Urban agriculture, an environmentally sustainable land use – case studies from Europe, Latin America and Africa

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Abstract

Agriculture was always part of city landscapes. However, it has been widely depreciated by urban planning and city management. The purpose of the paper is to demonstrate that like many land use trends, urban agriculture is currently increasing both in rich and poor regions, in every possible latitudes. Research results from a diversity of countries, namely Brazil, Mozambique and Portugal have proved that local policy options for city farming as an environmentally sustainable land use are a new phenomenon and a welcomed initiative by a diversity of peoples. Conclusions will show that there is a wide acceptance of idle public inner and peri-urban land occupation, with horticulture practiced by less wealthy families. The vast majority of food growers inquired use organic fertilisers and produce healthy food. There are also examples of pedagogical gardens in kindergartens and schools where youngsters are stimulated to plant, weed compost, water and harvest the produce they eat in the schools canteens, whereas City Farms existent all over Europe tend to happily associate the urbanites with green spaces and animal keeping within city boundaries. The aims of the programmes are to ameliorate people bonds with nature and other living creatures and give consumers, in general, the possibility to enhance food security with less expensive goods, improving altogether the quality of nutrition in urban settlements.

1 Introduction

Half the world’s population is living in an urban environment. Along the first quarter of the 21st century cities are previewed to be mushrooming, particularly in
the African continent, following a tendency long initiated by Latin America, representing a major problem for humankind. One potential danger will be the inability to create the necessary infrastructures and feed the urbanites at a convenient pace. Inequalities between the urban rich and poor might give way to unrest and pose challenges to city planners and managers.

There are, fortunately, countless examples of how urban problems can be solved, leading us to a more optimistic view about the future. One solution is the promotion of agricultural spaces within and around urban centres, in order to improve the environment, reduce natural hazards consequences, create employment and ameliorate the urbanite’s nutrition. While we hope for a more people-based decision-making system to prevail in future cities, it might be stimulating to start an informed debate with several successful supportive policies from national governments and local management, as well as international institutions programmes.

The paper will focus urban agriculture trends from cities located in three countries. First, a developed European Union metropolis, Lisbon; then, two cities from the South American giant, Brazil; finally, an African paradigm, Maputo, capital of Mozambique. Similarities are the common language and cultural roots, even though economically they are quite different, coincidentally representative of the 3 income levels established by the United Nations, being Mozambique one of the poorest countries in the world.

2 Urban agriculture in Lisbon

City farm’s movement is growing around Europe. Eight officially protected farms exist only in London where animal keeping predominates [1]. The programme’s aim is to give opportunities for children, young people and adults to nurture respect for agriculture and animal grazing, formerly seen as alien activities to the cities, to reconcile the urbanites with nature and other living beings, through promotion of vegetable beds watering, trees plantation, cows milking under supervision or horse feeding.

Lisbon municipality created a city farm in the Spring of 1996 with an educational role, giving urban children, accompanied by their parents or teachers, the possibility to experience daily life in a rural setting, through contact with rabbits, ducks, pigs and sheep. They can also participate in the manufacture of bread and pastry in the farm’s kitchen and the biologically grown vegetables are given away to several local schools, in order to be consumed in the canteens. Annually around 100,000 people visit the 1000 m² Olivais farm, a low-density residential neighbourhood located in the Eastern part of the municipality.

While the vast majority of enthusiastic visitors are youngsters it is also true that public national and Lisbon municipal promotion policies of primary sector economic activities have been directed towards them in recent years. Regarding the Portuguese capital, the mother-city (564,657 inhabitants in 2001) has been losing population to the advantage of suburban towns, for the soil and the flats became far too expensive to single individuals or newly constituted families, and redeveloped buildings, particularly in central districts, are quickly taken by
tertiary activities. In the last twenty years Lisbon lost about 30% of the permanent residents.

