CULTIVATED EDGE: Mediating rural and urban gaps in informal settlements

Camila Hellebuyck

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CULTIVATED EDGE

Mediating rural and urban gaps in informal settlements
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Request for Approval of Thesis Research
Project Book Presented to:
Ermal Shpuza

and to the Faculty of the Department of Architecture
College of Architecture and Construction Management

by Camila Hellebuyck

In partial fulfillment of the requirements for the Degree of Bachelor of Architecture
Kennesaw State University
Marietta, Georgia

Spring 2018
DEDICATION

I would like to dedicate this book to those who have contributed to my journey through Architecture School and have inspired me to fulfill one of my biggest accomplishments.

To my family, Eliana Orozco, and Aldo Hellebuyck, thank you for the encouragement and unconditional love I received to achieve this objective. I couldn’t have done it without your support.

To my architecture family and friends, thank you for filling every day with happiness and laughter, even through the most stressful times.

To Juan Chirinos, thank you for doing what you do best, pushing me to my greatest potential and for being my companion through our years in school.

ACKNOWLEDGEMENT

This Thesis would not be possible without the support and guidance of my thesis advisors:

Professor Ermal Shpuza, thank you for sharing the knowledge you’ve gained through your experiences, and for the commitment you had with this project.

Professor Pegah Zamani, thank you for the constructive criticism that always pushed my project further.

I would not have accomplished my professional degree without the guidance of the Faculty at Kennesaw State University, and the support of my scholarship donors, the Goldgeier Family and James G. Fausett, who I will always be thankful for.
Usually when you think of agriculture, you think of a farm, of production and of profitability and not on how can cities benefit from these practices, specially informal settlements. Urban agriculture is practiced almost as a hobby in industrialized nations, but it’s a response to a need in developing countries. In the case of Ciudad Bolívar, an informal settlement on the edge of Bogota, Colombia, urban farming resulted from food scarcity and poverty. The project develops design placemaking strategies aimed at improving the built environment and, as a result, the social cohesion of the neighborhood. The thesis proposes a community where agriculture is introduced at the initial stages of the design process, with farming gardens, food markets, and a community hub that coalesce into a performative edge and mediate between the rural and urban worlds. An edge that creates a more connected and livable community, one that harvests tradition.
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Bring social and economic development to displaced communities in slums through the design of a performative agricultural edge, with the intent of improving current typologies in informal settlements that fail at establishing a community identity.
1.1 DESIGN HYPOTHESIS

What would our cities look like if we began to place food production/distribution as the primary focus of urban design? And what will it take to make this vision a reality? How will it affect food scarcity in slums?

In the case of Ciudad Bolivar, an informal settlement on the edge of Bogota, Colombia, urban farming resulted from food scarcity and poverty. This settlement was formed by farming families who migrated from rural territories to escape the country’s internal conflict during the last 50 years.

This project develops placemaking strategies aimed at improving the quality of the built environment by means of reviving the use of agricultural traditions of displaced families in informal settlements. The barrios in the outskirts of Bogota are studied in a two-fold manner: to understand the community needs and identity, and to gauge the potential of urban fabric for accommodating small and medium scale agricultural production. The proposal includes farming gardens, food markets, and a community hub that coalesce into a performative edge and mediate between the rural and urban worlds.

The people of Ciudad Bolivar, their existing needs and preserved agriculture traditions become the focus of my initial design strategies. Currently, displaced families present various scarce conditions that can be somewhat decreased with urban agriculture practices and inclusive design strategies. Decent work and economic growth, clean water and sanitation, food security and safety, inspiration and education, access to nature and place, access to community services, only to name a few.

If different garden typologies and practices were introduced into the physical environment, the social inequalities would be reduced and, as result, good health and well-being for the population.

This thesis explores different typologies where markets, farming gardens at various scales, and living spaces, can all cohesively create a sense of place.

Create places where the community feels ownership and engagement, and where design serves function, meeting basic human needs.
1.2 HISTORICAL CONTEXT

RURAL TO URBAN MIGRATION

Globally, more people live in urban areas than in rural areas. In 2007, for the first time in history, the global urban population exceeded the global rural population, and the world population has remained predominantly urban thereafter. The planet has gone through a process of rapid urbanization over the past six decades. In 1950, more than two-thirds (70 per cent) of people worldwide lived in rural settlements and less than one-third (30 per cent) in urban settlements. In 2014, 54 per cent of the world’s population is urban. The urban population is expected to continue to grow, so that by 2050, the world will be one-third rural (34 per cent) and two-thirds urban (66 per cent), roughly the reverse of the global rural-urban population distribution of the mid-twentieth century.

The global proportion of urban population rose dramatically during the twentieth century:

- 1900 - 13% (220 million)
- 1950 - 29% (732 million)
- 2005 - 49% (3.2 billion)
- By 2030 this figure is estimated by the United Nations to be 60% (4.9 billion)

Great differences between slums reflect local cultures and conditions, as well as accidents of history or politics.

