"Urban versus rural" no longer matches reality: an early public agro-residential development in periurban Santiago, Chile

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The paper discusses the validity of the "urban versus rural" dichotomy in scientific literature, statistics and urban planning practice, especially in empirical studies developed around the issue of vegetable and animal farming inside and around cities. Santiago's rural–urban interface is presented as a case study. Sample results extracted in early 2003 have shown that farming mixed with other land uses is even now a reality in Southern Santiago, supported in solidarity alliances and a characteristic life philosophy, giving researchers the possibility of exploring a living ecocity laboratory.

Keywords: Ecocity; urban farms; sustainability

Introduction

George (1983) wrote that the word "city" covers different realities even though they all share family traces. Accordingly, other French authors refer to cities instead of city (Pelletier and Delfante, 1989). Jones (1990) pointed out the most obvious thing about a city is its uniqueness whereas long ago Wirth (1938) had already rejected simple measurements and numerical definitions (Carter, 1975). Whichever criteria might be adopted to categorize them, cities are the meeting places to which people periodically return (Mayer, 1971), and to which nowadays more than half of humanity calls home. The conceptualisation of cities had an historical evolution together with city's growth and changing character. Max Weber contrasted Western and Eastern cities, the same way Marx and Engels opposed city and countryside. Lefebvre further improved their reasoning, constructing the centre-periphery model further schematised by Friedmann (Bettin, 1982). These dualistic proposals, based in conflicting interests between cultures, means of production and social classes, still pose theoretical limitations to some orthodox geographers and urban planners, as the process of urbanization became far too complex, forcing us reconsider land-use models, functional theories and urban form criteria, because reality no longer matches theory.

Change started in the 20th century (Johnson, 1974), distorting the urban versus rural depiction with concepts like *banlieue*, *rurbanisation*, *periurbanization*, and more recently the *rural–urban interface*. Starting with *banlieue*, the French word for suburb or urban fringe, it names peripheral lower pattern apartment blocks in Europe and middle, upper-middle-class single-family houses in the USA (Goitia, 1996). Actually, in Europe, suburbanization is characterised by multiple-family housing as well as undesired economic activities (noisy, pollutant, space compelling, less competitive, etc.). Banlieues are settings where public and private spaces ooze into each other, located around congested agglomerations or polarized cities. The phenomenon has in general a poor connotation, an exception made to the Anglo-American garden suburbs movement of the 1920s and French quality suburbs (*banlieue de charme*), a specific subtype (Boyce, 1971; Bourne, 1971; Johnson, 1974; Capel, 1975; Ellin, 1996).

Unlike suburbanization, in *rurbanisation* rural and urban spaces are intertwined. Houses might be

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isolated, organised in condominiums or new villages. This notion started being used by French geographers in the 1970s and main characteristics are: (1) subsistence of a non-urbanized space between new settings, urbanized lots or alien architecture and the oldest core city nearby; (2) persistence of typically rural activities and buildings in the vicinity of modern city-like housing projects; (3) intensive single-house construction in areas less than 30 min distant from the city; (4) decrease of farmers and artisans, in the demographic economic structure; (5) land use differentiation and increasing land costs due to housing (Bauer and Roux, 1976).

Rurbanisation had limited use in the scientific literature whilst isolated residential areas in rural realms were soon rare, for new residents had new needs, opening windows of opportunity to almost any economic activity and occupation that shortly relocated near the urbanized plots. That is when the concept shifted into *periurbanization*, although Anglo-American authors rarely adopted the expression or were rather critical (Johnson, 1974; Carter, 1975). Periurbanization is associated with the automobile, with route and highway expansion, to time–cost and time–distance improvement, also confrontation with rural and natural realms, to sacrifice of time in commuting to the distant workplace.

Ecological planning, renewed in the late 1960s and largely influenced in the United States by Rachel Carson's *Silent Spring*, gave impetus to a pacific coexistence between architecture and ecology, later evolving into environmentalism and current sustainable cities concerns, after the UN Brundtland Report (1987). One must recall that in the earlier suburban conception, cities evolved continuously, swallowing peripheral ring areas, mostly rural. On the contrary, *periurbanization* has a diffuse and multidirectional character, being more complex as it involves and integrates almost all typical urban functions like housing, light industry, high technology industries and services, big malls, plus agriculture, livestock, forests, pastures, parks and nature reserves. Above all, periurbanization is inclusive, discontinuous in shape and multi-functional (Tenedório, 1998; Iaquinta and Drescher, 2000; Bourne, 2001).

In spite of evidence of a globalizing world, regional planning still considers rural and urban development as distinctive, economically independent, and governments divide planning into separate bureaus. The need to overcome such a dichotomy led to a United Nations movement, towards including rural–urban relationships of economic interdependence and environmental sustainability in a connected entity. More recently, social scientists, economists, architects and urban planners have been compelled to work together in the *rural–urban interface* concept, seen as the interaction between the two spheres and an explicit acceptance of spatial coexistence of both. Worries are the necessity to feed and water supply the rising numbers of people that arrive in the cities every day, and also the need to find the best solutions to integrate complementary realms in order to ameliorate policies and governance (Brook and Dávila, 2000; Madaleno *et al.*, 2002; Nuppenau, 2002).

The concept of urban agriculture

Urban agriculture is food production occurring in cities for citizens, and it includes animal grazing as well as vegetable gardens. It straddles formal and informal sectors. Due to the changing pattern of city life and to urban diffusion processes, formal periurban farms are integrated in the concept. A definition offered by the UN Development Programme is: "an industry that produces and markets food and fuel, largely in response to the daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and periurban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock" (UNDP, 1996: p 3).

Mumford pointed out that in both the Near East in ancient times and in Western Europe in the Middle Ages, cities prudently retained some portion of the land within their walls for gardens and the harbouring of animals for food in case of military siege (Mumford, 1956). Farming in city areas was though never abnormal or oxymoronic (Tinker, 1994). The rift between agriculture and the city only came after the industrial revolution, in the few countries that experienced it. Even then, furtherance of an opposition was questioned and utopia grew as a reaction against filthy and congested industrial cities, each and every one a remarkable attempt to harmonise man with nature and bucolic activities. Examples were drawn by Owen (1817), Fourier (1829), later on Soria (1882) and particularly Ebenezer Howard (1898) who founded the British garden-city movement (Terán, 1982; Rosenau, 1988; Goitia, 1996).