That's why public schools and kindergartens were stimulated to develop their own pedagogical gardens, where a compost tank became a vital element, because biological agriculture is the only officially supported. It was the solution found for accelerated population ageing and city desertification. In fact, 24% of the residents have more than 65 years, whereas only 12% are less than 14 years old[2]. By means of curricula diversification and ecological education, Lisbon schools were given the possibility to demonstrate children and adolescents how to ameliorate the environment, right in the core of the country, an added value to other public schools. Many new pupils were then matriculated in the almost empty schools, allowed to study close to their parents working premises instead of their permanent residence, as it should be by law, hence bringing back youth to Lisbon together with green, permeable and productive spaces.

In 2001, a public Bank Foundation organized a prize-winning contest called “Lisbon food gardens”. About 40 farmers and gardeners made their application, eleven of which were private and public schools. The winner was a pedagogical garden located in the Angels neighbourhood (Anjos), adjacent to the CBD. In a 200 m² area, around one hundred 6-10 year old kids grow potatoes, maize, wheat, carrots, tomatoes, onions, beans, green peas, lettuce and countless other vegetables. Spices, medicinal herbs, flower shrubs and fruit trees are incredibly numerous, permitting boys and girls to consume and sell, in profit of other school needs and activities, the peaches, pears, apples and all kinds of citrus they carefully tend, by turns, all year round.

Citrus are indeed some of the main inner and backyard trees in Lisbon, for most of the private gardeners inquired so far possess juicy oranges, lemons and sweet tangerines. As another public institution's positive trend, we should name a Museum, from Northern Lumiar district, where a project to recover drug addicts through occupational therapies in horticulture production is generating very considerable synergies. Managed by the Portuguese Ministry of Culture, the Museum allows low-paid functionaries to harvest other surrounding park areas (1000 m²), providing them food and additional income. They enthusiastically process some of the fruits in tasty jams and produce around 100 litres of honey annually, sweet appreciated goods sold to culture lovers in small jars, in the institution’s shop, along with books, booklets and all sorts of souvenirs.

As we mentioned before, Lisbon municipality is far smaller in size and is losing inhabitants to neighbour cities and suburban areas, which integrate the biggest Portuguese metropolis. However, there is a wide peri-urban belt surrounding a continuous urban tissue both in the northern and in the southern margins of Tagus River. As happens everywhere else in Europe, those are the spaces where single houses or small apartment blocks mix with hypermarkets, industrial polygons and, of course, agroforestry. Products grown there name locally known delicatessen like Mafra bread (the North-westerne municipality in the metropolis) and also internationally recognized wine brands like Colares or Palmela. The most expensive (~€20 per kg) are EU certified delicious sheep cheeses from Azeitão, South of Lisbon.
Such food is produced or processed in transition areas certainly endangered for the metropolis concentrates more than one fourth of the Portuguese and continues to attract most of the immigrants from Africa, Brazil and Eastern Europe. We should stress the importance of interventive and positive municipal roles and regulations, fortunately not limited to Lisbon, but also existent in Loures (N), Sintra (NW) or Palmela (S), contributing to farmed areas protection and persistence. Small wine producers are the ones who develop the best lobbies on public marketing strategies while producing fine reserves, as is the case with 1999 Hero of Palmela, sold from about 5 to 9 Euros a 75cl bottle.

3 Green land use policies in urban Brazil

Eight in ten Brazilians live in an urban area. Even though verticalization is a common feature in most of the big cities, a delayed and more attentive look all over the country demonstrates that the “one family (most of the times extended), one house” American dream is the really impressive mark of the urban realm. In general, the population is also known for a high trust on the healing powers of Nature and medicinal herbs, as well as for spicy culinary tastes, inherited from the Portuguese, Italian and other European influences, together with a strong African and Amerindian contribution. No wonder that in a predominantly humid climate, most of the cities display green public spaces, flowering private home gardens and a traditional inclination for food cultivation and microlivestock keeping.

Environmental protection is already a public opinion consensus in Brazil, reinforced by strict national regulations on endangered vegetable and animal species destruction, even for subsistence purposes that strangely (and again) penalise the poor. Local powers and state governments are currently introducing urban agriculture in their master plans, as it happened in the biggest of the metropolis, S. Paulo [3]. Yet some municipalities have pioneer managers who permit, even promote, public land occupation policies and extension services commitment on technical support to low-income families food production.

