

Urban Agriculture in the Metropolitan Area of Santiago de Chile

An Environmental Instrument to Create a Sustainable Urban Model

LETICIA ROUBELAT MARQUES¹, GABRIELA ARMIJO PLAZA²

¹ Architecture student at Escuela Técnica Superior de Arquitectura de Madrid, Universidad Politécnica, Madrid, España.

² MSc.Arch, Director of Bioclimatic Laboratory, Universidad Central de Chile, Santiago de Chile, Chile

ABSTRACT: Currently, the city of Santiago de Chile represents an example of the rapid and expansive development experienced by capitals of developing countries. If Santiago's urban model should be classified, the balance tips towards the dispersed city model, characterized by consuming large amounts of resources faster than it can produce them. This paper explores the possible implementation strategies of urban agriculture in Santiago de Chile, related to urban policies and regulations. Urban agriculture is part of the toolkit that enable sustainable social and environmental growth, as well as ecological rehabilitation of cities.

Keywords: Key words: urban agriculture, urban planning, and regulations.

INTRODUCTION

The economic globalization concentrates its power in specific cities, those where financial centres and communications are centralized. These megalopolis demand such an expansive and vast development that consequently an excessive and non-planned use of land takes place. The path followed by Chilean economy includes this expansive growth. The constant and extreme transformation of the Metropolitan Area of Santiago de Chile has excluded productive agriculture and the rural population from urban planning. Despite this fact agriculture can be found in suburban areas and vacant lots in urban contexts. Thus, it is proved that rural life is not restricted to the provinces, a mixed view of the problem is starting to emerge: urban agriculture.

Furthermore, this leads to the question of the lack of legislation over those plots threatened by urban growth. There exists the possibility of incorporating their productive aspect in the green areas, ensuring their permanence in time, and the compliance with a series of rights and duties by both users and the institutions in charge. The following international precedents represent possible strategies that could achieve this goal.

LEGISLATION IN EUROPE: CASE STUDIES, LONDON AND BERLIN: ALLOTMENTS AND KLEINGARTEN

Allotments, kleingarten have the following similar characteristics [1, 2, 3, 4, 5, 6]; they are located on municipal land; local authorities are responsible for

infrastructure (water and access) and maintenance of allotment gardens; the cultivation of fruits and vegetables is permitted only for self-consumption; it is forbidden to stay overnight; and the plot size is relatively small, 100m²-300m² in London and 200-400 m² in Berlin. The main difference between the two is related to tenancy contracts. In Berlin the tenancy contract is between the local authorities and an allotment association, whereas in London it is directly between the local authority and the allotment holder.

Urban management plans regulate land-use at a local scale. In London allotments [1, 3] are recognized by the regulatory instrument "The London Plan." In this document they are classified as "green areas." This recognition protects the site from being redesignated for another land-use. If a change of land-use is considered absolutely necessary, the site must be replaced for another one with an equal or higher quality and size. As such the local authorities' statutory obligations provide a high protection to this land-use. Different metropolitan and local government strategies emphasize the importance of increasing the number of community and individual allotments, through measures such as changing temporary sites into statutory sites. In Berlin Kleingarten and Shebengarten [5, 6] are recognized both the Regional Urban Plan, and Local Development Plans. Between them these plans include 85% of existing kleingarten. However the permanence of a kleingarten can only be preserved through inclusion in the Local Development Plans, as the Regional Urban Plan is not legally binding to private owners.

The locations of both allotments and kleingarten [4, 6] show that urban agriculture is an activity present at every urban scale. In London there are allotments in 29 of the

32 metropolitan boroughs (The City and Westminster are excluded by law from the obligation to provide allotments). In Berlin *kleingarten* exist in every district. On average in London the allotment space per inhabitant is of 1.4 spaces every 10.000 inhabitants, less than half that of Berlin which provides 3 spaces every 10.000 inhabitants. In both London and Berlin a higher number of allotments are located in the outer districts. In London three of these outer metropolitan boroughs have more than 40 sites; in comparison Berlin has 2 districts with more than 100 sites. In the central districts the number and size of sites decrease. In Inner London 3 districts have no sites and 6 have less than 10 sites. In Berlin the district with the least sites is Friedrichshain Kreuzberg with only 4, followed by Mitte with 27 sites.