Moreover, if one uses a structural concept of urbanization, one easily concludes that activities performed and occupations evidenced by people living in the urban realm were not always completely recorded. In reality, historical data from several countries show that a non-depreciable number of people who have been settling for millennia in the so-called urban centres cultivate vegetable gardens and raise livestock. Yet, it was only late in the 20th century when gender studies started paying attention to private spaces that backyard food gardens, existent almost everywhere within the urban fabric, were made visible. Intra-urban agriculture was mostly a subsistence activity, vegetable cultivation and livestock being used to supplement

family diets while assigning women a more active role in the sustenance of the household and thus contributing to their sense of self-worth (Schilter, 1991; Slater, 2001).

New reports and recent research results prove household food gardens can also generate jobs and income, develop the local economy and alleviate poverty, besides improving family nutrition, family inclusion and integration. In addition, farming in city areas ameliorates air, soil, and climate quality as it beneficially contributes to genetic resources and water cycle preservation (UNDP, 1996; Bakker *et al.*, 2000; Santandreu *et al.*, 2002). Urban agriculture is more and more considered an integrated part of urban management and regulation of activities intended to give food security to less wealthy urbanites as well as income to micro-entrepreneurs, and is implemented by several international organizations and inter-municipal working groups, particularly in Latin America (Dubbeling, 2001). The assessment is that agricultural pursuits are rent-worthy, more profitable per space unit, and should be highly market-oriented inside city boundaries.

Enquiries, online news and scientific surveys have revealed examples of lucrative "zero grazing" and street rubbish-fed livestock such as dairy cattle in India, pigs in East Timor and India, poultry in Brazil and Kenya, sheep in Bolivia (Nunan, 2000; Bentinck, 2000; Kreinecker, 2000; Madaleno, 2001; Reuters *et al.*, 2002; Mireri, 2002). Rooftop gardening technologies are increasingly made available for interested urbanites from countries as disparate as Canada, Russia and Australia (Gavrilov, 1997; Wilson, 1999). Topical developments make detection of vegetable and animal farming within the urban fabric even more difficult, so in order to achieve better results technical studies have been using information systems and remote sensing as adequate methods to provide continuous or multi-temporal land use cartography, since image classification provided by SPOT, LANDSAT and IKONOS technologies integrated with existing GIS databases permit the creation of output relevant land cover maps, enabling us not only to calculate percentages of areas farmed within a city but also to follow up on developments (Esquillo-Ignacio *et al.*, 2001; Dongus, 2001; Madaleno, 2003).

The paradigm of sustainable development redeemed covered gardening and small-scale activities as a symbiotic relationship between all beings. Positive action came from the European Commission, which put the emphasis on a healthy environment, social cohesion, and economic efficiency being in harmonious co-evolution with processes of democratic participation so that urban sustainability could be construed and extended into the future (Mega, 2000). Inclusive attitudes are the reasonable expectation of many, in order to overcome actual changes in economic structure and to describe the current characteristics of multi-functional cities, for one cannot simplify reality and exclude recognizable land uses. Therefore, the gap between the urban and rural realms is diminishing, particularly if one sees it through a behavioural concept of urbanization.

Such discussion is not new. Writing as far back as 1941, Redfield suggested there was no rural–urban dichotomy. He introduced a widely contended notion of the folk–urban (or rural–urban) continuum, which led to role-confused theory about the urbanites (Carter, 1975). Many argued for decades there was no scientific testing of the continuum, and urban planners persistently drew city limits, as if one could artificially divide the rural from the urban realms in terms of people's habits and attitudes, as well as human occupation and land uses. Statistics kept the divide but as mentioned earlier reality surpassed theory and complicated what was formerly considered simple and unquestionable. Furthermore, in spite of increasing economic specialization and advancing technology, higher environmental standards are making urbanites well disposed towards nature and organic agriculture. This reality is of course valid for developed countries and their cities; in the developing world, "agriculture friendly urbanites" are simply synonymous with survival. (Devas and Rakodi, 1993). Migration of rural populations places high demands on cities to provide jobs and adequate living conditions, while not surprisingly migrants incorporate agriculture as part of their livelihood strategies. Nevertheless, nearness to urban markets, closeness to institutions providing credit, easier technical advice and technological transfer, as well as space availability makes farming a higher-return activity in periurban areas and therefore its contribution to the food supply has been increasing in relation to "rural agriculture" (Danso *et al.*, 2002).

Differences between farming in "rural" and "urban" areas recorded by experts are: (1) the urban farming population is more heterogeneous (see *Table 1*); (2) urban agriculture, in particular intra-urban agriculture, is characterised by high levels of land tenure insecurity and space limitations; (3) urban environments are further characterised by rapid change, which makes field research much more tricky; (4) urban farming has a much wider range of actors interacting and operating in production, transportation, marketing and trade, including public institutions, NGOs and international organizations, making the players' detection a grueling job; (5) periurban agricultural areas are land use conflicting spaces requiring state intervention in order to regulate landownership and less competitive economic activities, which is not always perceived as a priority by city or metropolitan governments that often fail to integrate farming into urban planning; (6) food is not the

Table 1 Comparison of key features between "rural" and "urban" agriculture

Features	"Rural" situation	"Urban" situation
Farm type	Conventional	Mostly unconventional, mobile and transient; partly over ground or without soil
Farming livelihood	Primary livelihood, full-time job	Farming is often a secondary livelihood, a part-time occupation
Farmer identity	Usually "born" farmers	Heterogeneous: "beginners", part time and pendulum farmers, migrants from rural areas, hobbyists and people engaged in occupational therapies. Women frequently outnumber men
Community profile	Majority of community members busy in farming	Percent of community members engaged in farming is highly variable
Stakeholders' views on importance of agriculture	Generally supportive	Contrasting views
Political, social, economic and cultural context	More homogeneous	Widely heterogeneous
Land use	Generally stable for agriculture	Highly competing land uses (agricultural and non-agricultural)
Cropping calendar	Seasonal periods	Year-round growing of crops
Security of land tenure	Relatively high	Relatively low
Labour costs	Relatively low	Relatively high
Access to markets/inputs	Often far from market location	Closer to market location, favourable for perishable cash crops/products
Availability of research and extension services	More likely	Less likely except for government supported projects
Policy support	High priority on policy agenda	Mixed; policies often vague or non-existent. Frequent short-term pilot project support

Adapted from: Campilan *et al.* (2001).

sole target of urban gardeners and periurban farmers, non-food productions having great domestic and commercial utility, such as aromatic and medicinal plants, floriculture and other ornamental crops; (7) urban farming has two-way daily interaction with the urban economy for resources, services and products, due to obvious locational advantages that undeniably differentiate it from traditional rural agriculture (Van Veenhuizen *et al.*, 2001).

