et al, 2016; Reyes-Garcia et al, 2012). The results' interpretation has been integrated with information collected from discussing with the farmers during the participation in the UA activities. To this end both an ethnographic approach and a descriptive statistical analysis were conducted.

Table 3

Indicators for each group of motivations + accessibility

Personal	*Environmental*	*Relational*	*Knowledge exchange*	*Political*	*UA accessibility*
Hobby, Income, Influenced by financial crisis, increase food security	*Green protection, Negative externalities reduction, Biodiversity,*	*Social relation, socio-cultural differences, familiar environment, part of the traditional heritage,*	*Learn; Teach*	*Implication in decision making processes, actively increase the spread of UA*	*safety, closeness, inputs availability*

Data collection

The first part of the field work aims at describing the main models of UA their goals and their relations with local political and socio economical environment.

To this end an ethnographic study has been carried out through:

1) Participant observation adopted to get in contact with vegetable gardens, to collect data on their dimensions, origins and mission, and to get familiarity with the environment and the farmers.
2) Participation to several meetings and round tables including: round tables with local stakeholders and policy makers focused on the Barcelona Metropolitan Area future development strategies; meetings with the

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network of the community gardens (*Xarxa d'horts comunitaris*) and with the coordinator of the allotment gardens network (*Xarxa d'horts municipals*). Information about the different UA types and their relations with local government and on the stakeholders involved have been collected through these meetings.

The participant observation was followed by a statistical analysis based upon primary data collected through a semi-structured interviews. To this end a questionnaire has been defined (see appendix 1). The interviews aimed at obtaining both quantitative and qualitative data through closed and opened questions; the questionnaire has been divided into three sections.

The first section is focused on the farmers' participation in UA and includes the length of the farmers' participation to vegetable gardens activities, the frequency of their participation, with how many people they share their activity and if they had previous experiences in agriculture before starting working in the urban garden.

The second section was designed to assess the perceived influence of a range of indicators on their participation to gardening activities. The farmers were asked to assess the perceived relevance of each indicator on a Likert scale. Farmers were also allowed to comment their answers, if necessary to better understand the motifs behind their scores. During the interviews open questions on the ways the participant became aware of the garden existence have been asked. In this section the priorities and needs in terms of vegetable garden safety, provision of working tools and closeness were also assessed through Likert scale.

In the third section the respondents were asked to provide their socio-demographic characteristics (gender, age, income, education). Since political motivations were considered in the analytical framework, farmers were also asked which is their political orientation.

The respondents' provenance has been divided into three categories: Catalan, Spanish non Catalan foreign has been considered to explore the possibility of motivational and/or socio-demographic differences among the respondents.

Thirty four interviews have been conducted in four vegetable gardens representing the three most developed types of urban agriculture in Barcelona, an informally occupied community garden, the garden managed by an association part of the Pla Buits programme and two allotment municipal gardens.

The interviews took place between October and December 2016; the duration of each interview was around 30-40 minutes. The languages adopted were Spanish and English since some of the respondents are foreign. Interviews were recorded with the farmers' consent. The sample's dimension did not allow to prove the statistical significance of the differences emerged in the Likert scale scores since from literature and local government's data review about 50-60 gardening activities have been registered in Barcelona. Most of them (between 30 and 40) belong to Pla Buits and Community gardens categories and around 15 to allotment municipal gardens (Camps-Calvet et al, 2016; *Diputació de Barcelona*, 2015). To this end a broader number of interviews should be provided in further studies.

3. Results

The outcomes of the participant observation and meetings with local stakeholders allowed for the definition of the different vegetable gardens mission, relation with local government, internal composition and stakeholders involved.