THE RURAL-URBAN INTERFACE IN THE METROPOLITAN AREA OF SANTIAGO DE CHILE

Santiago's metropolitan area is territorially characterized by a constant disperse and discontinuous expansion. This expansion goes beyond its own limits forming a polycentric structure with mobile borders. These are also marked by the appearance of so called globalization urban artefacts (shopping malls, large specialized retail spaces, etc.) that have an important role as structuring elements of urban environment, its landscape and image [7, 8]. The urban expansion subsumes a growing number of existing surrounding urban areas, and occupies in a partial or incomplete way the remnant rural areas between. These remnants become a complex mixture of rural and urban, in other words, hybrid spaces. Consequently the boundary between rural and urban becomes blurred, though the urban lifestyles generally end up imposing themselves [7, 8].

The hope of thousands of families to achieve better living conditions by migrating from country to cities disappears quickly. Instead in reality what they find is no work, major limitations in the provision of basic social services and high costs in the value of land and urban housing. As a consequence for their survival, an important fraction of this population has chosen to seek alternatives. The deep-rooted customs and traditions of rural families superimposed on the urban environment developing, among other activities, agriculture practices similar to those previously performed in their rural homes. This knowledge is transferred from parents to children; often continuing this practice not only for self-sufficiency, but above all because of a cultural heritage, a tradition with which they were raised [9]. Historically as a result of the new environmental conditions, the traditions and customs previously mentioned were

displaced to small urban areas, lots, gardens, terraces and roofs. Even surplus areas and poor soils peripheral land has become used for small gardens where fruit and vegetables are grown and raising livestock. Today these are the ones who continue informally to carry out Urban and suburban Agriculture [9].

PARLIAMENTARY ACT 6815: ALLOTMENTS AND GARDENS FOR WORKERS AND FAMILIES

The government project the "Worker and Family Allotments and Gardens Act" was put forward on the 4th March 1929 and passed on the 5th February 1941. [13] It was legislated by the government's institution Popular Housing Fund [10], whose functions are nowadays performed by SERVIU (Regional Service of Housing and Urbanism) dependent of MINVU (National Ministry of Housing and Urbanism). The last update of the act was on the 8th January 1960. The act covers sites between 500m²-5000m² and recommends their location in urban and surrounding areas. Land use is defined as residential and first need production. It has to be noted, that the allotment as a land use was not mentioned in urban planning regulations at the time. The production is assumed to be destined for household consumption but allows for and actively encourages household industries. The common facilities including education, sports and culture are financed by the government at no cost to the tenants or owners. The common services such as sewers, drinking water, lighting etc. will be assumed by the government at no cost to the tenants. However many important details of these services are not specified, these including water supply for irrigation, drainage provision, energy supply, interior division fences, building type and maximum building area.

If it is to be a community allotment, the owners or tenants must organize themselves in a cooperative for allotment garden operations. This rule is also applies to individuals, as long as their salary is not less than a worker or that of an employees. During the first five years, an agricultural engineer, technicians and specialists are to be assigned to provide technical assistance. After these five years only the agronomist remains.

Payment is made in installments. When 20% of the total price of land has been paid allotment holders receive contractual ownership, until then they are considered as tenants. Sites can only be subdivided following the final payment of the total price of the land.

WORKER AND FAMILY ALLOTMENTS, LA PINTANA, SANTIAGO DE CHILE [11, 12]

An existing example of the government program described above is the residential complex “Poblacion Modelo de la Pintana” (Model Village of La Pintana) located in a southern district of Santiago de Chile. This example is of particular interest due to its particular structure and organization. Today its spaces have been transformed into a peripheral urban area, and are simultaneously subjected to pressures coming from the city expansion and the agricultural modernization.