Latin American cities

Portuguese and Spanish colonization in Latin America generated diverse urban forms and cities different in shape and ideology. Because Portuguese cities were quite chaotic, the same topographically adapted street design was exported in the 15th and 16th centuries to Africa and to South America. By contrast, Spaniards adopted a grid and fairly regular streets, centred on a church and public buildings in a square, for it permitted higher space control and perpetuated the Renaissance modernization, as adopted back in Spain. This difference is notorious and explains why *favelas* penetrate a Brazilian metropolis like Rio in recent times, making city governance a difficult task and police control a nearly impossibility. City location was also differentiated, for while the Portuguese sought proximity to the Atlantic Ocean, Spaniards preferred interior locations and square built cities in higher and fresher locations.

Milton Santos divided Latin American urban development into three main periods: (i) 1870–1950; (ii) 1950–1980; (iii) from 1980 to present. The first period was dominated by the railway and industrialization, both leading to a wider social segregation in the cities, notwithstanding the importation of Haussmann's boulevards, squares and parks, that contributed to the beautification in many urban centres. In the early 1900s Anglo-Saxon garden cities and neighbourhoods were also imported for the pleasure and consumption of a demanding and growing middle-class, followed by German zoning in urban planning, tending to separate the place of residence from the working place, and giving some order to an already frenzied growth process.

In the second period, metropolitan expansion and consolidation prevailed, such as in Mexico City, Sao Paulo, Buenos Aires, Rio, Santiago and Caracas. Industry was reallocated in suburban areas, transport systems widened urban agglomerations, automotive means were used either for people or for goods, quickly replacing railway systems, monopolising all possible applications and dictating oil dominance (in spite of the Brazilian sugar alcohol program, intended to generate an alternative fuel). Poor people were forced to live further and further away (with the exception of *favela* enclaves) and the CBD knew increasing tertiary development and vertical growth. The mirror of Latin American cities was no longer Europe but North America (Lemos, 2003). The last city development period was drawn after Brazilian urbaniza-

tion trends, an appropriation sometimes regretted elsewhere. The 1980s were the lost decade, when capitalism was confronted with unsolvable oil dependency, high inflation rates required radical financial solutions, and communism started collapsing, giving birth to a universal neoliberalism, first seen as the panacea to all economic flaws and afterwards as an inevitable curse (Machado, 2001). Globalisation now models city life and morphology, architecture is transnational, for modernity imposes foreign high technology reproduction, coming together with powerful multinational companies, and even culture, science, marketing or finance are compelled to follow global standards. Places are at war; city success lies in service sub-sector specialisation and depends on the quality of human capital. Demographic expansion of the Latin American metropolis is decreasing but closed condominiums proliferate in the urban peripheries, conceived after the "one family—one house" American middle class model (Hall *et al.*, 1991; Lemos, 2003).

About eight in ten people live in Latin American cities. The urban population has grown five times in the last five decades. In 2000, only 127 million residents remained in rural areas against 391 million urbanites (see *Table 2*). Metropolises like Sao Paulo and Mexico City have nearly 20 million inhabitants, while recent numbers show their population explosion has stopped, for there was no significant change between 1990 and the year 2000 (Satterthwaite, 2003). Intermediate cities are the ones increasing now, whereas big agglomerations are close to stagnation. The process is due to current economic crises but also to urban diffusion.

Precarious local resources (like water), placed most Latin American metropoles in a critical situation, because there was no longer a symbiotic relationship with the surrounding land, and the mother city with satellites came to the limits of sustability. Manufacture and high technology services are being de-located from multimillion agglomerations to medium sized urban centres. De-concentration is universal though we do not necessarily share Mumford's thesis that metropolis are part of a cycle of growth and decay, from polis to metropolis to megalopolis and finally to necropolis (Mumford, 1956; Jones, 1990). Cities are influenced by the interaction of international and local forces: Sao Paulo has currently 17.8 millions, Mexico City has 16.4, Buenos Aires 11.3, Rio de Janeiro 10.2 and Greater Lima reaches 8.2 millions. They are nodes in the system of global city regions, heightening differences and perpetuating instability between Latin American urban centres (Lo and Yeung, 1998; Machado, 2001).

Table 2 Recent trends in urbanization in Latin America

	1950	2000	Growth
Urban population in Latin America (millions)	70	391	321
Urban population in Latin America (%)	41.9	75.4	33.5
Urban Population resident in Latin America and Caribbean Islands (% World population)	9.3	13.7	4.4
Latin American cities above 1 million inhabitants (no.)	7	50	43

Adapted from Satterthwaite (2003).

Urbanization processes in Chile

Chilean territory is widely scattered. The country is outstretched, between 90 and 445 km wide, and spread from 17° 30′ S to 56° 30′ S. The country is a geography and a geology class—Tertiary Alpine movements strongly shape the country, compressing habitable lands between the Andes and the Coastal Mountains, cities, towns and villages having been settled through times in a central flat depression connected with stress to tiny ports, from where trade and cultural bonds were established with external and far distant places and people. Whereas Northern areas are desert environments, from about 27° to 41° S mild temperate climates dominate, associated with successive transversal gorges, icy waters running from the Andes toward Pacific Ocean, high fertility giving way to profuse vegetable and animal farming in larger alluvial rich soils. Because temperatures lower southwards, these central areas in Chile were also mandatory scenes for urban agglomerations (favourable locations as such being quite rare elsewhere) which generated unsolvable quarrels between city people and urban planners on one side, and farmers, cattle raisers, and the Agriculture Ministry on the other. In fact, Spaniards strongly protected central alluvial valleys and farmers during colonisation, developed Indian irrigation canals, and built new cities coincidentally close at hand in order to politically control, religiously lead the settlers, and simultaneously exercise military domain over a vast territory while organising local trade nets and dictating transportation costs and routes. The propensity was continued after independence and was maintained as a national trait.

