Urban agriculture: The case studies of Havana and New York City

Bojan Tudor Traian[1], Pușco Oana[2]
Faculty of Architecture and Urbanism, Politehnica University of Timisoara, Romania[1,2]
tudor.bojan@student.upt.ro[1]; oana.pusco@student.upt.ro[2]

ABSTRACT
The article studies two different approaches to urban agriculture. In the first one the implementation of urban agriculture in the city of Havana, Cuba was one of pure necessity, in which the state created all the premises for it to flourish. The degree of mobilization from the population is high, being essential for food security. The second case study is related to New York, where the implementation takes place over a longer period of time, and the concept is getting traction with the involvement from residents and local communities in various neighborhoods with initiatives in this regard. There is support and involvement from the local authorities, the areas of the city with potential for urban agriculture are established, analyzes are made to determine and under what form it could be applied while solving existing problems of urban life. In both cases, urban agriculture has been successfully implemented, being a permanent or temporary layer in the cultural and green fabric.

Keywords: urban agriculture, food security, CPUL, green spaces.

I. INTRODUCTION

Population around the globe is increasing, and urban areas are expanding their borders, a well-founded reason why life in urban areas should be analyzed and examined, but especially in order to prevent our alienation as individuals from our nature, what it means to plant, to grow. Urban farms ensure the enrichment of the community, through food security, jobs, compensate for some expenses, promote social interactions and educational programs, the gardens also help to reduce the effect of urban heat, reduce the impact of storm water and decrease the energy invested in food chains.

II. CASE STUDY: HAVANA

Beginning from 1917, the U.S. imposed commercial, economic and financial embargo to Cuba through different acts: Trading with the Enemy Act of 1917, the Foreign Assistance Act of 1961, the Cuban Assets Control Regulations of 1963, the Cuban Democracy Act of 1992 and so on. Cuba had to rely on a close relationship with the Soviet Union in order to develop its economy, roughly 85% of Cuba's trade being with the Soviet block.

Due to centuries of colonialism, prioritizing sugar cane, rice, citrus plantations, Cuba neglected it's domestic food consumption, forcing it to rely on imports from the Soviet Union.

After the collapse of the Soviet system in 1989, Cuba found itself in a tough situation, an economic crisis, with its food security being threatened. Cuba was thrown in a food crisis, due to the loss of imports from the Soviet block.

Havana, Cuba's capital and largest city, serves as a model replicated throughout the country, being the hardest hit city and being able to regenerate socially, economically through urban agriculture. It transitioned from largely scaled, highly intensive, exotic, single crop plantations to small scale, largely diversified, organic or semi-organic farming system. Food production was decentralized, local markets with a short distribution chain were encouraged.

A big step in promoting urban agriculture was the creation of an Urban Agriculture Department. It implemented a series of different projects in coordination with NGO's, research centers with the goal of using all of the city's unused space for production. This included: vacant lots, rooftops, balconies, terraces, etc. It's first policy was to establish land use rights for farmers. They would request a specific plot to the local government, typically in the area where they reside, and the local municipality would grant them that specific plot with a lease contract, with the condition that the plot was used for production. If the demander was a cooperative, the state would also provide infrastructure, such as a sales kiosk, tool shed, irrigation system and startup loans.

Another step was creating agricultural extension services, which are organized to respond and serve the needs of farmers. They offer assistance and knowledge to farmers, as well as means to monetize their yields by providing information, promoting agricultural techniques, providing access to infrastructure, coordinating logistics, and offering educational workshops. Also, they organize the community by encouraging members to associate with nearby groups, as well as integrating new members into the food network.

Previously all food was bought and sold through government stores. After the bills have passed the government allowed food to be sold on sites or on farmer's markets so that the logistic chain would shorten or be non-existent. The food would be always fresh and the distribution chain would shorten.

The city farms and gardens were organized into five main categories [1]:

Huertos Populares (popular gardens): cultivated privately by urban residents in small parcels all over Havana (Fig. 1).

Organicoponicos and Huertos Invensivos (intensive gardens): Gardens in raised container beds with a high ratio of compost to soil, run by a state institution or by private individuals (Fig. 2).

Autoconsumos: Self-provisioning gardens that belong to and produce for the workers. They usually supply the cafeterias of a particular workplace, an institution: hospitals, factories and schools.

Campesinos particulares: individual small plots cultivated by farmers, largely working in the peri-urban, greenbelt around the city.