The human settlement in the area of La Pintana dates from the early nineteenth century, as a result of the construction of San Carlos irrigation canal system (1821). In the late nineteenth century, an urban settlement was born in the area of Santa Rosa Avenue, which still remains as the backbone of the southern sector of the city. Indeed the borough of La Pintana only belongs to the suburban area of Santiago since the 1980s. At the time, in response to the demographic increase in the city, new policies were tested and new territorial administrative partitions were defined. Since 1981, the administrative area of La Granja was split and La Pintana was founded.

The government project “Workers and Family Allotments and Gardens”, was influential in the development of this district. The project began in a difficult historical period following the earthquake of 1939. The chosen area was located at the southern end of the alluvial plain of the river Maipo. It was considered a suitable area because it was scarcely inhabited and already had irrigation systems, so resettlements and a higher density occupation of this area was allowed.

According to the law of the Popular Housing Fund, agricultural activities should financially support each family and allow the payments of the debt owed to the Fund. The first stage began in 1956, and the following in 1950 and 1956. The first cooperative was Jose Maza, followed by Mapuhue and Las Rosas, these continue to exist. Together they form a residential complex of 500 sites of one acre for agricultural activities, a three bedroom house, some community services and home industries. The 20% of the land destined to agricultural activities was used for social and cultural facilities. As defined by the parliamentary act the community services as well as urban infrastructure (squares, streets, potable water, etc.) were provided by the government at no additional cost to the purchasers. Technical assistance was provided for the mandatory 5 years, following this period, only the engineer and a minimum monitoring service persisted, until the payment of the final debt owed to the Fund. From the 1980s onwards the demographic

increase and the urban densification affected the agricultural potential of the district, causing a deterioration of the urban conditions of the areas previously occupied.

Currently the Población Modelo de La Pintana, though surrounded by private neighbourhoods still remains, thanks to its design, structure and the persistence of the communities in being organized as a cooperative. Agreement between the inhabitants of the neighbourhood continues to enforce the prohibition of subdividing sites or incorporating industrial productive activities that are considered harming or non-compatible with house industries or residential areas. However development on surrounding sites is beyond their control and barb-wired fences and high walls mark their boundaries.

URBAN AND SUBURBAN ALLOTMENTS IN THE URBAN POLICY FRAMEWORK OF THE METROPOLITAN AREA OF SANTIAGO DE CHILE

Among the different urban land-use definitions included in the Chilean Building Regulation: Ordenanza General de Urbanismo y Construcciones (O.G.U.C) there is no explicit definition for allotments [13]. Nevertheless, the definition “Green Area” allows its possible inclusion, thereby making easier the protection against land-use changes. Theoretically land classified as Green Area does not give the possibility of changing land-use. In addition the obligation of providing land for Green Areas in new construction projects is becoming more frequent. This enables the implementation of urban and suburban allotments in a large number of interventions. The definitions of Green Area and Public Green Area included in the O.G.U.C. Chapter 1 are: “*Green Area: land area intended for recreation or preferentially pedestrian circulation, usually composed by plants and other accessories*” and “*Public Green Area: national property of public use that has the same features as Green Areas*” [13].

With regard to subdivisions of rural land, outside the established urban area, according to the Article 55 of the O.G.U.C [13], the subdivision of agricultural and forestry properties allowed up to minimum size of 0.5 hectares. Land-use changes are also allowed with houses for land owners and workers and social housing developments being permitted among other examples. As a consequence, a high percentage of 0.5 hectares plots have been subdivided and transformed into gated communities. Those who commercialize this type of urban developments call them “Pleasure Plots” (parcelas de

agrado). These have multiplied during the years giving large profits to owners of vast land extensions.

The Metropolitan Masterplan Plan, the Plan Regulador Metropolitano de Santiago (PRMS) [14], includes the definition of nature conservation and agroforestry development areas. However it establishes that these areas are excluded from urban development areas, thereby creating a void regarding the regulation of agriculture in urban and suburban areas. This fact keeps out urban and suburban allotments from the PRMS, as for proper functioning they should be associated with a residential area, as the location close to the house is an important requirement for adequate operation.