Reality is nowadays different as regards city and countryside or urban versus rural. Fuel networks and water supply are widespread and no longer concentrated, the means of transportation and informational technologies tend to decentralise functions and people, and the mass media project innovations, attitudes and opinions to the most remote locations, homogenizing behaviours and ways of life (Capel, 1975). This process is particularly evident in Chile though, where distance, physical barriers and unfavourable topographies conditioned peoples and settlements for millennia,

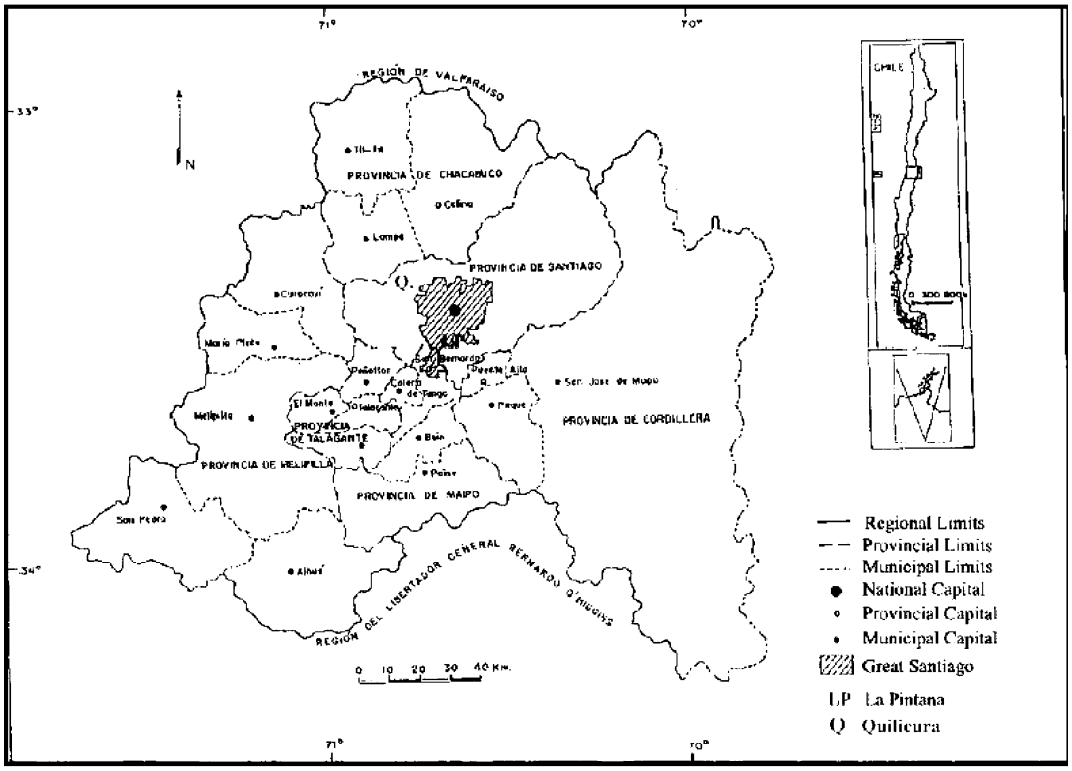

Figure 1 The Santiago Metropolis. Source: IGM, (2000) Geografía de Chile

and hampers human activities, pushing residents to the cities and notably to the capital city. In 1960 one-fourth of the whole population was concentrated in Santiago, and one-third in 1980; yet the rising pattern stopped during the 1990s.

The Santiago metropolis currently covers 1,540,320 ha and has about 6 million inhabitants (see *Figure 1*). According to recent satellite imagery, the city evolves along the main circulation axes in a star like shape composed by a very dense urban tissue surrounded with an extensive green belt, that is fruit, horticulture and vineyard dominated. Because intensively urbanised areas are compressed between the Andes (Provincia de Cordillera) and the Coastal Mountains (W), the Chilean capital city spreads along a nearly flat graben drained by the Maipo–Mapocho Rivers, whereas the periurban interface encircles the urban continuum stretched in a North-Southwards direction avoiding the mountain cliffs, in search of good accessibility, water and soil fertility, a process that is speeding up with cities located down the former Pan-American route.

In the last census, the country had about 15,116,000 inhabitants, 86.6% of whom lived in urban areas. According to Santos, the Chilean urban population grew 38.33% from 1865 to 1952, about 22.01% from 1952 till 1982, and a mere 3.48% to 2002 (INE, 2002). The highest city migration rate was registered during the 1950s, very closely followed by the 1940s. These were decisive years for our current case study as will be documented below. Still, it should be noted that annual rates stood high from 1940 to the 1980s. Administrative units currently used in Chile are quite artificial and somewhat confusing. Santiago's metropolitan boundaries were artificially drawn and therefore they comprise not only the urban core but also a large hinterland scattering up Andes mountain ridges, up to the border with Argentina. It is no surprise then to observe that about two-thirds of its surface is dominated by modern export-oriented farms. Greater Santiago, on the other hand, is a smaller yet sprouting urbanised location, habitually smoggy, comprising 34 semi-autonomous municipalities, the southernmost being La Pintana. Currently population is growing in periurban settings like San Bernardo, Puente Alto, Quilicura and Maipú. These and other new municipalities like La Pintana, (created after the 1981 administrative reform), all located in the rural–urban Santiago interface, accounted for 67.19% of Metropolitan Santiago's residents in 2002.

