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Havana's Urban Agriculture: productive land-scapes within a city's crumbling infrastructure

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ABSTRACT: When Cuba found itself abruptly cutoff from trade with Soviet bloc in 1989, the country spun into an economic crisis of unprecedented severity. Suddenly lacking the oil, pesticides, and machinery with which to grow crops, and without access to the imported food that had previously sustained it, Cuba's foodshed suddenly caved. Nearly twenty-five years later, this food crisis has vanished almost as swiftly as it arrived, in no small part due to the country's innovative and widespread urban food production efforts. This research addresses the urban design framework that Cuba created in order to support urban agriculture initiatives, and suggests ideas, opportunities and innovation that could inform the development of productive landscapes in other parts of the world.

Almost a dozen distinct types of urban farming approaches are visible in Havana, Cuba; these forms are a direct response to the 1989 food crisis and reflect the flexible modes of self-provisioning that followed. These farm types also expose the context, constraints, and cultural norms unique to Havana's urban environment, revealing changing attitudes towards urbanism in Havana's capital city. At the same time, this urban agriculture system can be distilled into a readable organizational taxonomy; a kit of parts approach to food production that could well translate to other parts of the world.

With natural and man-made disasters increasing in both frequency and severity, architects, landscape architects and planners can help cities plan for resilience by identifying replicable methods for self-sufficiency. This body of research focuses on the model urban farming programs underway in Cuba, which demonstrate self-sufficiency and food security in an oil-scarce environment. The goal of this paper is to share Havana's innovative urban agricultural interventions: food provisioning solutions that have been tested over the last twenty-five years and could be reproduced in other political and climatic zones.

KEYWORDS: Havana, Cuba, Urban Agriculture, Post-oil, Food Security

INTRODUCTION

Global climate change and a dwindling world supply of oil threaten to erode the habits and systems that require consumption of and dependence on fossil fuels. Meanwhile, agriculture has, over time, become increasingly reliant upon these oil reserves, from crop harvesting and irrigation to the transportation and refrigeration of foods, and even pesticide and fertilizer production. As cities and towns prepare for a post-oil future, they necessarily must decouple food production from oil reliance, and through this process, redesign their regional foodsheds.

While food security hasn't traditionally been considered the domain of architects and planners, practitioners are quickly recognizing the value of engaging across disciplines with these infrastructures and systems. Designers bring an important lens to urban agriculture, where food production must be applied onto extant urban fabric. Landscape Urbanist Charles Waldheim reminds us that this work presents both social and physical opportunities, and suggests that "...architects and urbanists grapple with the implications for urban form attendant to their renewed interest in the agricultural." (Waldheim 2010, 18)

As architects, landscape architects, planners and educators look for tested models addressing the sister issues of scarcity and food security, the progressive urban farming work stemming from Cuba's Special Period stands out as a rare and important precedent. Widely understood

to be “one of the most successful examples of urban agriculture in the world,” Cuban urban farming incorporates grassroots organizing, the appropriation of public space for growing, and shared technical and educational support. (Koont 2009, 1) This surprisingly effective movement stands in stark contrast to other wartime or post-disaster environments, with outcomes ranging from widespread self-sufficiency and profound community engagement to environmental remediation and improved stewardship. Moreover, this Cuban model highlights a number of infrastructural, social and political features that could be applied to other areas.

RESEARCH METHODS AND APPROACH

1.1. Field Documentation and Interviews

Cuba is undergoing rapid change under the leadership of Raúl Castro, and because of government control, information about many of these programs is nearly impossible to secure without fieldwork. This research relies on site visits to gardens and farms in Havana, including photographs, mapping, and interviews at those locations. A variety of different Cuban leaders contributed to this research, including professors from the architecture school in Havana, city planners, permaculture leaders, government agronomists, and journalists. Interviews with farmers and urban growers have provided worker's viewpoints. Finally, several state-sponsored organizations, including the National Urban Planning Office, the Provincial Urban Agriculture Department, the National Group of Urban Agriculture, the Association for Organic Agriculture, *Fundación de la Naturaleza y el Hombre*, and the *Patio* and *Parcela* Movement facilitated the gathering of data.