Furthermore, this master plan focuses its interest towards densification and generation of available land for social housing and infrastructure. Instead of working as a global project, it works through partial interventions, given the need to show citizens concrete actions. This represents an impediment for urban and suburban allotments. To exert real influence on a sustainable urban model, allotments cannot be considered as a specific or special issue, they have to be integrated in an urban agriculture plan that incorporates them in every scale [7].

The progressive incorporation of boroughs previously located on the edge of the urban limit and the speed of metropolitan expansion has led to a fragmented occupation of the urban-rural interface generating hybrid suburban areas, a considerable loss of valuable agricultural land and the gradual degradation of these areas before related to rural life [7, 8].

An urban planning instrument that can be useful for the incorporation of urban allotments into urban regulations of the Metropolitan Area of Santiago, are the ADUC (Conditioned Urban Development Areas) [15]. These areas combine housing projects with green and common areas. This model of land management operates to improve regional and local conditions for planning urban sprawl. It sets conditions for urban expansion to achieve higher urban standards providing a guide for urban development and real estate projects through greater obligations to mitigate the environmental and urban impacts.

The A.D.U.Cs [15] apply to urban planning for new construction urban areas where private initiatives are proposed, in other words, real estate projects. They are approved by the municipality or local government and are regulated by Regional and Intercommunal Plans. The regulations define that Borough Councils cannot provide construction permits if the requirements and mitigations

at each stage of the project are not complied. These requirements include obligatory percentages of land-use: 3% for municipal facilities, 7% for Green Areas, 10% for community facilities and parks.

What is of particular interests about this instrument is the part related to the transfer of land for parks and facilities. The obligation to include these types of land-use in project from the start ensures a prescribed amount of public space and an organization of its distribution. It also could enable the implementation of urban allotments in the Green Areas, and since this area is destined to be municipal land, the local government will assume the costs of urbanization. It also ensures the combination of the allotments with public services, which improves their performance and allows having space for environmental education associated with them. Despite all these advantages, this urban instrument does not mention location or quality of facilities and Green Areas. However, if these details are set by the municipality urban agriculture could be included in a market that is attractive to private investment, in other words, for most of the initiatives involving urban space in the metropolitan area.

VILLA 4 ALAMOS ECOBARRIO.

It is often assumed with “green developments” that the relationships and social networks will emerge from a physical configuration and a variety of building types. This may be true, but the process is slow, the inhabitants of these new districts are people without a common history and references that give a sense of community. On the contrary, in the redevelopment and adaptation of historical neighbourhoods a social complexity and a shared identity already exist, and are both keys for community action, as in this example, La Villa 4 Alamos Ecobarrio (Eco-neighbourhood) in the district of Maipú, Santiago de Chile.

At the moment the project is in the first stage of development through both private and public funds. They have already built community facilities, an active neighbourhood association and the most important a Demonstration Center of Alternative Energy and Environmental Education consisting of recycling containers for glass bottles, plastic bottles, cans, and batteries, a compost maker and compost bioreactor, a greenhouse, a solar oven for cooking and a community allotment [17].

This urban organization responds to an environmental management model that allows the revitalization of the public space of Villa 4 Alamos, allowing the

incorporation of certain practices that promote environmental education for their inhabitants [17].

DIGA LA PINTANA (DIRECCION DE GESTION AMBIENTAL) THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, LA PINTANA

The environmental management institution in the Municipality of La Pintana was created to promote sustainable development in the district, and implement arising actions from municipal policies. It is a precursory strategy of environmental care and citizen participation. With a team of professionals, volunteers and residents of the district, projects with low economic cost and high citizen impact have been developed. Not only have they contributed to the decontamination of the district, but also with urban recycling practices, and the incorporation of an organic landscaping in homes and public spaces [18].

In November 2010, the author visited the facilities of the institution with the project director Manuel Valencia. Among the department's projects, there is an educational allotment module. This module shows three possibilities in a patch of land the size of the average gardens of the detached or semi-detached houses of the district. These are a greenhouse, a classic allotment on the ground and a vertical allotment. Their proposals emphasize the recycling of all types of materials existing in their households (yogurt cartons, plastic bottles, juice bottles, etc.). The system aims to teach those interested using this demonstration module and then the team makes a visit adapting the three proposals to the available space in the house, patio, porches, vacant lots, playgrounds in neighbourhood associations, schools, etc. The allotment module is run by a qualified eco-agronomist. The neighbours interested in carrying out this practice in their homes, are provided with humus, compost and seedlings during the first year, and after that period only humus and compost.