Regarding the *Pla Buits* the analysis focused on the vegetable garden of the association *Can Roger* in the *Sagrada Familia*'s neighbourhood, which started its activities around 2013 as a union of neighbourhood's associations. The main activity of the association is providing support to the vulnerable inhabitants of the neighbourhood by starting a soup kitchen, inaugurated in 2015. The food for the soup kitchen is provided by an external catering. Fresh products for home consumption are cultivated by the volunteers of the vegetable garden, products are consumed both by the volunteers and the soup kitchen users. The garden's activities take place two mornings per week. The association and the local institutions provide workshop on horticulture techniques. The presence of former farmers, both professional and amateur, among the volunteers grants a good level of technical efficiency in the garden's management.

The analysis of the allotment gardens was conducted in Can Cadena and Can Mestres two old country houses respectively located in Sants-Montjuic and Sant Martì districts; they have been converted into urban gardens through a programme coordinated by the Municipal department of parks and gardens (*Institut Municipal de Parcs i Jardins*) and the network of municipal vegetable gardens (*Xarxa d'horts municipals*). They are both gardens exclusively

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directed to retired people; their peculiarity is the presence of animals for educational purpose. As in the other allotment gardens of Barcelona, the access and the use of water is restricted, the use of chemicals and pesticides is forbidden. The municipality organizes workshops on horticulture techniques to teach users how to cultivate avoiding the use of chemicals, the products' sale is forbidden.

Huerta La Vanguardia is a bottom-up community garden started in Poble Nou district in 2016, following an informal occupation of a vacant soil by civil society political movements'. The occupants' assembly decided that the garden was going to be managed by all the citizens willing to participate to the activities. The production is mainly used for meals between the participants; decisions are taken by open assemblies.

Sample descriptive analysis

The gardeners interviewed were 22 male and 12 female, regarding the age 15 out of 34 were over 63 and most of them are of course allotment gardeners, young people from 20 to 40 are only present in the La Vanguardia community garden.

Table 4

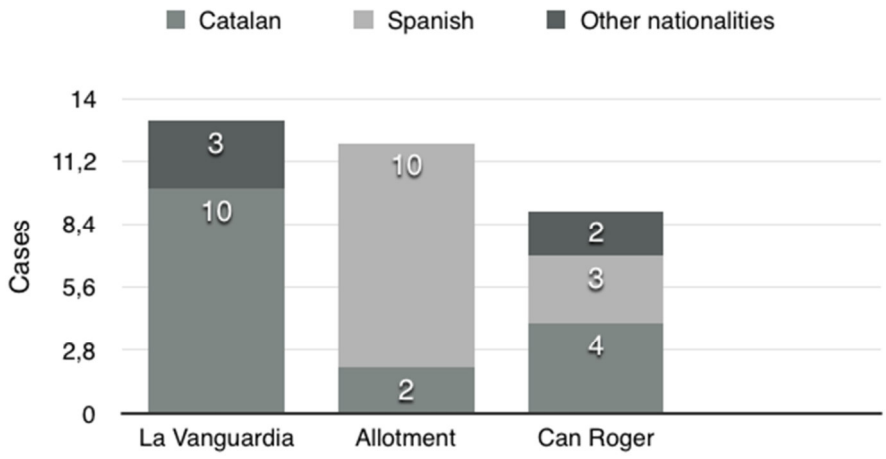
Age distribution among the gardens

	20-40	**40-63**	**63 <**	**Total**
	n.	n.	n.	n.
Community	7	5	1	13
Allotment	0	0	12	12
Pla Buits	0	7	2	9
Total	7	12	15	34

Most of the people interviewed received a university education (15); they represent the majority in Can Roger and La Vanguardia; on the other hand most of the allotment gardeners received a primary education. The sample includes 13 Spanish outside Catalonia 16 Catalan and 5 from other countries. The majority of La Vanguardia gardeners (10 out of 13) are Catalan while in the allotment gardeners 10 out of 12 interviewees are Spanish.

Graphic 1

Nationalities distribution



The respondents' political orientation was collected through a scale from 0 (extreme left) to 10 (extreme right). The average score for each type of garden are 2,3 (La Vanguardia), 3,6 (Can Roger) and 4,5 for the two allotment gardens.