1.2. Literature Review

Although Cuba's food landscapes have not been studied in depth by architects, landscape architects or planners, many other disciplines have published significant scholarly work on this topic. The literature reviewed for this paper was purposefully broad and interdisciplinary, in order to promote a more holistic understanding of the issues, factors and approaches to urban farming in Havana. These texts include blogs, papers, books and articles written by Cubans as well as foreigners, and farmers as well as academics, with a focus on the last thirty years.

1.3. Inventory of Farm Types

This paper identifies the physical structure of urban agriculture in Cuba, including growing areas and support services. Using the official state language for farm types, and on-site analysis of different farming components, a taxonomy of urban farms was developed. With an emphasis on Havana and the last twenty-five years of urban farming in Cuba, this paper categorizes nearly a dozen different approaches to urban farming and simultaneously explains the myriad factors (social, cultural, environmental, and political) that have shaped such a robust country-wide initiative.

BACKGROUND

1.1 History

In 1989, the Cuban government abruptly lost an important trade ally with the dissolution of the Soviet bloc. Already isolated from world trade due to the U.S. sponsored trade embargos, Cuba became, almost overnight, cut off from the rest of the world. In the years that followed, the country was both incapable of effectively exporting sugar and citrus crops, and unable to import critical staples. This period became known as Cuba's food crisis, in which most Cubans lost access to roughly one third of their daily calories, there was widespread hunger, and the government instituted a peacetime austerity program for food rationing.

Beyond the overwhelming reduction of food-related imports, Cuba suffered from pervasive oil scarcity. One of the major motivations for turning to urban farming was that transportation in Cuba became very limited, as well as time-intensive and expensive. Growers had difficulty moving vegetables, meat and fruit to the tables around the region. In this sense, Cuba's food crisis was both political (in the case of trade embargos) and locational (people were stranded in a food desert). Although Cuba had become reliant on other countries for food provisioning,

its geography, history and political values actually pointed to a latent local foodshed. The island benefits from an ideal tropical coastal climate zone for growing, year-round crops, sizeable tracts of arable land, a strong post-1959 government, and a socialist appreciation for agriculture and self-sufficiency.

Presented with a near collapse of its food provisioning system, the Cuban government responded with an overhaul of agricultural systems on the island, preferencing organic farming, useful edible crops, and peasant labor. In urban areas, guerrilla gardening initiatives blossomed into new state-supported urban farming programs, with widespread voluntary participation. Grass-roots farming efforts, combined with the enthusiastic support of the state, has led to a robust urban farming program across the island. (Altieri and Funes-Monzote 2012)

1.2 Today

Havana is an exemplary model for this type of self-provisioning, and a useful precedent for individuals seeking to understand the opportunities and obstacles for transference. The city has more than two million people, many universal or ubiquitous infrastructural elements, and an urban form more like New Orleans than other cities in the Caribbean. In an effort to bring food production into the city, agricultural initiatives were necessarily layered over, and knitted into, existing urban fabric. From a design perspective, Havana's urban agriculture can read as an afterthought or a stop-gap measure, rather than a considered and intentional design process. This practice of urban acupuncture, however, is perhaps its most salient design feature, demonstrating that productivity can be introduced and infused into hardened urban wastescapes.

In the context of this paper, Havana provides an example of a systematic approach to rethinking urban landscapes for more productive means. Today, Havana has a unique food production infrastructure woven into its contemporary city form, including 475 large state farms, 318 livestock farms, 179 *organopónicos*, 418 high production orchards, 28 seedling production centers, 324 greenhouses; 162 *Autoconsumos*, 7,848 *parcelas*, 34,970 *patios*; 126 forest farms, 67 cattle farms; 52 different agricultural stores, 3 compost production sites; 7 centers for the production of entomophagous and entomopathogenic (CREE) and 40 urban veterinary clinics. (González 2008, 24) Professor Sinan Koont estimates that "more than 35,000 hectares (over 87,000 acres) of land are being used in urban agriculture in Havana!" (Koont 2009, 1)

THE FORM OF URBAN AGRICULTURE

Urban agriculture in Havana occurs at a host of different scales, from the balcony garden to the multi-acre fields that comprise Havana's greenbelt. These gardens also have a range in terms of production, from highly-productive enterprises to pleasure gardens, and varying degrees of state support and recognition. Havana's urban gardens typically produce food for human and animal consumption, although the same formal structure of gardens also supports the production of compost, biofuels and animal husbandry.