Again, facts and figures about Chile confirm ongoing studies and established theories on Latin American urban tendencies as well as classical population mobility towards the urban periphery, in

Table 3 Urban population in Chile and Great Santiago—1865 to 2002

Census years	Population growth in Chile (Basis, 1865)	Urban population	Population with residence in Santiago (%)
1865	100.00	21.88	6.34
1875	114.11	26.00	7.24
1885	137.81	28.58	7.55
1895	148.17	34.19	9.51
1907	177.03	37.83	10.30
1920	204.20	46.40	13.66
1930	235.67	49.43	16.24
1940	663.04	52.54	18.95
1952	897.38	60.21	22.76
1960	1,263.13	68.19	25.87
1970	1,676.89	75.13	30.74
1982	2,340.37	82.22	32.26
1992	2,798.66	83.46	35.47
2002	3,288.54	86.60	35.74

Sources: INE and authors.

close articulation with residential segregation, functional fragmentation headed for an urban diffusion scenario (Boyce, 1971; Bourne, 1971; Ortiz and Schiapacasse, 1997; Villa and Rodríguez, 1997; Vidal, 1999; Bourne, 2001). However, particular events and historical deeds explain peculiar trends in Chile. A contested Agrarian Reform was interrupted in 1973, during Pinochet's dictatorship, but change was gradually established, for the landlords of the past were either expropriated or their *latifundios* bought by a new class of entrepreneurs, no longer interested in domain over poor and dispossessed rural families but in transforming big properties into modern, export-oriented farms, in which the labour force was reduced to a minimum, workers being contracted only for seasonal tasks. This gave way to rural-to-rural migrations, a sort of job peregrination, and to rural–urban migratory movements, with consequent population redistribution, rural settlement disintegration, productive structure decomposition, even a replacement of male for female agriculture labour force, which ultimately generated disarray in households. Finally, one ought to underline that all these social and employment changes further mingled rural and urban populations, intertwined cities with rural realms, for males were pulled into urban and peri-urban areas where they could more easily find a formal or informal occupation, and where children had better educational opportunities.

Urbanisation processes were particularly accelerated in Santiago, which by the mid-19th century accounted for only 6.34% of the Chilean population and now has 35.74% (see *Table 3*). Formerly, the urban fabric was relatively compact (100 inhabitants per ha) and most public services and trade were located in the historical nucleus. In fact, from the year 1888 onwards an urban perimeter has been instituted, the limit being carefully reviewed every single decade, claiming to separate realms, land prices and soil occupation (Madaleno *et al.*, 2002). In recent times the urban fabric is becoming increasingly dispersed—peripheries are growing faster than expected and there is a rich diversity of land uses associated with a multi-centred or multi-pole agglomeration.

The workers and family plots law—virtual versus reality

Going back to the year 1941, an epoch when local intelligentsia mirrored cities and themselves after European models, and Santiago was definitely much smaller, there was a controversial law approved by the Congress, which destined funds to the delineation and distribution of food gardens and micro-farms to less-wealthy workers and their families, in settings to be located within cities or in the near vicinity. The idea was part of a long fight commanded by a very innovative cooperative movement, but was introduced in Chile by politicians after French and Swedish models, aiming at provision of generous portions of land able to give poor households self-sufficiency (Rivière, 1910; Maza *et al.*, 1947). One has to emphasize the land distribution legislation was discussed during a world conflict, and following a destructive earthquake (1939), in a country already ravaged by rural exodus, where urban poverty was increasing and the economy relying on itself only. It was an expensive solution for urban poverty though, for the government had to use public property or then buy land from private owners, in order to organise the process, define priority situations, give credit, build houses and all the necessary infrastructure, and even train the potential food growers.

Chilean experience around the food gardens programme also derived from a long lineage of utopias, dating from the 19th century, intended to redeem social environments and congested cities, all steeped in tree, vegetation and garden symbolism, as well as in solidarity alliances ideologies. The most significant contributions came from

emblematic literary productions such as Proudhon (1840), Robert Owen, (who was the mentor of Chilean Architect Fermin Vivaceta), Fourier, and particularly from pragmatic examples of successful farming plots assigned to poor families in or close to urban areas in Europe and the USA. That was the case of Sedan's Felicia Hervieu philanthropic settlements; Detroit's 4000 m^2 vacant-lot farms using the commons, implemented through the Charity Organization Society; and the Collings Law or Allotments Extension Act (1882), from Birmingham, applying the formula "3 acres and a cow". Pierre-Guillaume Frédéric Le Play, mentor of Christian-charitable thought and practice preached a sort of manufacturing worker bond to productive soil. He supported alliances between industrial and agriculture labour that he saw as essential for keeping families united and active, additionally generating healthy food suitable for household nutrition improvement, food gardens being an important resource for the poor in times of crisis and unemployment. Le Play further developed the notion of *homestead*, envisioning single-family houses surrounded by a small property as a panacea against for urban problems like poor housing and job loss. One of the consequences of his work in architecture and urban planning was suburban house construction for manufacturers, which gave way to the workers' neighbourhood conception by von Ketteler in Germany, von Vogelsang in Austria and Patrick Geddes in Britain (Le Play, 1870).

Politically, the "food gardens for all" ideology went well not only with conservative paternalistic options but also with the socialist logic dominating the late 19th and early 20th centuries (Gravagnuolo, 1998). Therefore, 1901 was the year of the first French Workers and Family Plots Law, identified as collective land possession in a mutualist framework, property usufruct and farming activities being a perogative of poor urban families. Saint-Etienne, an industrial city located in the upper-Loire valley was one of the most remarkable examples of the 1901 Law application, with community or allotment gardens implemented under Catholic Church intermediation in France. In Chile, the idea of intertwining agrarian activities with manufacturing came from the 1882 Carahue City Plan, as well as from the cooperative villa Queule designed by José Luis Mosquera (1924), and was a constant presence in all Agriculture Colonization Fund public interventions from 1928 onwards. Workers micro-farms (*huertos obreros*) were first discussed in the Chilean Parliament in 1925 without practical results; yet in 1931 the Law no. 4931 dictated that those employed in manufacture should be given access to credit in order to pay for small single-family houses with a little garden space intended for farming purposes, that the state proposed to build (Sabelle, 1943). Four years later the Congress created the Popular Housing Fund (*Caja de Habitación Popular*) with the precise aim of coordinating all public housing projects in the country. It was this organism's technical staff who established that the adequate plot for farming purposes in periurban single-housing projects should be half a hectare each (Robinovitch, 1937).