The examples we selected to present for further discussion are: Belem, located in the North and Presidente Prudente in the Southeast of the country; the first one is a regional metropolis and the last an intermediate city; Belem is the capital of a mining and agroforestry dominated state, in clear contrast with Prudente, an interior town from the predominantly industrial Brazilian state. The further they were geographically was the closer they got in their support to urban agriculture in recent years, a socio-economic and environmentally sustainable urban activity with a very positive accountancy.

3.1 Belem, capital city of Pará state (N)

Belém is one of the eldest cities settled in Amazonia by European colonization (1616). The city combines a very rich architecture in its historical centre, dominated by mango tree shaded avenues dating from the wealthier rubber exploitation times (1850-1920), with numerous middle and low-middle income
families houses surrounded by astonishingly biodiverse home gardens, and
countless peri-urban or urban lowland shanty neighbourhoods, where medicinal
herbs, spices, fruit trees and all sorts of animals harmonise with the urbanites.

Unemployment and underemployment are quite significant, for industrial
activities are unwelcome in the municipalities master plan [4], being planned
economy based on precarious services, decaying formal or informal commerce,
which serves more than one and a half million human beings from the whole
metropolis. While tourism and artisans are incipient, even though remarkable in
potential, fishermen survive without stress and bird keeping together with food
cropping are commonly accepted urban activities. Moreover, local management
promotes public land occupation by low-income families, a programme initiated
by the Secretary for Economic Affairs in September 1997.

The proposal was designed to start with resettlements in the scarcely
populated, fertile islands located in the Northern and Western parts of the
municipality, followed by a ring of poor peri-urban districts. Results are three
modules for vegetable growers implemented in the island of Cotijuba (W), where
a local rural population still practises subsistence farming and took the option for
duck production in littoral accessible areas, a state initiative we will describe
further on. This island doesn’t seem to be attracting significant low-income urban
migrants because of enduring lack of infrastructures, namely electricity.
However, the technically assisted plantation of tropical fruit trees in existing
private properties looks like being more reasonably accepted by the islanders,
namely multipurpose endemic species like Bactris gasipaes and Theobroma
grandiflorum, which fruit and seeds are very similar to cocoa. The restoration of
more degraded island areas will be the next step, according to municipal planners
inquired, with preference given to mahogany.

In the biggest of the islands, Mosqueiro (212.5 km²), about 17 ha were
planned for low-income urbanites to settle. Half the public plots are occupied by
coconut palms, several species of citrus, banana and cocoa. The remainder areas
are divided by horticulture and cassava, the staple food in Amazonia. Extension
services give all the technical assistance, helping the farmers to build water
pumps and reservoirs, to implement adequate irrigation systems and providing
them fertilisers (organic and chemical) and seeds. Usually work is communal, but
it is still early to evaluate the results of the programme in this northern island,
even though the existing areas, with a dozen families resettled, are doing well.

The favours of Belém people go to microlivestock public projects. The state
Secretary of Agriculture has been promoting the raise of chickens and ducks all
over Pará. Being an aquatic bird and a local delicatessen, the duck is by far the
most required in easily flooded neighbourhoods. Besides, as a chick takes about 6
months to lay eggs (which are the most profitable goods for small growers or
low-income urban families), the male duck gets an average of 4 kg in its fourth
month of age, whereas the female grows up to about 2 kg, being sold for € 20
each! The state gives 15 chicks per family, providing they accept the sheltering
and sanitary conditions imposed by the technicians, or 1 male and 6 female
ducks. Research shows it has been a successful programme, having contributed to
supplement and ameliorate the quality of diets with the necessary proteins,
additionally providing a source of income particularly for the western islanders
and peri-urban farmers, generating a very appreciated organic fertiliser too, widely used in home gardens.