Many of these gardens have emerged somewhat opportunistically from vacant and blighted properties within the city, exploiting usufruct rights (free land provided by the government, indefinitely) to seize available space. Professor Sinan Koont notes that in Havana, "Plots that had become eyesores and informal garbage dumps have been transformed into productive land." (Koont 2009, 3) According to scholar Orlando Acosta Mirrelles, this unproductive urban land is rapidly running out. In Havana, of the 35,890 hectares of unutilized, cultivable land "all but 2,970 hectares were already in use as pastures, forests, and croplands as of November 15, 2006." (Mirrelles 2006, 14) Regardless, the state continues to identify underused landscapes, including polluted wastelands and informal dumps, as sites for productive urban agriculture.

The organization of Cuban agriculture can be understood in terms of state-sector farms and non-state sector farms. (Martín, 2002) State-sector farms include New Type State Farms (GENT), Revolutionary Armed Forces (FAR) farms, including farms of the Young Workers' Army (EJT) and the Ministry of Interior (MININT), Self-provisioning farms at workplaces and

public institutions, Basic Units of Cooperative Production (UBPC) and Agricultural Production Cooperatives (CPA). Non-state sector farms include Individual Production Credit and Service Cooperatives (CCS), individual farmers, using both usufruct and private property, and mixed sector joint ventures between the state and foreign capital.