INTERNAL DISPLACEMENT

Worldwide, in 2012, a total of 28.8 million persons were displaced from their homes due to generalized violence and human rights violations, while remaining within the borders of their countries of origin, the highest figure ever recorded. Based on the United Nations report, Guiding Principles on Internal Displacement, the international humanitarian aid community uses the following consensus definition for internally displaced persons (IDPs): "Internally displaced persons are persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border."

Globally, almost one-in-five IDPs reside in Colombia. Estimated at 5.7 million in 2013, Colombia’s IDP population accounts for 19% of the worldwide total.
INFORMAL SETTLEMENTS

Deprived areas around big cities can be known by various names including barrios, favelas, slums, shantytowns or zopadpattis. These slum areas can be found in or around urban areas in different continents across the world. A slum household is defined by the United Nations as a group of individuals living under the same roof lacking one or more of the following conditions:

– Access to improved water
– Access to improved sanitation
– Sufficient living area
– Durability of housing
– Security of tenure

Slums can also be a source of inspiration and highlight the ingenuity and resourcefulness of populations.

In 2001, 924 million people, or 31.6 per cent of the world’s urban population, lived in slums. The majority of them were in the developing regions, accounting for 43 per cent of the urban population, in contrast to 6 percent in more developed regions.

The informal economy accounts for $10 trillion per year, which means that if it were its own political structure, it would be the second largest economy in the world.
Slum areas in cities are a concentration of social and economic deprivations, high population density, high numbers of broken families, high unemployment, and economic, physical and social exclusion.

“What defines a character of a city is its public space, not its private space. What defines the value of the private assets of the space are not the assets by themselves but the common assets. The value of the public good affects the value of the private good. We need to show every day that public spaces are an asset to a city.”

In combination with specific needs provided by the Ciudad Bolivar residents through a public online database and the “Placemaking methodology” by UN-Habitat, a conclusion can be drawn of what aspects can be improved to better the social, economic, and cultural growth of the community. This methodology helps to advance the development of cities where people of all income groups, social classes and ages can live safely, happily and in economic security through steps that show communities can take to improve the quality of their public spaces.

1.3 PROPOSED PROJECT NATURE

Create Squares and Parks as Multi-Use Destinations

If public squares and parks are planned around major public destinations, they build local economies, civic pride, social connection and human happiness. These spaces serve as “safe havens” for a city, where people can find either breathing room and relaxation in a well-designed park space or in their danger zone habitats. These spaces can be used as “multi-use destinations” with many attractive and activities, which citizens can find common ground and achieve efficiency and economic recoveries can be achieved.

Build Local Economies Through Markets

Public markets have been at the heart of most cities since ancient times. Markets are traditionally the most productive and dynamic places in our cities and towns, where the exchange of news, politics and goods takes place and where people solidify the social ties that are essential to a healthy society. Markets do many things for cities, including but not limited to encouraging entrepreneurship, sustaining farmland around cities, and improving access to fresh food.

If public squares and parks are planned around major public destinations, they can build local economies, civic pride, social connection and human happiness. These spaces serve as “safety valves” for a city, where people can find either breathing room and relaxation in a well-planned park space or fear and danger in a badly-planned one. The most successful public spaces are “multi-use destinations” with many attractions and activities, where citizens can find common ground and ethnic and economic tensions can go unnoticed.

Design Buildings to Support Places

Buildings, with interesting interiors may be architecturally successful to some but it is the architecture that permeates outward beyond the facade and towards the street level where it engages the city that is the most successful because it is built with the human scale in mind. Buildings that engender government buildings and libraries do so that they engage their surrounding public spaces and foster more opportunities for interpersonal interaction.

Lighter, Quicker, Cheaper: Small, Experiment

On the other hand, big is not always better - or the only strategy. Small moves like creating places to sit, a sidewalk, a cafe, planning a community event, organizing a container garden or painting crosswalks all have positive effects on a community and its public space. Informal settlements in particular are already accustomed to lightweight, innovative strategies that can rethink their environment, so implementing small changes here and there can really add up.

The importance of offering a variety of things to do in one location — making a place more than the sum of its parts. For example, a park should not only be a park, but a park with a fountain, playground, food vendor, etc. If a neighborhood has exclusively parks on the right tracks, but not on the left tracks, then our neighborhood fails in this respect, which should be guaranteed excellent public spaces within walking distance of their homes.
In 1989, over 55% of Cuba’s caloric intake was imported from the Soviet Union. When it collapsed, Cuba became, virtually overnight, solely responsible for feeding its population – including the 2.2 million in the city of Havana. Facing a massive food shortage, the citizens of Havana did the only thing they could – take their lives into their own hands.

On balconies, terraces, backyards, and empty lots, neighbors began planting beans, tomatoes, bananas – anything they could, anywhere they could. In the span of two years, there were gardens and farms in every neighborhood in Havana.

Today, urban agriculture is a national priority and in the capital, 90,000 people are engaged in cultivating home gardens or even raising goats in municipal parks. In 2013, this activity produced 6,700 tons of food for 300,000 people in schools, health centers and hospitals.