3.2 The Feed Prudente Programme, in S. Paulo state (SE)

Presidente Prudente is located at 22° South of Equator and is at 558 Km west of S. Paulo. The city, barely one century old, has a sub-humid tropical climate, being inhabited by around 170,000 people from all over the country. Twenty percent of the municipality’s active population work in diverse industries and only 5.27% is dedicated to farming, mainly to cattle graze. Formal economy is more substantial than in Belém, where 11.4% of the inquired urban agriculture practitioners were unemployed in 1998 [5], against only 4.3% in Prudente, researched the next year.

Still the Secretary of Agriculture started the Feed Prudente project, in October 1997, nowadays a very interesting municipal programme. The initial objective was to stimulate community work in food production by low-income families, in peripheral neighbourhoods. Intended to favour cooperation between poor, needy, old, un- or underemployed neighbours, giving them jobs, income, occupation, simultaneously improving their nutritional status and financial situation, the initiative benefited, in fact, either families or individuals, aiming a total of 200.

Unlike Belém, livestock is forbidden inside city boundaries being the plots dominated by horticulture. Cassava, sweet potatoes, all sorts of beans, pumpkins, chicory, spices, medicinal herbs and maize are the main productions. Public land is borrowed in a quite informal way, but the municipality gives free legal advice to gardeners interested in cropping idle private plots, helping them to get leasing contracts. Therefore the programme extrapolated the initial aims with positive results, for previously there were serious problems and frequent complains with undeveloped, unclean, rats and mosquitoes dominated, badly preserved inner and peripheral areas, which the scarce municipal budget and personnel could hardly maintain and preserve.

Each agricultural plot has an average of 600 m², but in peripheral neighbourhoods one single family can harvest up to 2000 m². The municipality supplies ploughing machines, tools for soil preparation and the first seeds, while extension services promote technical sessions with urban agriculturalists followed by accompanying measures. Research results have shown most of the urbanites developed environmentally sustainable practices, with extensive usage of organic fertilisers, dung bought in peripheral cattle ranchos or all sorts of primitive mulching and compost techniques. The label of healthy food is, by the way, one of the reasons why middle and high-middle class individuals, like local medical doctors, prefer to buy fresh produce from the Feed Prudente participants. Another advantage, widely appreciated, are the lower prices paid by consumers, who buy the food directly from the urban gardeners.
How cooperatives promotion can contribute to urban poverty alleviation in Mozambique

Everyone needs to be adequately nourished to live a healthy and productive life. Since poverty is the main cause of malnutrition in Africa, and urbanisation is increasing all over the continent, it is crucial to devise strategies towards food security, which can improve health and care, therefore increasing life expectancy. In Mozambique (particularly in the South) women play a decisive role in achieving household food security for in many cities they supplement family diet with fresh vegetables and fruits grown in home gardens, additionally collecting firewood and carrying water necessary to prepare the food that their family consumes.

Therefore, female members of extended families, being maize the staple food in this region, farm a considerable portion of land located around Maputo, capital city of Mozambique. Quintas, meaning small ranchos or agriculture dominated properties, pullulated around the urban centre till middle 1970s, when the process of independence from Portugal was accelerated by the European based Carnage Revolution. Consequently most of the Portuguese owners of those properties abandoned Mozambique and their possessions altogether, in the midst of political and military turmoil. That's when poor Mozambican women started cropping the peri-urban quintas, on their own and sort of anarchically. Once some had no preparation for the job and there was no planning and control over the inputs, soon bankruptcy was all over the renamed "machambas do povo," or peoples farms. That's why in 1980, a green zones ministerial cabinet financed by the Swedish International Development Authority (SIDA) created the first set of cooperatives, giving each female tools and seeds, providing they would develop communitarian tasks in the then nationalised soil. And the movement grew intensively. In 1981, twenty-four women's cooperatives associated themselves, and bought the first vehicle. In 1983, this association inaugurated a Centre for technical education.

During the 1980s these communal production cooperatives grew, dedicated to the raise of pigs, maize and horticulture crops, with assistance and financial help from many international NGOS. After 1987, the Mozambican government started permitting private ownership of land. Instead of killing the cooperatives movement, that fact stimulated the peri-urban farmers, generating an even stronger unity of more than one hundred small cooperatives from all over the green Maputo’s belt in the form of the General Cooperatives Union (GCU), legalised in 1990.