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Motivations

From a general perspective the results show the prevalence of Relational motivations (3,69) and Transmission (3,67), followed by Environmental (3,47) and Political (3,43) motivations, and Personal wellbeing motivations (2,23).

Table 6

Likert scale results on motivations

	La Vanguardia	***Can Roger***	***Allotment gardens***	***Total***
Personal wellbeing	**1,84**	**2**	**2,87**	**2,23**
Hobby	2,85	3	4.92	
Income	1	1	1	
Economic crisis	1	1,89	1,25	
Food security	2,54	2,11	4,33	
Environmental	**3,31**	**3,44**	**3,66**	**3,47**
Green spaces protection	3,85	3,78	3,67	
Negative externalities reduction	3,23	3,33	4,25	
Biodiversity	2,85	3,22	3,08	
Relational	**3,85**	**3,81**	**3,42**	**3,69**
Creation of relations	4,15	4,33	3,92	
Seeking for socio-cultural differences	4	3,89	2,92	
Comfortable environment	4,31	4,11	3,92	
Part of my traditions	2,96	2,94	2,92	
Knowledge exchange	**3,96**	**3,72**	**3,34**	**3,67**
Learn	4,30	3,66	3,41	
Teach	3,61	3,77	3.27	
Political	**3,81**	**3,56**	**2,92**	**3,43**
Decision making	3,58	3	2,75	
Actively increase UA diffusion	4	4,11	3,09	

As far as the differences in the motivations provided by the farmers are concerned La Vanguardia shows that the most important motivations are those related with knowledge transmission (3,96), while in Can Roger the relational motivations obtained the highest value (3,81); finally, in allotment gardens, the highest value was obtained by environmental motivations (3,66).

According to these data the main differences between the gardens typologies involve *personal wellbeing* and *political motivations*. The importance of Personal motivations amount on average to 2,87 in the allotment gardeners, 2,0 in Can Roger and 1,84 in La Vanguardia. Looking at the singular motivations of this category "hobby" was valued as the most important for allotment gardeners (4,92), while in other gardens it obtained a lower score: 2,85 in La Vanguardia and 3 in Can Roger. A similar trend emerged in relation to "food security", which showed the highest score in the allotment gardeners (4,33) followed by La Vanguardia (2,54) and Can Roger (2,11). Regarding political motivations' implication in decision making and active participation for UA diffusion obtained the highest value in La Vanguardia (3,81), followed by Can Roger (3,56) and allotment gardens (2,92).

Garden accessibility

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The importance given to the three indicators of garden accessibility differs among the gardens. Safety from theft and vandalism has been evaluated 4,58 in allotment gardens while it was considered as a less important requirement for garden accessibility in La Vanguardia (1,85) and Can Roger (3,11). Closeness was evaluated between quite important (4) and very important (5) in La Vanguardia (4,38) and allotment gardens (4,67), Can Roger users gave to closeness a lower value (3,89). Inputs provision was considered a more important requirement by Can Roger (3.01) and allotment gardens users (3,17) than by La Vanguardia ones (2,31).

Table 7
Likert scale results on accessibility

	La Vanguardia	***Can Roger***	***Allotment gardens***	***Total***
Safety from theft and vandalism	1,85	3,11	4,58	3,18
Closeness	4,38	3,89	4,67	4,31
Inputs (tools, seeds, water, soil)	2,31	3,01	3,17	3,01

4. Discussion

Differences between gardeners' perception of motivations

The results show the existence of differences in terms of motivations between different vegetable gardens, supporting other studies' findings (Calvet-Mir et al.; 2016). Nevertheless each motivation shows different visions among the farmers interviewed according to the contexts examined. Qualitative data have highlighted these differences and their analysis supported the Likert scale scores' interpretation.