In Fig 1.4.1, we see the different types of gardens and their features. From micro-gardens on rooftops to intensive cultivation gardens in empty lots, urban agriculture has taken root in Havana, demonstrating resilience and innovation. 
The architecture has been conceived for economic construction using simple materials and modular parts. The concept offers multi-dimensional benefits related to economics, food security, and quality, social engagement, health, sustainability, place making, and healthcare provision. Home Farm adapts a simple aquaponic system inspired by that which has been successfully used in Singapore by rooftop farming initiative ComCrop using off-the-shelf components. At Home Farm, aquaponics have been adapted for use on the building façade. Soil-based farming is proposed for linear planting beds at the highest levels, as well as the rooftops of facilities buildings.

A conceptual project that blends affordable retirement housing with urban farming. The proposal, titled “Home Farm,” integrates vertical aquaponic farming and rooftop soil planting with high-density housing designed for seniors that provides residents with a garden environment and opportunities for post-retirement employment. Jobs for seniors at Home Farm could include planting, harvesting, sorting, packing, tours, on-site sales, delivery, cleaning, and so on. Possibilities for the remuneration of Home Farm’s resident workers could include payment of salary, offsetting rental or utilities bills, offsetting healthcare costs at the on-site clinic, or free produce.

Currently Singapore imports over 90% of its food. Singapore’s agricultural sector produces primarily eggs, fish, poultry, and vegetables. Ornamental fish and orchids are produced for export. Singapore’s high dependency on food imports makes food security a very prominent issue.

- Enhance employment and financial security
- Enable aging-in-place (with a barrier-free environment and essential services in the community)
- Provide holistic and affordable healthcare and eldercare
- Promote active aging (to maintain physical and mental wellbeing and continue contributing to society)

**LOCAL BUILDING TECHNIQUES**

**FUNCTION**

**COMMUNITY IMPACT**

**SNAKE LOCAL BUILDING TECHNIQUES FUNCTION COMMUNITY IMPACT**

**SNAKE LOCAL BUILDING TECHNIQUES FUNCTION COMMUNITY IMPACT**
The center’s circular structures are modeled after the historic King’s Palace in southern Rwanda, whose woven-reed dwellings were part of an indigenous tradition that the region had all but lost. Our design draws on the delicacy of this vernacular Rwandan construction method, with rounded, perforated brick walls that allow for passive cooling and solar shading, while maintaining a sense of privacy. Bricks were made on site by the center’s future users; in crafting the 450,000 clay bricks needed for construction – using materials found on site and a new, more durable manual press method we adapted from local building techniques – women are learning marketable, income-generating skills.

The design revives a lost Rwandan design tradition with deep spatial and social layers. Its circular forms radiate outward, from intimate classrooms at the center of the site to a community space, farmer's market, and the civic realm beyond. This design is a demonstration of how local building traditions, materials, and techniques can be adapted to create new forms of housing, while maintaining a sense of privacy. The center is designed to be self-sufficient, with a rooftop water collection system that provides drinking water for the center and its users. The Women's Opportunity Center empowers 300 women annually to transcend a legacy of conflict.

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The use of bamboo as a way of re-valuing local traditions in a contemporary way speaks of the need to use local materials as well as preserve the riverbeds. The textured walls were made using local techniques of split bamboo form work. The project is an example of low-tech environmental construction. It is responsible with the environment in terms of the materials it uses, the water and energy it consumes, and the durability of the materials.

Composed of 10 classrooms, dining hall, indoor and outdoor recreation, semi-private arts spaces, first aid room, administration, vegetable garden, public auditorium, and a civic plaza. Provides food, education, and recreation services to 300 kids 0-5 years old, 100 pregnant mothers, and 200 newborns.

Participatory design and construction effort that started in generating pride and ownership since the beginning of the project. Design charades with local kids, teenagers, early youth workers, and leaders were the starting point of the design in terms of spaces, materials, dimensions, and relations with the city. El Guadual is slowly transforming a new city center where education, arts, and multigenerational gatherings are taking place making the care of the municipalities early youth a communal responsibility.

**EL GUADUAL CHILDREN CENTER**
Iván Dario Quiñones Sanchez | Cauca, Colombia | 19,622 sqft

**LOCAL BUILDING TECHNIQUES**

**FUNCTION**

**COMMUNITY IMPACT**
The architect and owner drew on long-term relationships with local artisans to assemble an expanded design team for the collaborative design-build process. A wooden “hull”—constructed of reclaimed whiskey-barrel oak, milled into thin strips, and suspended from the ceiling—creates a sense of intimacy in the long, tall interior of the former warehouse building. Above the hull, three existing skylights, fitted with delicate glass sculptures formed from warped Pyrex cylinders, filter natural light throughout the space.

Designed to complement the restaurant’s seasonal menu, sourced from a local network of sustainable farms and gardens, the interior palette balances warm textures with the use of durable, sustainable materials. Two bars, made of board-formed concrete and old barn beams, anchor the space. Inch-thick ribbons of ductal concrete form the high-backed banquettes. The chairs are constructed of cabernet-stained oak barrels from a Napa Valley vineyard. The dining room connects to an outdoor courtyard and organic garden, where homegrown herbs are harvested from raised beds that adjoin the dining tables.