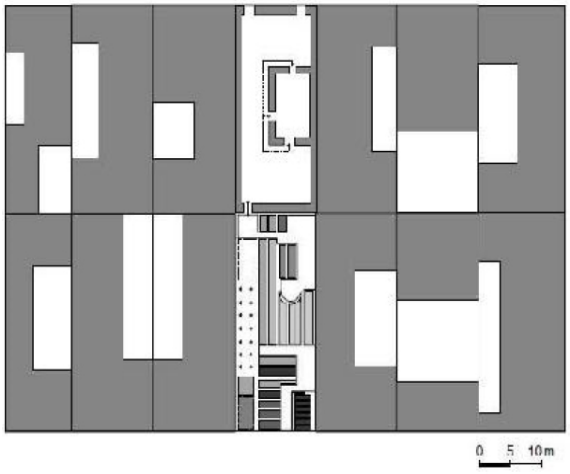

Fig. 1. Temporarily occupying vacant lots for the community in Havana - Huerto Comunitario [2]

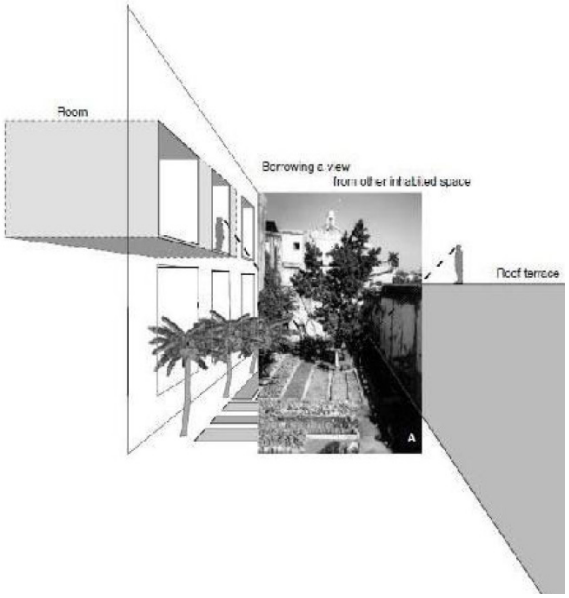

Fig. 2. Representation of Huertos Intensivos [2]

Empresas estatales: large farms run as state enterprises, many with increasing decentralization, autonomy and degrees of profit shared with workers.

Havana has a compact city core, which de-compacts towards the edges, with small plots dispersed through the city center. Larger sites for urban agriculture tend to be found at the edge of the urban fabric or adjacent to major roads.

In their work, "Continuous productive urban landscapes" [2], Andre Viljoen and Katrin Bohn researched how big urban agriculture plots need to be in order to provide full-time employment and to be economically viable. Of those mentioned above, the most productive and probably most representative are the organicoponicos, with yields up to 20kg/sqm/yr. They require at least 500 sqm and imported soil and containers. Organicoponicos are raised container beds 120 cm wide with 65 cm left for paths placed fully above the ground with a soil mixed with compost or manure, suitable for paved areas, or areas where the soil isn't fertile. Usually, the produce is consumed by the farmers, or sold at the farm door locally.

An interesting approach used by the Cubans was using vacant lots in the middle of the urban fabric to temporarily occupy a site for community garden (huertos populares). Although the space isn't enough for large scale urban agriculture, it is large enough to create a social, communal space. Such examples we can find throughout Havana.

In a very short period Cuba increased its food yield, shortened its distribution chain, managed the food security crisis and changed nutrition habits, primarily of the disadvantaged population (in some regions urban agriculture provides 30% of the calorie intake). Its success relies heavily on policy making, the education programs working closely with the population and the will of the community to be involved with farming.

Urban agriculture in Cuba accounts for a large percentage of the total agricultural production (Fig. 3) [3].