These projects are conducted jointly with the Council's Ecological Community of La Pintana, and neighbourhood association Villa Las Rosas among other social and community environmental organizations [18].

CONCLUSION

In order to protect existing allotment gardens and increase their number, legal coverage given by law and their effective recognition of land-use by international regulations is necessary. Despite their legal recognition, urban agriculture is threatened by urban development pressures, especially in central city areas. In addition,

relocations in remote areas are quite common, hampering user's accessibility.

While it is true that since the mid twentieth century the tendency of urban agriculture plots is decreasing, a turning point may be occurring. New projects are arising, and the existing ones are reinforced as a result of a greater environmental conscience of society, the interest in healthy and locally produced products, the opportunity for cooperation on initiatives related to health, education, biodiversity, social inclusion, etc.

Although the city of Santiago de Chile represents an example of the rapid and expansive development, there is a cultural inheritance regarding the growing of food crops arising from rural migration. This tradition can be seen in the cultivation of any available spaces no matter how precarious it might be. Furthermore, there exists a former government program, and several community initiatives that promote urban agriculture in Santiago.

References to urban allotments in the current urban regulations are non-existent. But there are still some open doors within the urban planning instruments. Its inclusion as a productive green area can be possible, thus ensuring its permanence in time and its regulation, by belonging to a land-use covered by the Chilean Building Regulation, the O.G.U.C. A planning instrument that might be useful is the ADUC. The problem is that neither location nor quality of facilities and green areas are defined.

For the development and improvement of these and other related activities, urban agriculture must be considered a land classification in urban planning regulations, to ensure its continuance and effective management. To exert real influence on a sustainable urban model, allotments cannot be considered as a specific or special issue, they have to be integrated in an urban agriculture plan that incorporates them in every scale. The author therefore proposes a recovery of the existing dormant parliamentary act 6815.

AUTHOR'S PROPOSAL FOR THE RECOVERY OF THE PARLIMENTARY ACT 6815: WORKER AND FAMILY ALLOTMENTS

- Land-use: productive green area, included in O.G.U.C
- Size: 100-250 m² (individual sites), less than 5000m² (community allotments)
- Recommended location: urban and suburban areas.
- Principal land-use: residential and production to cover primary needs.

- Destination of production: household consumption, with the possibility of selling surplus in informal or local markets.
- Water supply for irrigation: water supply for each site, from potable water network or treated waste water.
- Drainage system: Separation of grey water and effluent.
- Energy supply: autonomous system of renewable energy.
- Material supply: compost and seedlings will be provided by the public institution in charge for the first year.
- Interior site fences: only with plants.
- Building type in allotments: assisted self-construction for built elements within the allotment site (storage shed, summer house).
- Maximum building area: less than 10m².
- Common use facilities: all facilities (education, sports, culture) to be financed by the local government at no cost to the tenants or owners.
- Urban development: all development costs (streets, squares, buildings for common service facilities, drainage, drinking water, lighting ... etc.) to be assumed by the government at no cost to the acquirers.
- Initiative: if it is a communitarian allotment, the owners or tenants must be organized in a cooperative for allotment garden operations.
- Promotion and control of performance: local government institutions.
- Technical assistance: during the first five years, an agricultural engineer, technicians and specialists are assigned. After five years only the agronomist to remain.
- Transfer or subdivision of sites: forbidden subdivision, if a transfer has to be made, the allotment holder has to consult the rest of the association, and the new allotment holder has to continue with the same activity.