Because the neighborhood is primarily an industrial district with few public amenities, the architects worked with the city to reduce the size of the parking area in front of the building to provide space for the courtyard seating area. Now the area is enlivened by restaurant patrons and is part of the public realm.

**Local Building Techniques**

- Wooden “hull” constructed of reclaimed whiskey-barrel oak, milled into thin strips, and suspended from the ceiling.
- Three existing skylights, fitted with delicate glass sculptures formed from warped Pyrex cylinders.
- Inch-thick ribbons of ductal concrete form the high-backed banquettes.
- Chairs constructed of cabernet-stained oak barrels from a Napa Valley vineyard.

**Function**

- Designed to complement the restaurant’s seasonal menu, sourced from a local network of sustainable farms and gardens.
- Warm textures balanced with the use of durable, sustainable materials.

**Community Impact**

- Reduced parking area to provide space for the courtyard seating area.
- Enlivened by restaurant patrons and part of the public realm.

**Community Plots**

- In-ground beds
- Community Supported Ag
- Hydroponics
- Greenhouse

**Programmatic Features**

- In-ground beds
- Hydroporps
- Rooftop
- Portable Planters
- Charity / Food Pantry
- Community Supported Ag

**Physical Features**

- Vertical Planting
- Charitable / Food Pantry
- Roof top
- Portable Planters

**Precendent Analysis**

- Fig 1.4.5

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**BAR AGRICOLE**

Aidlin Darling Design | San Francisco, California | 1,400 sqft

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**LOCAL BUILDING TECHNIQUES**

- Wooden “hull” — constructed of reclaimed whiskey-barrel oak, milled into thin strips, and suspended from the ceiling.
- Three existing skylights, fitted with delicate glass sculptures formed from warped Pyrex cylinders, filter natural light throughout the space.

**COMMUNITY IMPACT**

- Reduced parking area in front of the building to provide space for the courtyard seating area.
- Enlivened by restaurant patrons and part of the public realm.
The house has a rainwater collection on the roof; the water is used to irrigate the plants and also feeds into the household plumbing. The rooftop reservoir helps to keep the house (which seems to be designed for a California winter) cool. The house is also made of three floors, which means it takes up less space as populations continue to explode in the coming decades. The roof of the house also contains some green energy elements: vertical wind turbines to generate electricity from air currents, and photovoltaic awning to soak up sun energy and provide shade. The middle sections of the house are built with adjustable doors, in open and closed cross-ventilation on warm days.

In this format, the house reaches about 1,350 square feet of living space. It’s neatly portioned into sleeping, working, and socializing floors, and is designed to fit about four people (so long as those people like each other and don’t require much privacy). The walls are all adjustable, so the space can be fitted to meet the needs of the inhabitants. It also contains a shared bathroom and closet. The most obvious “green” quality of the house design is the greenery lining the outside of the house. The siding grows a variety of edible greenery, just waiting to be picked. This somewhat fantastical design seems to be as much about the future of food production as architecture. The façade of the three-story abode is slathered in a vertical garden that includes chickpeas, tomatoes, arugula and green tea. Step outside in the morning and harvest your meals.

The house is also made of three floors, which means it takes up less space as populations continue to explode in the coming decades. The Incredible Edible House’s compact 30’x45’ footprint (requiring a five-foot setback) is ideal for dense urban landscapes, and its vertical format amplifies its already inherent energy-saving tendencies. This prototype serves as example for the communities to visualize the feasibility of urban agriculture, and the techniques that can be implemented to grow a greener environment, from your own home.
### PRINCIPLES FOR URBAN AGRICULTURE

1. Promote biodiversity.
2. Increase food security and food safety.
3. Incorporate education and outreach for awareness.
4. Be climate adaptive for environmental resilience.
5. Maximize water accessibility, availability, and quality, and address the value of one drop.
6. Maximize waste and energy effectiveness.
7. Provide for soil resiliency and soil health.
8. Develop a systems network that is both regionally and locally appropriate.
9. Promote social responsibility.
10. Protect and increase human health benefits.
11. Provide for the connection of people with nature to the enrichment of both.
12. Foster community, placemaking, and social resilience.
13. Develop dynamic connectivity between the human and ecological systems.
14. Promote sustainable economic benefits and opportunities.
15. Increase the treatment of waste as resource for a zero-waste outcome.

### URBAN MORPHOLOGIES APPLIED TO PRECEDENT STUDIES

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<td>INSIDE MEETS OUTSIDE</td>
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#### SYNTHESIS MATRIX

<table>
<thead>
<tr>
<th>PHYSICAL FEATURES</th>
<th>PROGRAMMATIC FEATURES</th>
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<tbody>
<tr>
<td>INSTITUTIONAL PUBLIC SPACE</td>
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<td>EDUCATIONAL INSTITUTIONAL RESIDENTIAL</td>
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<td>COMMERCIAL</td>
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<td>SERVICE</td>
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<td>INSTITUTIONAL</td>
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<td>OPEN SPACE TOTALITY</td>
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<td>RECREATION</td>
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Communities with low quality of its built and social environment become the focus of my study. Sites that lack techniques for the preservation of natural resources, land, and/or are in need of socio-economic development, tend to have the most potential for improvement.
Colombia is one of the countries with the fastest economic and urbanization rates in Latin America. After almost half a century of internal armed conflict, the country has experienced a massive migration to its cities causing the population to increase almost 75 percent. Caught between confiscated land, rampant violence and drug trafficking, many rural Colombians became desperate for security and opportunities for work, as well as better health-care and education systems. People decided to leave their homes in the countryside to find a place in the city to live in.