The solid organisation, which management board was presided by an Italian Catholic priest, gave objectives and soul to the women farmers. The potentially arable land was divided by the existing families, giving them an individual plot, which they could harvest on their own, requiring in turn they would respect the Union’s leadership and participate in self-help groups. The cooperatives annually design planning strategies, from inputs acquisition and evenly distribution, technical monitoring, through produce marketing and profit reinvestment, to food...
processing initiatives in order to improve income generating schemes, within a
democratic and participatory framework.

Nowadays about 185 small peri-urban cooperatives are integrated in the GCU,
with about 6,200 women members, occupying around 2100 ha of land. The
smallest plot per family is less than 0.5 ha, usually located along the fertile
valleys where the best yield on horticultural products is achieved, while bigger
plots stand on the hills, dominated by rain-fed crops like maize, beans, peanuts,
cassava and cashew. The mostly used fertiliser is chicken manure, for in recent
days chicks have been the main bet of the cooperativists. Tree nurseries
conception and management, chick incubators, food processing and
commercialisation, as well as some other highly technical activities gave way to
900 paid jobs, half of which are also performed by females.

Besides cattle and chicken feed production, sausage factories, a butchery,
warehouses, animal vaccination facilities, repair tools and artisans shops, water
pumps and pipes, transportation vehicles, all sorts of agricultural machines, city
posts for fresh produce and meat marketing, the Union periodically organises
training workshops, even alphabetisation courses developed in the buildings
rehabilitated in 1996/97 with European Union funds, and located in the former
Centre of Mahotas (outskirts of Maputo), aiming women farmers. The GCU
possesses a Health Centre with one doctor and two permanent nurses, countless
number of day nurseries where young children can stay while their mothers work
in their plots, primary and secondary schools, a technical school built by a
German non-governmental organization, intended to ameliorate the educational
level of farmers descent. In 1998, the Canadian Embassy initiated a process of
scholarship donation for the best students to attend the University.

In synthesis, government cooperatives promotion was a quite positive measure
in order to alleviate poverty in urban and peri-urban areas, in Southern
Mozambique. However, after the institutionalisation of the GCU official support
completely stopped, while the movement continued, consolidating its basis and
functioning strategies even better after the end of civil war. Being the Union goals
not only economic but also cultural and social, it’s no surprise it frequently
attracts international institutions, NGO’s, religious organizations funding and
technologic transfer, making survival a possibility, in a country frequently
devastated by natural hazards, with an average life expectancy of little more than
40 years.

5 Conclusions

Urban redevelopment is nowadays one of the main concerns both of planning
sciences and of local political leaders. It’s difficult to study and establish
municipal regulations and management trends on land use, for democracy happily
gives the citizens the possibility to periodically change policies and politicians
through the polls. Moreover, many governments and private groups make joint
actions, which are sometimes labelled “governance”. This governance makes
processes even more complicated because it is necessary to confront global
markets challenges. Macro-Economy makes agricultural spaces maintenance, as
well as other leisure, entertainment and, in general, urban social spaces conception weakened vis a vis profit considerations. It is, therefore, immensely rewarding for critical minds and responsive citizens, with ecological and poverty alleviation concerns, to recall that throughout the developed as well as the developing world there are still successful urban agriculture promotion policies.

Regarding the examples described in the paper, particularly the Feed Prudente Programme in Brazil and the General Cooperatives Union in Mozambique, it is important to stress that if public policies gave way to the development and spatial expansion of urban and peri-urban agriculture, for most of the gardeners and farmers benefited from the technical and financial impetus given by national and local institutions, it is true that afterwards they continued on their own. That happened against all odds, in spite of all the pressures resulting from urban redevelopment, real or artificial needs, resisting political change, global economic crisis, maintaining permeable intra-urban spaces, giving diversity and beauty to the cities, producing cheaper and healthier food, and contributing to the urban realm self-sustainability.

References