REFERENCES

1. The London Plan. Spatial Development Strategy for Greater London. (July 2011). [Online], Available: <http://www.london.gov.uk>. [12 April 2012].
2. LONDON allotments, [Online], Available: <http://www.london.gov.uk/allotments/>. [12 April 2012].
3. Harding, J., Internship Student, Kings College London, (2004). Implications and Opportunities for Allotments: Arising from the Mayor London's Strategies. *A report for: The Greater London allotments Forum (GLAF)*, [Online], Available: <http://www.londonallotments.net/research/jh001.html>. [12 April 2012].
4. London Assembly, Environmental Committee, (2006). A lot to Lose: London's Disappearing Allotments, [Online], Available: <http://www.london.gov.uk/who-runs-london/the-london-assembly/publications/health/lot-lose-londons-disappearing-allotments>. [12 April 2012].
5. Drescher, A.W., (2001). The German Allotment Gardens: a Model for Poverty Alleviation and Food Security in Southern African Cities? *Published in the Proceedings of the Sub-Regional Expert Meeting on Urban Horticulture, Stellenbosch, South Africa, January 15 - 19, 2001, FAO/University of Stellenbosch, 2001*, [Online], Available: <http://www.cityfarmer.org/germanAllot.html>. [17 April 2012].
6. Groening, G., (1996). Politics of Community Gardening in Germany. *Paper presented at the 1996 Annual Conference of the American Community Gardening Association (ACGA) "Branching Out: Linking Communities Through Gardening" September 26 - 29, 1996, Montréal, Canada*, [Online], Available: <http://www.cityfarmer.org/german99.html#developerman>. [17 April 2012].
7. De Mattos, C.A., (2002). Santiago de Chile de cara a la globalización, ¿otra ciudad? *Pontificia Universidad Católica, Revista de sociología y política N° 19: 31-54 NOV. 2002*.
8. Dematteis, G., (1996). Suburbanización y periurbanización. Ciudades anglosajonas y ciudades Latinas. *La ciudad dispersa, Urbanitas 4*. [17 April 2012].
9. Sánchez, L.M., La forma urbana de la agricultura, [Online], Available: <http://masd.unbosque.edu.co/descargas/>. [19 April 2012].
10. Ley 6 815: huertos y jardines obreros y familiares. *Biblioteca del Congreso Nacional de Chile*, [Online], Available: <http://www.bcn.cl>. [19 April 2012].
11. Gurovich Weisman, A., (2007). El proyecto como metáfora: la ética de la sustentabilidad en el discurso urbanístico de la experiencia chilena (1835-1958). *Ciudades para un futuro más sostenible*, [Online], Available: <http://habitat.aq.upm.es/boletin/n42/ab-agur.html>. [23 April 2012].
12. Gurovich Weisman, A., (2002). Conjugando los tiempos del verbo idealizar: los huertos obreros y familiares en La Pintana, Santiago de Chile. *Pp. 59-70, Art. en Rev. Cuadernos del CENDES. Caracas: Centro de Estudios del Desarrollo, Universidad Central de Venezuela*, [Online], Available: <http://www.scielo.org.ve/>. [23 April 2012].
14. Ordenanza de Urbanismo y Construcción (O.G.U.C). (2011). *Ministerio de Vivienda y Urbanismo (MINVU)*, [Online], Available: http://www.minvu.cl/opensite_20070404173759.aspx
15. Plan Regulador Metropolitano de Santiago, (PRMS), (2008), *Chapters 1, 2, Ministerio de Vivienda y Urbanismo (MINVU)*, [Online], Available: http://www.minvu.cl/opensite_20080421111026.aspx. [23 April 2012].
16. Instrumentos de Planificación Urbana Condicionada, (2009). *Ministerio de Vivienda y urbanismo*, [Online], Available: http://www.slidefinder.net/m/minvu_20instrumentos_16de_20urbanizacion_20condicionada/minvuinstrumentosdeurbanizacioncondicionada/3704346 [25 April 2012].
17. Centro Cultural, Social y del Medio Ambiente el Ceibo. 2006-2008, Creando el primer eco-barrio de Chile, [Online], Available: <http://www.territoriochile.cl/1516/article-76257.html>. [25 April 2012].

18. DIGA: Direccion de Gestion Ambiental de La Pintana,
[Online], Available: <http://www.digap.cl/wpress>. [27 April
2012].