Unfortunately, displaced people have had to experience poor living conditions and housing that only focus on physical amenities, such as brick walls and a roof. Housing is a multidimensional problem and that people need community integration to achieve dignified living conditions.

Identity is considered a subjective phenomenon that is shared when interacting with others. Personal identity is also about belonging to different socio-cultural groups that share common characteristics. Collective identity is about how a community thinks about itself. Armed conflicts, natural disasters and poverty dynamics generate ruptures in these identities affecting social relationships and the collective memory. This is what happens in Colombia where the armed conflict has affected the collective identity profoundly.

Many of the displaced families are forced to live on the outskirts of the cities, like Bogota, where housing, safety, jobs, and basic needs are very limited. This is the case of Ciudad Bolívar, a locality illegally formed by displaced families looking for better conditions.

<table>
<thead>
<tr>
<th>Bogota</th>
<th>Ciudad Bolivar</th>
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<tbody>
<tr>
<td>Population: 10,200,000</td>
<td>Population: 720,000</td>
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### 13. %
Of urban population live in slums in Colombia

### 16.1 %
Of urban population live in slums in Bogota

Fig. 2.1.1

While Ciudad Bolivar is 70% rural and 30% urban, its urban portion includes one of the world’s largest mega-slums. Its urban area concentrates the poorest population in Bogotá.
HISTORY OF THE FORMATION OF CIUDAD BOLIVAR

1940

Armed conflict in rural areas of the country [Mid-20th century to present]

1950

People start migrating to cities escaping conflict [Tolima, Boyaca, Cundinamara]

1980

Beginning of invasion of land and haciendas [to 1960]

Haciendas get formed on the outskirts of the city

Bank of Interamerican Development (BID) - provided displaced families with lots and utilities

1993

The Council of Bogota designed the Ciudad Bolivar Plan, a future development of the informal settlement

Displaced families start practicing urban agriculture at home

Haciendas get fractioned as a process of urbanization due to its proximity to the exploding Bogota's urban development

Population: 50,000

2009

Pilot plan for local tourism, based on carrying out sustainable tourism activities which also rescue the cultural identity of the rural area of Ciudad Bolivar

Start of invasion of land and haciendas [to 1960]

2011

Citizen Bolivar becomes a locality with its own local city hall and local administrative council

September 14, 1983 - The minor city hall of Ciudad Bolivar is created

2015

First school to provide urban agriculture program to students and self-sustainable projects

The association of rural community tourism is established with 66 farmers

Site selection
Within the national context, Bogotá and its area has a high urban growth rate. The dynamics of urban growth in the savannah have been characterised by a growth in housing, which has not been properly followed by a proportional increase in infrastructure, generating a pronounced unbalance between the population and educational, health and recreational services. Public services and employment for the new population are mostly provided by Bogotá.

Bogotá’s pattern of growth and concentration shows that the process of urban development has generated concentration in the central city with over 50 million inhabitants in an area of only 31,000 hectares. In 1999, Bogotá’s population was estimated at 6,322,702, with a gross density of 204 inhabitants per hectare.

Since the nineties Bogotá has presented a considerable increase in the rates of forced displacement, with negative impacts on living conditions in the city. In the study entitled “Desplazados por Violencia y Conflictos Social en Bogotá” (People Displaced by Violence and Social Conflict in Bogotá) carried out by the archdiocese of Bogotá and CODHES, a total of 122,125 refugees are found to have arrived in the city (Arquidiócesis de Bogotá 1997: 41). According to the data of the Social Solidarity Net, in the year 2000 3,403 families arrived in Bogotá, approximately 17,000 people (Red de Solidaridad Social 2001), which represents an important increase in the poverty levels of the city.

Ciudad Bolívar presents high rates of growth compared to Bogotá’s mean, turning them into one of the most densely populated neighbourhoods in the city.

Fig. 2.1.2
2.2 DOCUMENTATION OF EXISTING CONDITIONS

SLUM IN CONTEXT TO THE CITY

The localities of Bosa, Usme and Ciudad Bolívar have the highest concentrations of poor people in the city: 28 percent in Usme, 20 percent in Bosa and 30.7 percent in Ciudad Bolívar according to the NBI indicator. The conditions of these localidades on the urban periphery, permit the concentration of migrants and the accelerated development of spontaneous settlements.

Ciudad Bolívar is one of the most recent settlements in the district, a product of internal and external migrations, the neighbourhoods in this locality were built on lands of old “haciendas” and extended towards the hills where there was no access to public services or roads.