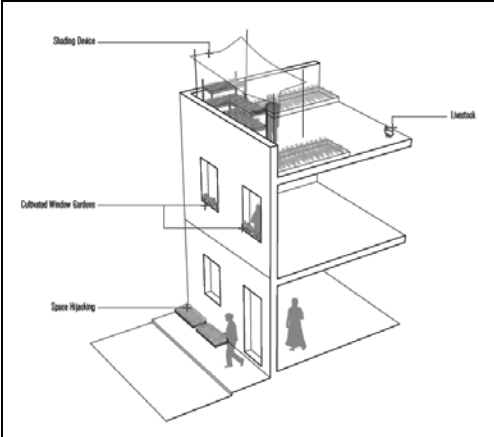


Figure 1: Micro-garden. Source: Jade Jiambutr

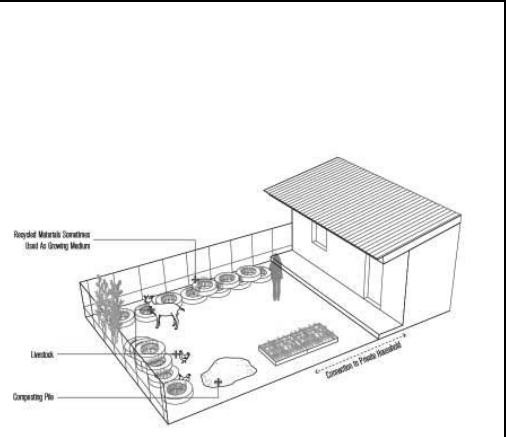


Figure 2: Patio. Source: Jade Jiambutr

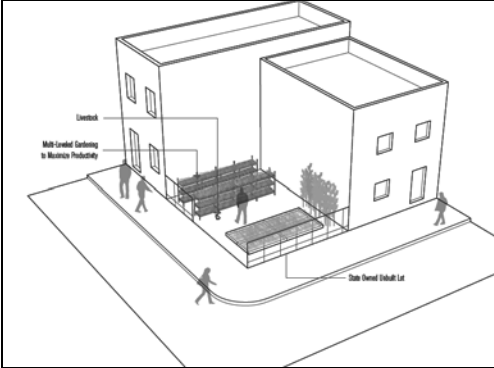


Figure 3: Parcela. Source: Jade Jiambutr

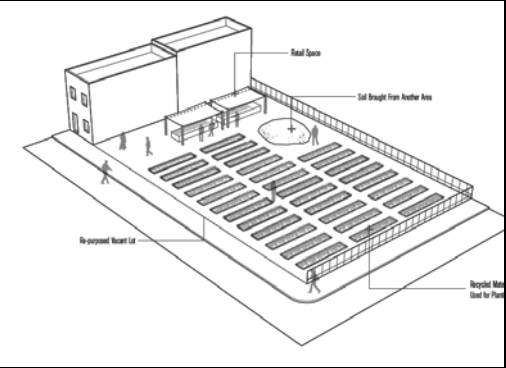


Figure 4: Huerto Intensivos. Source: Jade Jiambutr

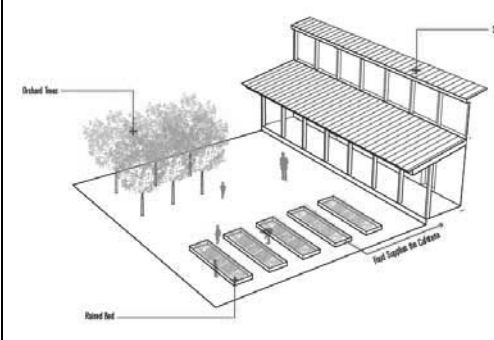


Figure 5: Autoconsumo. Source: Jade Jiambutr

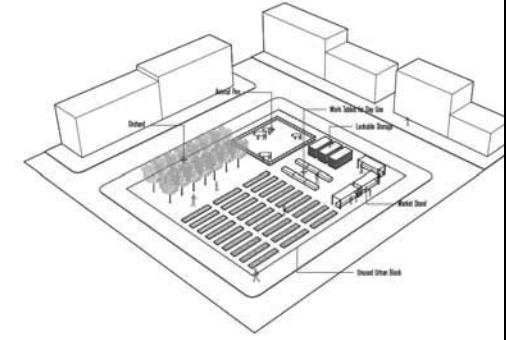
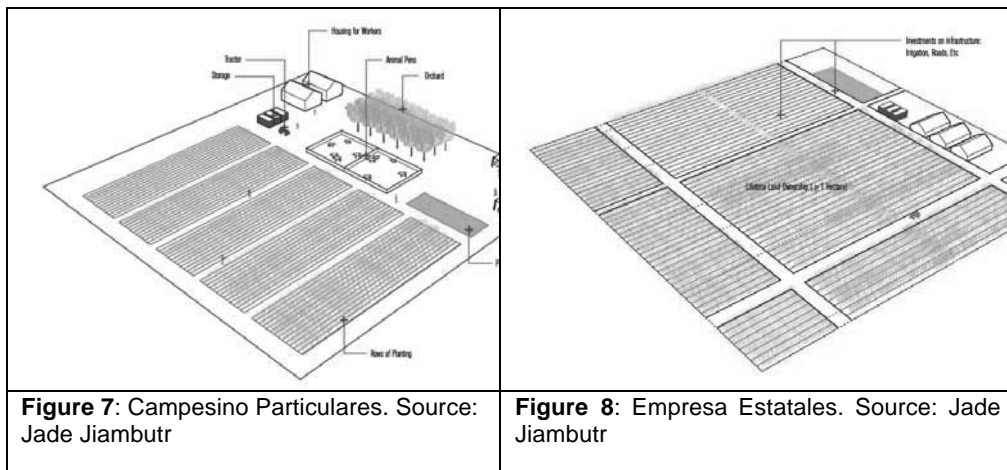


Figure 6: OAR. Source: Jade Jiambutr



FARM TYPES

While the heterogeneity of each plot ultimately stems from site constraints and a grower's needs, most urban farms fall into one of the following four groups: *huertos populares* (popular gardens), *autoconsumos* (institutional gardens), *organopónicos* (cooperative gardens), and *empresas estatales* (state enterprises). The following farm types comprise the taxonomy of urban agriculture in Havana today: (Clouse: 2014)