Finally, in 1936 Senator José Maza proposed a quite advanced law, fed on European examples he had seen himself, to settle less-wealthy families in half to 1 ha plots, to be tended in a cooperative manner and sited inside or around urban centres. The idea was somewhat ambitious and thus had to wait for a radical party president as sponsor (Aguirre Cerda 1938–1941); in February 1941 Congress agreed. The concept was to create two distinct patterns, associated with differently dimensioned plots: 500 m^2–0.5 ha geometrically drawn properties were located inside the urban fabric or in suburban areas. Here single houses should be built possessing enough space around them for food gardening. They were called "workers gardens" (*jardines obreros*) and "family gardens" (*jardines familiares*), if the male head of household had his own business. Half to 1 ha micro-farms, introduced in peripheral areas, particularly Santiago's rural–urban interface, came with standard three room houses (46.5–70.5 m^2), in even more spacious patterns that could enable families to create home industries of any sort, but particularly engage in vegetable or animal farming, intended for family nutrition amelioration, a business profitable enough to pay for credit and ensure household self-support.

Credit was for plot acquisition, to be used by Chilean nationals only, and priority given to: (i) former workers cooperatives (there were at least six in Santiago, existent before 1941, one of which is nowadays part of the municipality of La Pintana we will focus on in this paper); (ii) individuals with innovative industry and farming projects and sufficient know-how; (iii) big families, possessing members in adequate numbers for micro-farming purposes; (iv) individuals able to afford a minimum fee up to 5% of the plot and buildings cost; (v) in equal circumstances, households with lots of mouths to feed. Public loans ranged from 10,000 pesos (for domestic manufacture) to 40,000 to acquire one single "workers garden" plot, 80,000 to a "workers micro-farm" and 100,000 for "family micro-farms", a substantial difference intended to help house construction which in this particular case was not built by the Popular Housing system.

Workers and family micro-farms should be established in a minimum set of 20, organised as a cooperative, instituted for communal work organisation, in order to command the settlement process, to buy and share mechanical inputs, to manage irrigation water systems. One agronomist per cooperative should provide technical training, a

Table 4 Family and workers plots existing in La Pintana municipality

	Las Rosas	Mapuhue	José Maza	Total or average
Number of plots	189	322	493	1004
Total surface in Ha	134.36	316.60	301.33	752.29
Total population	1,598	2,178	3,083	6,859
Human density (inhabitants/ha)	11.89	6.88	10.23	9.18
Number of interviews	21	40	50	111
Interviewed plot owners or managers (%)	11.1	12.4	10.1	11.1

Source: 2003 survey.

specialised engineer selected and paid by the state, an obligatory presence at least for the first five years. Surveillance and control from extension services should continue at least till all the proprietors had paid their debts. The area developed should have streets in a regular grid, conveniently placed squares, schools, sports compounds, water, electricity, sewage systems, and independent irrigation channels. The government provided all infrastructure but public spaces should not exceed 20% of total surface area. After one-fifth of the debt was liquidated families could recover their property titles. Still they could not mortgage or sell their plot, the gardens, nor the water rights without the cooperative's agreement, and subscribed to the principle of never subdividing the land (Diario Oficial, 1941).

Conditions established in law were not necessarily guarantees of success. Still there were examples of well turned-out gardens and micro-farms all over Chile, as is the case with La Calera, sited in the north of Santiago in the so-called Fifth Region, a settlement located along the fertile Aconcágua River. Very few agro-residential plots managed to survive urban expansion, modern life demands, and property subdivision, while economics turned urban farming into a low-grade odd job. Hence, workers and family gardens located inside Santiago, an example being La Granja, (a suburban neighbourhood managed through a co-operative system with goals other than gardening), have been engulfed by city spread, ravaged by population growth and conditioned by zoning that caused the demise of gardening plots. Compelling housing demands sacrificed quality to quantity.

Latin America has displayed historical social class segregation tendencies while difficult conditions and harsh poverty dictate a system of family, ethnic and vicinity loyalties such as recorded at La Paz, Bolivia, in support of food security (Kreinecker, 2000). The wealthy prefer to live in higher places (*barrio alto*), in Peru as in Chile, because they are fresher, less polluted, greener and safer neighbourhoods, additionally posing better views. Less wealthy people, in contrast, spread through linking roads and highways along depressing, air polluted, either arid or river flooded sites. No wonder the 1941 micro-farms installed at La Pintana municipality, 16–18 km southwards from Santiago's core over Maipo valley, are surviving plots, mostly low-middle-class dominated these days, senior residents evoking their story and original land uses and keeping up tradition, in search for distinctiveness.

Santiago's family and workers micro-farms

To translate the Spanish *jardines obreros y familiares*, we have been using the expression ''workers and family gardens'', whereas for *huertos obreros y familiares* we used ''workers and family micro-farms''. Differences are both rooted in plot sizes and in location for the first settlements are less than half an hectare and sited inside the urban agglomerate, sometimes even quite small (500 m^2), whilst the second category ranges from half up to 1 ha and is clearly peripheral. Another question is why to use the word family instead of household? That is because the Social–Christian movement from which the concept evolved in the early 1940s dictated traditional nuclear families should be the target of Chilean government subsidies and land distribution for low-priced acquisition. We must clarify, though, that the remaining micro-farms researched south of Santiago evidenced a wide range of households owning, renting or caring for the plots diverging from prototypical male wage earner, female housewife and children (see *Table 4*).

Household plots investigated at La Pintana are production, reproduction and consumption spaces, mostly used for farming and or grazing but not exclusively. Whichever land use is adopted, they all possess channelled irrigation water available in the area from 1800 and conveniently ducted into the plots from the nearby Maipo River. In order to develop this particular case study we sought after plots that kept the original land uses, stressing they do not necessarily constitute family businesses in the traditional sense.