As a city characterized by significant informal settlements and relevant socio-economic disparities, Bogotá does not guarantee equal access to urban opportunities for all its inhabitants.
As a city characterized by significant informal settlements and relevant socio-economic disparities, Bogotá does not guarantee equal access to urban opportunities for all its inhabitants. The issues of urban everyday mobility are particularly critical in this sense. For the worst-off strata of the population, public transport is the only modal choice available for medium and long-distance trips.

Moreover, before introducing the celebrated TransmiCable, the quality of the public service was quite low in slums like Ciudad Bolívar, mainly because of the poor institutional arrangements that defined service routes and standards, as well as the bad qualities of streets and montaneous areas, making it hard for some buses to make it up on these unpaved streets.

The TransmiCable will have an extension of 3.2 kilometers, four stations and will connect the highest points of the town with El Tunal Station (transmilenio bus system). It is expected that when the operation begins, the inhabitants who move from El Tunal to El Paraíso will reduce their travel times from 45 to 13 minutes.

PEDESTRIAN AND VEHICULAR CONNECTIONS

As a city characterized by significant informal settlements and relevant socio-economic disparities, Bogotá does not guarantee equal access to urban opportunities for all its inhabitants. The issues of urban everyday mobility are particularly critical in this sense. For the worst-off strata of the population, public transport is the only modal choice available for medium and long-distance trips.

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SLUM IN CONTEXT TO THE COMMUNITY

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SLUM IN CONTEXT TO THE COMMUNITY

“I wondered how we, the displaced farmers, were going to survive in a concrete jungle”

Marlene and Rogerio arrived in Bogotá 13 years ago. Both are indigenous leaders, protectors of the land and great connoisseurs of artisanal exploitation techniques for self-consumption and small and medium trade. Both are threatened and forcibly displaced from their places of origin by the different armed groups that battle control for the possession of the mountain forests. However, they have found a way of life for the maintenance and the management of their ancestral culture in the capital of Colombia: urban agriculture.

Thus, in that locality that many associate with crime, poverty and drugs, children are being formed to end the stigmas that have characterized their territory. “We want to show people that here we do beautiful things, that we have illusions and a lot to teach.”

Juan Forero

The inhabitants of these neighborhoods live in conditions of great poverty. The activities of the “Sembrando Confianza” project encourage the community to work together. Only in Bogotá there are 10,000 families that practice urban agriculture for their own consumption and subsistence. More than 20,000 tons of farm produce in Colombia are lost because they are not distributed properly, causing a food deficit that impacts on nutrition and generates large economic losses for small producers. “Sembrando Confianza” (Sowing trust) supports small producers, promotes local commerce for local consumers, and offers healthy and clean products available to everyone.

“Slums are way to create buildings in different weight load heads in 2015, having as a creation of urban agriculture gardens with all kinds of vegetable that could be planted in a house, thus providing sustenance and to achieve the families that are in the same way as them.”

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EXISTING CONDITIONS

The land in the urban area of Ciudad Bolívar is located at an average altitude of 2,400 meters above sea level in the lowest part and 3,100 meters in its highest part, classified as cold thermal floor. Taking into account the minimum temperatures of 9°C and maximum of 19°C, the weather station established an average temperature of 14°C for the locality. Must take into account that, contrary to what you would expect from an area with these geographic characteristics of cold climate, in this locality the environment is generally dry and sunny most of the year.

GEOGRAPHICAL CONDITIONS

ANNUAL TEMPERATURE (°C)

ANNUAL RAINFALL (mm)

LAND DISTRIBUTION

ECOLOGICAL CORRIDOR
REGION PROTECTED AREA
DISTRICT PROTECTED AREA
PARKS

LAND DISTRIBUTION
EXISTING CONDITIONS

EXISTING SITE CONDITIONS

NATURAL WATER FLOW ON SITE

TERRACES FOR FARMING = WATER COLLECTION/TRANSPORTATION

TERRACING SYSTEM TO ESTABLISH FARMING FRAME

RESIDUAL SPACES AND NODES ANALYSIS

TERRACING SYSTEM TO ESTABLISH FARMING FRAME

1. EXISTING SITE CONDITIONS

2. NATURAL WATER FLOW ON SITE

3. TERRACES FOR FARMING = WATER COLLECTION/TRANSPORTATION
In 2010, as many as 980 million urban households lacked decent housing, as will another 600 million between 2010 and 2030.

2.3 PHYSICAL AND SOCIO-SPATIAL PATTERNS

The physical and socio-spatial patterns of Ciudad Bolivar result from the conditions of the urban fabric of the area and how long the community has been established there. For example, the physical aspect of the built environment along paved streets is of better quality than the one along unpaved streets, as it is because people in these areas have access to better resources, and have been established in the informal settlement for longer periods of time, allowing them to better the quality of life over time.

The social patterns are also affected by how developed the built environment is. Along paved streets, there’s more life, vendors occupy the sidewalks, and stores occupy the first floor of their houses, and therefore, creating safer spaces. In the other hand, houses in areas with very low physical qualities, along unpaved streets or empty physical barriers, increase the risk for people since there aren’t too many businesses due to low accessibility and poor housing conditions, where it’s only possible to create a one-story house with just enough space for living.