Micro-jardines, or Micro-gardens, are typically less than 100 m² in size, and produce spatially efficient crops, such as herbs and container tomatoes, or small livestock, such as rabbits, guinea pigs, and poultry. Micro-jardines include planter boxes and potted gardens—the smallest-size garden types in Havana—which are found predominately in the dense central core, where outdoor space is limited. This type of garden is typically privately owned and worked by one person, for his or her own immediate consumption. Plastic or metal bins hold the growing medium and gardens are often made up of repurposed containers placed on racks, rooftops, or concrete surfaces. Some public space appropriation occurs at this scale—most often between the sidewalk and the street, where fruit and nut trees or tiny crops, such as herbs, are grown. (Figure 1)

Patios are Yards, typically less than 1,000 m² in size, which produce tubers and *viandas*, vegetables, grain, fruits, small livestock, such as rabbits, sheep, goats, and poultry. Often of a small scale, these gardens fit into underused or leftover spaces and can be easily managed by an individual. The proprietor grows items that are particularly suited to existing site conditions, such as soil type or the amount of available sun or shade. The proximity of patios to those who tend them shortens the distance between farm and table and also eliminates the need for commuting laborers. (Figure 2)

Parcelas are lots, typically less than 1,000 m² in size, which produce tubers and *viandas*, vegetables, grain, fruits, small livestock, such as rabbits, sheep, goats, and poultry. Parcelas are formed with usufruct land from the government. They could include playing fields, portions of public parks, and abandoned lots, but are generally small- to medium-scale gardens carved out of underused urban lots. They are usually worked by an individual or small group of growers, who produce for their own immediate consumption. The shape varies from the very private adjacent lot—indistinguishable from the yard—to a much more public garden. (Figure 3)

Huertos Intensivos, or Intensive Cultivation Gardens, range in size from 1,000–5,000 m², and produce fresh vegetables for public and private use. Larger than parcelas but often still operated as independent businesses, huertos intensivos are single lots under cultivation by private collectives of growers. These medium-sized farms are located throughout the city, often employing state-owned land that was once vacant, a field behind a public building, or a piece of a public park. These farms typically are large enough to require multiple employees and can

sustain those employees and their families. Many of these farms specialize in a few different vegetables or products. After donating a portion of the yields to the state as a tax, the farmers then can legally sell their produce at markets for profit. (Figure 4)

Autoconsumos, or Self-provisioning gardens, produce food, usually vegetables and fruits, for self-provisioning institutions. *Autoconsumos* are gardens physically connected to a school or a workplace and are farmed by their employees to support the needs of the cafeteria at the institution. These gardens augment the cafeteria food that the government must provide for each institution, while ensuring that fresh produce will be incorporated into these meals. These gardens represent the efforts of each institution to support socialist ideals by being productive at multiple scales. Because *autoconsumos* are hosted by state-run organizations, these growing areas represent solidarity with the country's dispersed and prolific food security scheme. (Figure 5)

Organopónico de Alto Rendimiento (OARs), or high-yield urban gardens, range in size from 2,500 m²–20,000 m², and produce vegetables, such as lettuce, spinach and radishes, cooking herbs and spices, eggs, and fruits, for public and private use. OARs characterize the most common large-scale farming efforts within the city's limits. These farms are usually found on infill sites near housing developments and stretch across entire city blocks. (Figure 6)

Campesinos Particulares, or Private Peasant Gardens, range in size from 5000 m²–80,000 m² per farm, and produce soil, nursery, tree farms, flower farms, multi-crop farms, some animals, *viandas*, vegetables, grain, spices, flowers, soil, tree saplings, honey, and fruits for sale. Located primarily in the green belt or peri-urban areas, these farms have the physical structure of rural counterparts. (Figure 7)

Empresas Estatales, or State Enterprises, produce vegetables, cooking herbs and spices, eggs, fruits. Orchards include varieties of banana, coffee, mango, coconut, avocado, and trees for wood and shade. *Empresas Estatales* are businesses owned by the state. There are two state-owned companies in Havana: one deals in livestock and the other in orchards for vegetables and fruits. (Figure 8)

THE ROLE OF DESIGN

1.1 Limited Professional Roles

Designers such as planners, architects and landscape architects have historically played a limited role in the development of agriculture systems. According to scholar Charles Leshner, "professionals in urban landscape, ecology, and design are not including urban agriculture into their catalogues of urban assets." (Leshner 2008, 64) While food production has been disassociated from the design disciplines in the past, it is increasingly becoming relevant in the urban context. As societies begin to consider new forms and types of farming, designers could help to shape that work, especially in urban areas.