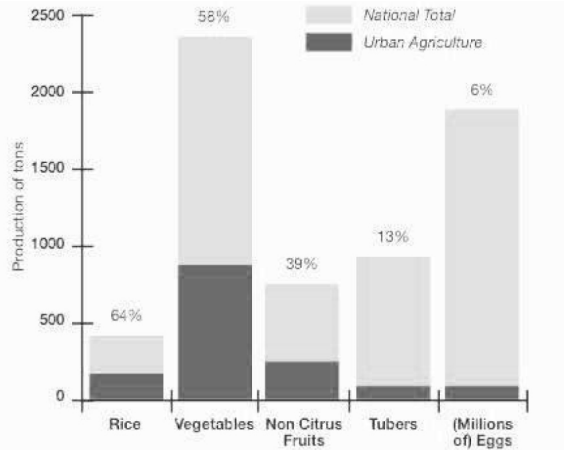

Fig. 3. Urban Agriculture as a Percentage of Total Production [3]

III. CASE STUDY: NEW YORK CITY

New York City is one of the most densely populated cities in the United States with a population of approximately 8 million people in 5 boroughs. The high price of land makes urban farming seem an inadequate concept but given that urban agriculture relies heavily on local capital, and support from communities who need a healthy lifestyle, food and diversity, this is the perfect place for this movement to flourish.

In this case, the urban agriculture approach is a way of understanding how agriculture works in a synergetic relationship with the city and urban environment, generating a new urbanism movement and a new type of continuous and productive urban landscape (CPUL).

Urban agriculture, in the case of NYC has the capacity to solve a series of problems that the population is facing.

There are many areas where convenience stores, and discount stores that have the major food retailers, are not selling fresh and nutritious produce. The difficulty also comes from the fact that very few inhabitants have a car, so moving to other areas of the city is difficult, but as a solution, a program has appeared that offers tax relief helping small businesses that develop in these areas, and the development of urban farms. In these areas the situation has improved. Recent studies reveal that the percentage of NYC residents suffering from obesity and diabetes is much higher than the national average. The communities that suffer the most from this disease are situated in low income neighborhoods, which suffer from social inequalities situated usually near vacant lots in the city, which are unable to access fresh, healthy food [4].

An environmental issue NY is facing is high temperature in the urban area, which can be up to 12 degrees higher than that in the surrounding rural areas. As a solution, increasing the amount of vegetation is one of the best ways to change the thermal balance, where the ground allows it. Shading and vegetation block and redistribute solar radiation. Many areas, however, are completely paved, leaving only roofs as a possible additional green space for greening the area. If we can think about a solution applied on a large scale, local farms on roofs could help lower temperatures and significantly cool the urban environment.

This new approach to planning, described in a study done by Urban Design Lab Columbia University, begins with Identifying the availability and spatial distribution of land suitable (soil degradation, water management composting and waste management, energy consumption) for farming in the city [5].

Often, different issues can emerge which require political support from local municipality and cultural support from involved communities.

Available spaces in the urban fabric include vacant lots: belonging to the public administration, to the state or agencies and private land, free of construction.

Public vacant lots.

The approach involved an analysis on the distribution of these spaces in each area of the city, then pondering if it is suitable for immediate real estate development based on the site dimensions and neighborhood needs. Public vacant lots are best suited for this kind of practice because they can be assigned to specific uses through municipal policies; the approach being simple, thus increasing the political involvement in such actions. Encountered problems in this case are:

-the use of water - for public properties costs would be taken care of by the parks and recreation department, which deals with the management and support of agricultural planning in the urban environment. In some situations water was used from hydrants, but for large-scale applicability the department could find different solutions.

-soil contamination: in some situations the solution was to bring soil and excavate the existing one, or use compost beds on the existing soil or biological techniques that require a longer duration, but are done at reduced costs.

-a social problem: the change in zoning regulations or an interest in building on the specific site can spark community opposition which grew attached to its community garden

Private vacant lots.

The decision is made to include tax incentives or even tax exemptions, considering that the state