Living conditions in the community are also highly affected by the proximity to public transportation. The areas of the slum closer to main roads with better access to the bus system or cable car stations, tend to be more developed than those further away from the main transportation hubs.

When you think of spaces to live, work, and play, the community undergoes changes. In areas with good quality of housing and street conditions, the quality of life is better and opportunities for work are higher. However in areas that have developed there’s less natural parks or areas where people can access nature or have space to play, since almost every square foot has been used for construction.

Areas of the slum with very poor quality of the built environment tend to provide less opportunity and access to work, and create a life environment with conditions people shouldn’t live in. However, since some areas have been untouched, there are spaces to connect with nature and the hills that are still untouched, as well as more space to play.
Ciudad Bolívar has 109,445 homes, which represent 7.9% of Bogotá’s total. By 2009, the Socioeconomic strata shows that 58.6% of homes in this locality are qualified low-low, 37.3% low, 2.7% are medium-low and 1.4% are classified none.

Slum areas are associated with a high number of substandard housing structures, often built with non-permanent materials unsuitable for housing given local conditions of climate and location. Factors contributing to a structure being considered substandard are, for example, earth floors, mud-and-wattle walls, straightened oil drums, used corrugated metal sheets, plastic and canvas sheets, cardboard cartons and discarded timber.

Parts of the slum have been gradually and partially rebuilt with more permanent material. They have better urban integration, with some services and self-improvements of tertiary road, rail and waterways and organized garbage collection. Houses in these areas are mostly built with brick and cement and are typically financially better off.
2.4 SITE POTENTIAL AND CONSTRAINTS

MICRO + MACRO SCALE CONDITIONS

SMALL SCALE: SYSTEMS USING LOCAL/WASTE MATERIALS TO CREATE VERTICAL/ROOF GARDENS.

MICRO-SCALE INTERVENTIONS

MEDIUM SCALE: MEDIUM SCALE FARMING SYSTEMS IN RESIDUAL SPACE BETWEEN HOMES.

MEDIUM SCALE INTERVENTION

LARGE SCALE: TERRACE/LARGE SCALE FARMING IN RESIDUAL SPACE BETWEEN HOMES.

LARGE SCALE INTERVENTION

NORTH TO SOUTH SECTION: The north to south connection can serve as an edge with the potential to create an agricultural corridor that brings food security, economic stability, and social integration.

EAST TO WEST SECTION: Establish an East to West connection between the two settlements. An edge that can bridge both the communities physically and socially.
Exploration and development of typologies where markets, farming gardens at various scales, and living spaces, can cohesively create a sense of place and identity.
3.1 URBAN AGRICULTURE AS CATALYST FOR DESIGN

- **Scale Conditions:**
  - Decent Work + Economic Growth
  - Clean Water + Sanitation
  - Food Security + Safety
  - Inspiration + Education
  - Access to Nature + Place
  - Access to Community Services

- **People:**
  - Individuals
  - Single/Multi Family Households
  - Children
  - Students
  - Neighbors
  - Urban Farmer/Producer

- **Scarcity Conditions:**
  - Big Scale Small Scale Garden Typologies

- **Outcomes:**
  - Reduced Inequalities
  - Good Health + Well-Being

- **Stakeholders:**
  - Students/Children
  - Neighbors
  - Inspiration + Education
  - Food Security + Safety
  - Decent Work + Economic Growth

- **Technologies:**
  - Wellness Gardens
  - Edible School Gardens
  - Farm to Table Gardens
  - Urban Farms/Community Gardens
  - Multi Family Landscapes
  - Food Pantry Gardens
  - Yardshare
Maximize agricultural revenue potential by capitalizing on through-site traffic. The location of the market next to the main paths of traffic is crucial for a successful agricultural network.

A hub that increases food security and food safety and incorporates education and outreach for awareness. A place that fosters community, placemaking, and social resilience.

Living spaces where families can practice farming techniques as well as selling their own produce at a smaller scale. People become part of a shared local community: reconnecting people with nature and consumption with production.

Reinforce the agricultural growth of the existing residual spaces by providing land where farming can happen at different scales as well as social integration for everyone.
3.3 PROGRAM AND TYPOLOGY DEVELOPMENT

LIVING-CULTIVATION-COMMERCE TYPOLOGY MATRIX

LIVING-CULTIVATION-COMMERCE + URBAN MORPHOLOGIES

SINGLE STORY HOUSING TYPOLOGY

MULTI- STORY HOUSING TYPOLOGY

LIVING COMPONENT
CULTIVATION COMPONENT
COMMERCE COMPONENT
A community where agriculture is introduced at the initial stages of the design process, with farming gardens, food markets, and a community hub that coalesce into a performative edge and mediate between the rural and urban worlds.
4.1 DESIGN APPROACH

FROM GRID TO FORM

ACTIVATE + EDUCATE

ANCHOR + COLLECT

LINK + GROW

LOWERED GARDENS

URBAN PARK + GARDENS

URBAN PLAZA

STREET MARKET
4.2 **FINAL DOCUMENTATION**

- CIRCULATION - TO SITE AND ON SITE FLOW
- FARMING TERRACES + GARDENS
- FARMING GARDENS WITHIN HOMES
- MULTI-PURPOSE PLAZAS + MARKETS
- LIVING VOLUMES
- EDUCATION + COMMUNITY HUB
LOWRED GARDENS