The perception of personal wellbeing motivations differs depending on the level of the perceived impact that urban gardening has on the community. In Gardens like La Vanguardia and Can Roger the users' missions are more oriented towards satisfying the community's needs (prevalent social-ideological orientation). Urban gardeners from Can Roger do not perceive the garden as a leisure activity since they are involved in providing food security to vulnerable people through the soup kitchen. Similar to Can Roger, La Vanguardia urban gardeners perceive the garden as an activity embedded in the community structure and dynamics, but with a different focus. According to the La Vanguardia activists the garden is mainly aiming at contrasting the massive touristic conversion that Poblenou is facing in the latest years and has little to do with food sovereignty or security. On the other hand the allotment gardens activity shows a more individualistic nature, which is reflected also on the importance given to plot safety (4,58). According to what emerged from the interviews, allotment gardeners are careful about the safety of their work and "food security" influences (4,33) their participation. As a consequence in allotment gardens environmental motivation like "reduction of negative externalities" obtain a high score (4,25) since, according to interviewee, externalities reduction is not only related with food environmental impact but also with having a tighter control on the origin (in this case their own cultivation) of the food they consume. The reduction of externalities in the other two typologies is referred to social externalities related with food production. It was valued as a less affective factor (3,23 La Vanguardia; 3,33 Can Roger) since singular UA activities is not perceived as having a significant impact on these type of externalities.

Differences are observed also in relational motivations; relations with other individuals affect La Vanguardia activists and Can Roger's. People living in the same neighbourhood, that have never met each other, could extend their social relations network adding value to the gardening activity. For allotment gardeners UA is a way to reconnect with traditional activities of their native places, especially for Spanish migrated from rural areas, which, according to the coordinators of allotment gardens network, represent the majority of the allotment gardeners.

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Drivers influencing different UA typologies identification and the stakeholders' roles

Vegetable garden users are willing to participate to UA activities that better fit their needs, and behaviours (Calvet-Mir et al, 2016; Nisbet at al, 2009); consequently the gardeners' profiles and garden's management are defined by different drivers. The vegetable garden characteristics are influenced by the drivers that led to their creation: Can Roger, started from a local government initiative with a high involvement of citizens; while a bottom-up initiative with no involvement of local government characterised La Vanguardia. These drivers involve the socio-economic emergencies (abandoned farms, state of abandon of public spaces related to building crisis) in the case of the socially-community oriented initiatives, while more individualistic food safety/leisure oriented users were attracted by the less socially and politically oriented motivations which led to the creation of the allotment gardens.
Thus local governments and civil society play different roles in shaping the various types of UA structure and influencing their missions and development strategies fulfilment. In particular when considering the allotment gardens, the local administration is the one that mainly decides for the gardens regulation, in Can Roger garden's volunteers and local administration share the management on a more equal base, while in La Vanguardia the garden management is mostly in the hands of the civil society (the gardeners). This also emerges from the data regarding the Political motivations like the willingness of actively increase the diffusion of UA through the activity: la Vanguardia activists (4) and Can Roger (4,11) volunteer were more influenced by the willingness of actively increase UA in Barcelona than the allotment gardeners (3,09).

Table 8
Garden's characteristics

La Vanguardia		
Drivers - Gentrification (derived from urban policies) - State of abandon - Political; Knowledge exchange	**"Gardeners' Profiles"** - Political activists - Neighbourhood inhabitants - Students - Catalan	**Garden's managers:** Gardeners
Can Roger		
Drivers - Building crisis and state of abandon - Local policies - Local associations' consortium - Social relations	**"Gardeners' Profiles"** - Volunteers from associations' consortium - Neighbourhood inhabitants	**Garden's managers:** Gardeners > local administration
Can Mestres; Can Cadena		
Drivers - National and local policies - Space availability - Environmental; food control	**"Gardeners' Profiles"** - Retired people - Most of them male migrated from Spanish rural areas	**Garden's managers:** Local administration

5. Conclusions

The aim of the work was to provide an analytical approach useful in creating a knowledge base for policies definition related with UA in Barcelona. To this end the focus of the work was the assessment of differences in motivation, needs and gardeners' characteristics related to their participation to UA. The present study broadened the theoretical approach by underlying how the different users perceive the