A joint Portuguese–Chilean team investigated the municipality for over two years (2002–2003). Totaling 3031 ha, the La Pintana administrative unit was institutionalised in 1981, following the military regime's 1979 urban reform, city limit enlargement and municipal subdivision. Formerly dominated by big agrarian properties, the area became a favourite location for micro-farm

Figure 2 La Pintana municipality micro-farms, Southern Santiago, circa 1996.
La Pintana: Air Photo; urbe—built-up areas, Uch—University of Chile (Agronomy Faculty), LR—Las Rosas micro-farms, M—Mapuhue micro-farms, RM—Maipo River, JM—José Maza micro-farms

settlements as far back as 1942, for two obvious reasons (i) reasonable site accessibility and space availability on the edge of Santiago's province, conveniently distant from the capital-city's historical centre; (ii) beneficial setting for farming purposes in the fertile and intensively irrigated Maipo river basin.

La Pintana was allegedly the first hacienda (called *fundo* in Chile) bought through The Popular Housing Fund in periurban Santiago. It belonged to descendants of Anibal Pinto, president of Chile between 1876 and 1881. As a result, a community of 500 worker micro-farms was instated there, under management of a cooperative named after political mentor of 1941 Law, Senator José Maza. One has to stress the José Maza 0.5 ha micro-farms account for about 10% of La Pintana territory, even though administrative subdivision took away seven plots, nowadays integrated in neighbour San Bernardo municipality (see *Figure 2*). Cooperatives were used to implement plot distribution to workers families, to develop house construction and promote vegetable production, through training, communal work organisation and collective tractor manipulation. The system had been designed to resettle and nurture surplus rural migrants, bus and truck drivers, manufacturing workers and in general less wealthy households. Other settlements have been inserted into the La Pintana unit during the 1940s and 1950s, as is the case of Las Rosas and Mapuhue, the last being family micro-farms, mostly 1 ha dominated. The importance of this case study lies in the fact that micro-farming occupies one-fourth the municipal area, with only rare cases of plot subdivision, in all terms illegal. Domestic industries and artisan work of any sort were also promoted via 1941 Law, for the activities were seen as appropriate for female family members, who should be committed to tasks like seeding, tending, cleaning, irrigating, animal husbandry and manual cropping, on a daily basis, besides child and family care. Males, on the other hand, had to perform heavier activities like manual or mechanical soil preparation, fruit cropping, tree plantation, produce transport and commercialisation, in addition to their job duties unless they

managed to survive on farming only. The movement kept the link between the urban man and nature in conjunction with intensive manual work, leaving the settled families no time for bad habits like drinking or stealing, especially because land ownership achieved after some years of credit payment made them honest proprietors (Maza *et al.*, 1947).

The consequences for what was then southern Santiago's rural area were population migration and growth. From the 1940s onwards, residents grew from little more than 1000 to 194,841 inhabitants (*Table 5*). The movement was not always voluntary, particularly during Pinochet governance as was the case for illegal settlers evicted from *Las Condes* (a high-middle-class Santiago neighbourhood) forced to La Pintana in the 1980s, because there was enough room there for social housing whereas distance was sufficient to prevent them from returning to their former sites. Between 1982–1992, La Pintana registered the highest growth rate in the whole metropolis, having received 95,708 new inhabitants, mostly poor and marginalized families, resettled right south Las Rosas micro-farms at The Castle slum (*El Castillo*) which dictated social unrest and jealousy, for plot distribution was no longer a government policy (Gurovich, 1999).

Politically the micro-farms are not attractive for local government either. Preconceptions of technocratic city planners and managers have, from the 1980s onwards, encouraged industry and services inside the agro-residential sectors institutionalised in 1941. It is therefore frequent, at the Southern Santiago rural–urban interface as elsewhere, to see local communities hinder expropriations of first quality family farms in order to build new access roads; distressed neighbours fighting against industrial occupation of plots with provisional permits and questionable municipal licenses; worried cooperatives with oil-polluted irrigation water, due to illegal garages and auto mechanic businesses. Yet the weight of agriculture and related activities is still enormous. A sum of 111 plot owners, tenants or caretakers was interviewed in January and February 2003, using a sample questionnaire, semi-open because authors personally undertook the survey and sought to gather as much information as possible through random spatial methods; these had been successfully applied in similar studies in Brazil, consisting of street-by-street balanced inquiries (Madaleno, 2002). Results have shown about 80% of the half ha and one ha plots have vegetable and/or animal farming uses.

Table 5 Population resident at La Pintana municipality, Santiago

Years	Inhabitants	Annual growth rate
1940	1063	–
1952	2599	6.99
1960	5718	9.37
1970	36,502	14.58
1982	73,932	5.65
1992	169,640	7.86
2002	194,841	1.39

Sources: Secretaria Regional Ministerial (SEREMI) Metropolitano de Vivienda y Urbanismo and INE (2002).

This was unsurprising. The last Chilean Census of agriculture and animal husbandry has recorded 1638.9 cultivated ha of soil at La Pintana municipality, totaling 54.07% of the municipal surface (INE, 1997). More than half the plots belong to the 1941 Law settlement units, as mentioned. These three agro-residential sectors surviving against all odds inside the southern satellite-city of the capital of Chile are preserved as an area of agro-residential interest in the Master Plan. The percentage of landownership is quite high at José Maza and Las Rosas, whereas low income-dominated Mapuhue accounts for 36.7% tenants and nearly 17% employees and caretakers, some of which have enduring informal land usufruct (see *Table 6*).

The "lost decade" (1980s), under the Pinochet military regime and subsequent social and economic unrest, produced a loss of nearly two-thirds of the initial landowners. Micro-farm residents for over 20 years are only representative at the oldest 6815 Law settlement, José Maza. That is also the setting registering higher permeability to alien land-uses like industry, commerce and a wide range of services, but where 52% of the plots visited are kept for farming purposes and 30% are used for fruit or horticulture production together with other businesses. José Maza is the southernmost tip of La Pintana municipality and the most isolated location, stuck between richer San Bernardo (W) and fast growing Puente Alto (E) municipalities. As to Las Rosas, halved by an East–West freeway, the shift from agricultural land-uses are associated with highly questionable cases of plot subdivision (two, in fact) for poor housing development, as well as servicing facilities such as bus garages, medical care clinics, oil stations.