URBAN PARK + GARDENS

INTENSIVE AGRICULTURE:
- Terrace Gardens
- Community Gardens
- Learning Gardens

SMALL-SCALE OR MICRO FARMING
- Raised Beds
- Container Farming
- Multi-Level Gardening
- Portable Planters
- Backyard Farming

MULTI-LEVEL GARDENING
- Portable Planters

URBAN PLAZA

MULTI-PURPOSE PLAZA:
- Permeable Plaza
- Entertainment Space
- Outdoor Amphitheater
LIVING-CULTIVATION-COMMERCE GROUP TYPOLOGIES

SINGLE STORY HOUSING TYPOLOGY

SINGLE AND MULTI-STORY HOUSING TYPOLOGY

SINGLE AND MULTI-STORY HOUSING TYPOLOGY + COLONNADE

SINGLE AND MULTI-STORY HOUSING TYPOLOGY [ COLONNADE ONLY ]

TYPOLOGIES CONCEPT SECTION
FINAL MODEL | Physical Model at 1:40 scale
ACTIVATION PROCESS OF RESIDUAL SPACES OVER TIME

CULTIVATION

LIVING + CULTIVATION

LIVING + CULTIVATION + COMMERCE + COMMUNITY HUB

LIVING + CULTIVATION

CULTIVATION
What defines a character of a city is its public space, not its private space. The value of the public good affects the value of the private good. We need to show every day that public spaces are an asset to a city.
The outcome of this Thesis derived from an extensive research and exploration process, that started once after I asked myself two questions. First, how can architecture impact those communities with less resources, communities that have been socially and physically broken due to conflict or disasters. Second, how would places look like if architects included these people in the design process instead of alienating them from it? I remember growing up in Bogota, Colombia, everyday walking to school or to the store, or visiting places around the city, I would see displaced families on the streets, asking for food, money, or a job. I saw parents with their children, struggling to find a new home for away from home after being displaced. This created an interest on exploring ways architecture could help mediate those gaps between the lives they once had in rural communities to their new lives in the city.

My research of Ciudad Bolivar and its history, brought me to the conclusion that today, many families still practice agriculture and the techniques they once knew in rural communities are still present. However, due to the lack of resources, safety, and knowledge in the informal settlement, families haven’t found a way to use urban agriculture at its full potential. At some point in history, early civilizations thrived by including agriculture as a key component of their urban planning, but overtime, due to the fast-paced urban sprawl, agriculture was moved to the edges of the cities or to rural territories. However, cities are facing a shift where agriculture is being practiced within the city limits at various scales. Most importantly, agriculture is being practiced to alleviate poverty and increase food security. One thing to highlight, however, is that this is happening in developed and developing countries equally.

During the design process, there was a back-and-forth debate between an urban design proposal and a building proposal. The decision to design a concept of a performative edge that encompassed buildings and outdoor plazas and gardens, resulted from the conclusion that the character of a city is its public space, not its private space, and that the value of the public good affects consequently the value of the private good. Therefore, the focus was placed on designing a place where agriculture and people’s traditions are the catalyst for design, and where farming gardens work side by side with the built environment to achieve and improve the social realm of the community. Lastly, this thesis serves as the beginning of a movement in informal settlements, where all residual spaces can potentially become a Cultivated Edge, where people of all ages and origins, can come together as a community.
Personal identity is about belonging to different socio-cultural groups that share common characteristics. Collective identity is about how a community thinks about itself.
Barrios in the outskirts of Bogota, Colombia are studied in a two-fold reverse of the global rural-urban population distribution of households. A household is defined by the United Nations as a group of people that live in slums in the mid-twentieth century. The reverse of the global rural-urban population distribution of households is a critical issue for cities and the United Nations. The United Nations has been at the heart of most cities since ancient times. Public markets have been at the heart of most cities since ancient times. Build Local Economies Through Markets. Create Squares and Parks as Multi-Use Destinations with many attractions and functions. Public spaces are “multi-use destinations” with many attractions and functions. Public spaces are an asset to a city. "In Ciudad Bolívar most cannot go to the market."

The localities of Bosa, Usme, and Ciudad Bolivar have the highest number of migrants in the city. Indigenous leaders protect the land and are great connoisseurs of a better life. The sense of belonging that they have developed for the care of the environment is crucial for the future of the city. In that locality that many associate with over six million inhabitants in an area of only 31,000 hectares. In southern Rwanda, whose woven-reed dwellings were part of an indigenous culture, populations continue to explode in the coming decades. The roof of the house is a crucial element of the design. The project also includes a demonstration farm that helps women produce and meet the needs of the inhabitants. It also contains a shared bathroom and closet. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The roof of the house is a crucial element of the design. The project also includes a demonstration farm that helps women produce and meet the needs of the inhabitants. It also contains a shared bathroom and closet. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space. The project is aimed at providing residents with a desirable garden environment and opportunities for productive use of limited space.