In the context of post-oil survival, the design disciplines could present useful agendas, advocacy and strategies for envisioning future cities. Architects, landscape architects and planners are poised to help ease the transition to a post-oil city, by visualizing new forms of farming, developing new technologies, systems and materials, and working to connect farming to contemporary city life. Traditionally, designers have acted as the gatekeepers for public space shaping; indeed many of the same issues that affect urban spaces also impact urban farming. For instance, food production in cities has the potential to be form-based, affordable, efficient, visible, and to represent the interests of all citizens.

Moreover, designers could benefit from opening up new terrain in their field, as well as new forms of interdisciplinary work. Engaging in the design of urban food systems would highlight broader issues of food security, thereby expanding the field. As the design disciplines move from largely aesthetic conversations to topics of utility and resilience, this kind of work serves to increase the relevance of the profession.

1.2 Obstacles

Political support is perhaps the greatest barrier to adopting new forms of urban agriculture in cities. Without access to affordable land and agricultural education, growers can hardly be expected to produce healthy and stable urban farms. Scholar Kathryn Peters reminds us that “Victory gardens and local sustainable agriculture reduce dependency on the established food production system, but, because the U.S. population is clustered in densely populated metropolitan areas, the majority of the population lacks access to land on which to grow food.” (Peters 2010, 205) While the design disciplines must adapt old models for food production to new urban surfaces, they cannot gain traction for such endeavors without government support.

1.3 Integrating Urban Agriculture into the Classroom

Perhaps the logical starting place for such a disciplinary overhaul would be in the classroom; it is here that design students (future professionals) develop their understanding of professional norms and their own design values. Design education could seed the topics of food security, productive landscapes, and climate change adaptation by exposing students to a much broader array of design precedents and attendant real-world issues. Indeed, urban agriculture, once marginalized as a topic relegated to fledgling non-profits and agriculture extension agencies, has recently surged in popularity, in no small part due to the activism of emerging design professionals.

CONCLUSION

Cuba's innovative approach to urban farming provides a blueprint for urban food security, with a host of formal recommendations that could be useful in other areas. While not originally planned into the city fabric, this country-wide initiative suggests logical land-use transitions, provides a model for agricultural education and offers up a variety of new formal garden typologies. Perhaps most importantly, Cuba presents a useful case study because the country has endured a food crisis brought about by oil scarcity, and has thrived.

A large-scale conversion to urban agriculture demands a shift in cultural and social values while also triggering concomitant formal and physical changes. Professor Alex Wall suggests that new forms of landscape urbanism must be “targeted not only toward physical but also social and ecological agents.” (Weller 2006, 79) Part of this transformation entails a disciplinary shift, through design, while another part of it is political and social, a shifting of language and thinking around what the city can and ought to be. A good example of this transformation can be found in Havana's masterplan, which identifies a planning typology called a ‘Food Park.’ This new terminology illustrates the enlightened thinking of planners and residents, and suggests a way forward for other parts of the world.

Indeed, the urban agriculture practiced in Havana provides an important model for any city transitioning towards food independence. As global warming intensifies and energy, land and water reserves diminish, many see the value in a return to locavorism and the development of more resilient food systems. Cuba's model---affordable, accessible, comprehensive, and de facto organic---could be particularly instructive for other nations seeking improved food security. And while Cuba was forced to innovate due to the food crisis of 1989, other countries have the opportunity to develop their own self-sufficiency before such a crisis unfolds. With the pressing threat of climate change waiting in the wings, designers have a responsibility to engage, perhaps by helping cities retrofit urban food systems for self-sufficiency.

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