In spite of heterogeneity in micro-farmers' social composition, a characteristic life philosophy accompanies the households who tend and occupy La Pintana plots. We would describe it as somewhat environmentalist, space consumer, pure air devoted, fresh and organic nutrition-friendly. Change in landownership composition over time and in proprietors' life cycles, has so far failed to destroy land use uniqueness. We found several examples of two of the three generations present caring for one single plot, particularly at Mapuhue where the biggest and more productive farms exist. Farming is not an elitist land use nowadays. These are not charming suburbs, for all socio economic classes can be documented.

The best-managed cooperative persists at Mapuhue, where landownership covers only about 47%

Table 6 Relational data about 1941 institutionalised sectors at La Pintana, Santiago

Variables	Sample locations			
	Las Rosas	Mapuhue	José Maza	Average
Farming under 1/3 plot surface	80.9%	77.5%	82.0%	80.1%
Farming over half plot area	47.6%	70.0%	52.0%	56.5%
Low level income families	41.2%	80.6%	55.0%	58.9%
Property owners inquired	70.6%	46.7%	70.0%	62.4%
Residents for above 20 years	29.4%	32.2%	39.0%	33.5%
Farmers over 60 years old	47.1%	36.0%	37.5%	40.2%
Commercial agriculture practitioners inquired	12.5%	51.6%	13.9%	26.0%

Source: 2003 survey.

of the micro-farms and 3% are farmed on a sharecropping basis, exactly as is usual in the ''rural'' realm. Commercial agriculture predominates, with little chemical input, three quarters of the farmers surveyed having declared they use compost, manure, and ''traditional natural'' herb and pest control methods. Irrigation water feeds intensive horticulture and extensive fruit culture, most of the time associated with animal husbandry. Water comes from the Maipo, channeled by means of well-kept systems managed by elected and independent representatives from the community. Mapuhue is one paradigmatic sector regarding cattle farming businesses, because most plots are 1 ha and it is also the location of a questionable slaughter business, frequently accused of polluting irrigation water and soil. The most characteristically ''rural'' of the settlements though, Mapuhue has no asphalted streets, as is the case with the other two, but that is exactly why businesses with better returns despise the neighbourhood, the same way landowners postpone ''progress''.

Conclusions

The paper stressed the fact that urban and rural conceptions are not in opposition. Moreover, limits imposed over these two dominions are artificial and unreal, first because even in European medieval times towns walls did not prevent animal or vegetable farming from developing, but merely imposed space constrictions on food growth, whilst in our times a band of ornamental or eatable greenery surrounds downtown city areas, intertwined with single and multiple housing units, amid industry, commerce, and services, giving a remarkable heterogeneity of land uses to the urban, suburban and periurban worlds. Of course we agree that when urban development booms, green and open spaces tend to shrink and farmland to disappear. However, innumerable examples of gardening inside cities and farming thereabouts make us aware there are broad ranges of people linked to urban farming all over the globe, either for recreational reasons or for healthy fresh food needs, not forgetting good business opportunities.

Community or allotment garden movements are anticipated as self-esteem builders and self-help alternatives to the traditional food bank, the rural realm. Definitions are abundant, gardens being tended both collectively or divided into plots assigned to individuals or families to garden and harvest (MacNair, 2002). Micro-farming in periurban Santiago is part of the allotment garden experience, some of the best surveyed or reviewed, assisted by a supportive social ideology, strong initial public policies and a well-drawn legal framework. Cooperatives survived political and economic change, and tenure conditions established stability and ensured continuity of half up to one-hectare plots. Most residents honour their raison d'être, meaning food supply, for self-consumption, beyond business, on top of the values husbandry instils, opportunities thus offered, not to mention the pleasure, beauty and health that gardening culture offers to the elderly. Orthodox planners see the remaining allotments from 1941 Law as a relic inherited from former rural belt, a mistake wrongly absorbed by city expansion, an alien land use incompletely integrated in the urban tissue. More than a product of history, beyond rehabilitated philosophies, putting together Social–Christian charitable work, socialist utopias, mutualism, cooperative ideals, with modern environmentalism, micro-farming in southern Santiago proves that there is no incompatibility whatsoever between the city and the countryside. Clichés like ''food plots for the urban poor'', ''garden cities for everybody'' and ''sustainable life for urbanites'' are kept alive to the present in the survival stories told.

In Chile, as elsewhere in Latin America, city growth and expansion pressures are increasingly the lot portions of peripheral farming spaces, coinciding with structural changes in production and land tenure, property fragmentation and land use diversification. The continuously restructured periurban areas perpetuate inequalities and contradictions in residents' social composition, in people's ways of life, in peoples mentalities. The ones inhabiting this particular rural–urban interface are commuters, not as wealthy as their North American counterparts but possessing an enviable quality of life. They are neither urban nor rural

populations but something else. The spaces under examination in this paper belong to ring areas around Great Santiago, subject to state functional and regulatory control, intensively targeted by pollutant or space compelling businesses and housing development pressures. Differences with other case studies lie in collective and vocal representation on the local political scene. Should La Pintana microfarmers be less challenging than they are, not as firm in opposition to homogenisation, not as united as they are in solidarity chains, then their property and traditions would have been swallowed by the urban fabric, depriving us of this sort of agropolis, a living ecocity laboratory.

The environmentally balanced growth of cities must be reached exploring interactions between market driven growth and spatially driven planning. State planning and governance—whichever regime is adopted—should never give up on their chief regulatory role over land uses, because tenure conditions are necessary to provide stability and ensure continuity of programmes combining residential with agricultural functions within a city or metropolis. Periurban areas are conflicting ring spaces and wealth is synonymous with healthy development, particularly in large urban agglomerations. Farmers in such areas need not only land security to facilitate their social, economic and environmental sustainable operations but also clean technologies as priority policies for the benefit of many, otherwise farming can be as much of a pollutant as other classic urban activities. Balanced areas, as the one we have focused in this paper, have surpassed pilot projects terms and deadline, in spite of the pressuring macro-economic context, proving no sophistication is necessary in order to keep people in touch with land and nature in the big city.

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