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vegetable gardens. The analytical framework enables local stakeholders to widen their possible strategies for UA development and in particular policy makers could derive strategies better fitting the context's characteristics. The results on drivers and gardeners profiles exemplify the definition of UA policies that better involve different actors by following a horizontal subsidiarity relation. The results showed that possible strategies aiming at increasing the participation to UA should aim at involve younger users between 20 and 40 years by planning a social-oriented and highly participative approach similar to what emerged in La Vanguardia. Strategies addressed to the valorisation of Allotment gardens projects, mainly involving older and more conservative users, should focus on the garden as a safe place in which one can have access to his own food without risks. A space whose goal is to sustain the community through UA should follow the drivers and motivation that influenced gardeners from Can Roger (Relational motivations, Knowledge transmission, Support to the community). Further research improvements emerged in particular as far as increasing the sample size in order to allow for an ANOVA analysis of the differences between the gardens, is concerned. A second limitation is related to the possible over-valuation of some motivations, as other studies highlighted (Calvet-Mir et al., 2012; Camps-Calvet et al, 2016). Positive statements like "increase biodiversity" can be over-valuated as a motivation due to a possible respondents' *desirability bias*. Finally the range of UA typologies should be broadened since the analysed cases do not represent the whole existing typologies especially when considering less standardised gardens like Pla Buits and community gardens.

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Appendix 1

Cuestionario

A. Las siguientes preguntas consideran su participación en actividades de agricultura urbana y peri-urbana

1. ¿Desde cuándo participa en estas actividades? Algunas semanas Menos de 6 meses Más de 6 meses Más de un año Más de 3 años
2. De media, ¿cuántas horas dedica a la semana?:…….horas
3. ¿Empezó su actividad con otras personas? Número:
4. Extensión de la parcela

B. Ahora, evalúe en qué medida las siguientes motivaciones han influenciado su participación en las actividades: **1= Algo; 2= Poco; 3= Normal; 4= Bastante; 5= Mucho**

Personal					
- Hobby	1	2	3	4	5
- Mejora salarial a través de su venta	1	2	3	4	5
- Influenciado por la crisis económica	1	2	3	4	5
- Incrementa mi seguridad alimentar	1	2	3	4	5
Ambiental					
- Protección del verde	1	2	3	4	5
- reducción de externalidades negativas	1	2	3	4	5
- Incrementa Biodiversidad	1	2	3	4	5
Relacional					
- Creación de una red de relaciones	1	2	3	4	5
- Entorno con diferencias socioculturales	1	2	3	4	5
- Entorno familiar	1	2	3	4	5

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- *Es parte de mis tradiciones*	1	2	3	4	5
Intercambio de conocimientos					
- Me permite aprender	1	2	3	4	5
- Me permite transmitir	1	2	3	4	5
Política					
- Ser implicado en el proceso de toma de decisiones	1	2	3	4	5
- Aumentar activamente la difusión	1	2	3	4	5

C. Cuanto los siguiente aspectos son importante para seguir la actividad

Usabilidad					
- Es una actividad segura frente al robo y vandalismo	1	2	3	4	5
- Cercanía	1	2	3	4	5
- acceso a medios de producción (semillas, herramientas)	1	2	3	4	5

D. Informaciones personales

1. Género: M F
2. ¿Cuál es su ocupación? Empresario; Asalariado; Profesional; Emprendedor; Parado con prestación; Parado sin prestación
3. Nivel de renta: 0 – 10.000 € anuales; 10.000 – 20.000 € anuales; 20.000 – 40.000 € anuales; Más de 40.000 € anuales
4. Edad
5. Educación: Primaria; Secundaria; Formación profesional; Formación Universitaria
6. Orientación política o ideológica: En una escala de 0 a 10 entre el 0 (muy a la izquierda) y el 10 (muy a la derecha) ¿dónde se situaría usted ideológicamente?

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