has a profit and the surrounding land becomes more valuable. A good example is in San Francisco where private individuals that obtain
permits, but do not have a budget to start work in time can obtain extensions to permits if they allow urban agriculture to be practiced temporarily on their land.
The public spaces with private capital can benefit from the exemption of the state taxes in exchange for making it available to the public for practicing agriculture on at least 50% of the plot area. Brightfarms, for example, are building greenhouses on top of supermarkets, shortening the distribution chain.
The land owned by schools or areas with which is directly adjacent
There are 285 schools and kindergartens from which some offer a wide range of opportunities regarding teaching students about food security, food waste and sustainable environment.
Parking lots.
The green infrastructure plan involves the conversion of sites with parking destinations into other forms of green infrastructure, although these are an asset in a large city, they involve very large paved surfaces leading to disproportionate rainwater runoff.
Green streets.
The lack of studies that indicate the influence of pollution on the growth of food in areas in the immediate vicinity of the major arteries or along the squares.
Open space.
Recreational green spaces could include small-scale proposals to familiarize residents with the concept of community garden, especially in neighborhoods with inhabitants with lower incomes. In 2008, an analysis showed that NY has a courtyard area almost equal to the surface of other green open spaces.
Green roofs.
Green roofs could come as a solution for reducing the amount of rainwater by retaining between 52% -100% precipitation. Green roofs can also retain heavy metals especially in areas with high air pollution.
Due to the density and high price of land in NY roof farming is a common practice. For larger production it should be considered:
-a structural analysis of the building; buildings not older than 1900, because after 1970 the construction regulations were tightened and the roofs would withstand a greater weight,
-the type and the way of accessing the roof,
-the size of clearings, agriculture being more profitable the practice on a larger surface;
-it should have a maximum of 10 floors, because at high altitude the climatic conditions change;
-taking into accountthe solar map, for an adequate exposure in crop culture.
Identifying the quality of the soil.
After the selection of desired space for implementation, a soil study is requested. It will establish the necessary interventions depending on the quality and level of contamination of the soil, and the economic implications. Composting is well suited for urban agriculture due to the large paved areas and lack of nutritious soil.
This methodology was applied for Bronx District 3 (Fig. 4), defined by an eclectic use of urban fabric with manufacturing in the west, several large collective housing buildings in the south, small collective housing in the eastern part. This district houses an ethnically diverse population of 77,572.

Fig. 4. Site availability Bronx District 3 [5]

380 vacant lots were identified, with the potential for development of urban farms, like: spaces in

playgrounds which lacked greenery, being mostly paved; parking spots used as storage spaces; roofs which had access to public space, small vacant lots between buildings, residual spaces near important transportation infrastructure.

IV. THE CONCEPT OF CPUL's

In "Continuous productive urban landscapes" [2] Andre Viljoen and Katrin Bohn define the term of CPUL through a new vision of the city's landscape. The concept of "productive landscape", more precisely through agriculture in the urban environment, which belongs to the unconstructed, the non-city. They see the unbuilt space of the same intensity as the built one, one with cultural and ecological value.

A productive landscape alongside acupunctural interventions can make up green networks defining continuous urban productive landscapes. The productive landscape is reborn as a consequence of several critical factors for the sustainability of the urban environment: public health, access to healthy food, green spaces, air and water quality, economic development and social involvement. CPULs offer spaces for leisure, for social interactions, for education, and physical activities. It will cover all of the city, from its core to its edges. It will traverse all of the city's open spaces and will link it to the surrounding rural areas. And its design will primarily focus on the pedestrian.

V. CONCLUSIONS

Implementing urban agriculture in the two case studies mentioned above was due to somewhat different needs: the one in Havana was due to food shortage, and the one in New York was due to inaccessible nutritious food and lack of green social spaces.

In both cases we observed that the local or regional government played a big part in the success of urban agricultural gardens.

Not only did it serve it purpose (access to healthy food) but urban agriculture had many more other effects: it promoted local interactions in the area, it beautified the local environment, it created a variety of occupations (farming, cooking, leisure), it involved a variety of different occupants (schoolchildren , gardeners, elders), for some it provided a means to sustain themselves financially.

Most importantly, this concept of synergetic agriculture raises awareness of the connections between how and where food is grown and how it impacts our health and environment. It favors a smaller-scale alternative to the industrialized food system.

Urban agriculture should constitute a permanent or temporary layer in the fabric of urban green space and find its role in linking not only different functions within the city core, but also linking the city with the surrounding landscape.

REFERENCES

[1] C. Murphy, CULTIVATING HAVANA: Urban Agriculture and Food Security in the Years of Crisis. Institute for Food and Development Policy, 1999.

[2] A. Viljoen, K. Bohn and Joe Howe, Continuous productive urban landscapes: Designing urban agriculture for sustainable cities. Elsevier, Architectural Press.

[3] „Food production in the community by the community and for the community: Urban Agriculture in Havana (Cuba)", Urban Agriculture Magazine, vol. 1, no. 1, 27-29, June 2000.

[4] H. de Zeeuw and P. Drechsel, Cities and Agriculture: Developing Resilient Urban Food, Systems. Routledge.

[5] R. Plunz, M. Conard, R. Katz, E. Dahlgreen and P. Culligan, „The Potential for Urban Agriculture in New York City, Growing Capacity", in Food Security & Green Infrastructure, Urban Design Lab. Columbia University, 29-43