Urban Agriculture, a mechanism to increase Community Resourcefulness and Develop Social Fabric

Study case, Bogotá Colombia

Bachelor Thesis

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Abstract

Urban Agriculture is an integral, multi-functional, and multi-component practice that revolves around food production, working with soil, using local resources and potential. This practice has been jeopardized in Bogota, due to the lack of recognition, available arable land, and political support. Urban farmers do not have sufficient economic and material resources, and still, they have been able to flourish in harsh conditions. This paper answers the question How can urban agriculture increase community resourcefulness in Bogotá Colombia? Using structured interviews, this research studied the practice of urban agriculture from the lenses of five consolidated projects distributed in different localities of the city. This was completed together with two institutions that are involved in urban agriculture and the remarks of a sociologist on the understanding of Bogota's social contexts. Findings suggest that urban agriculture is not simply an agroecology practice, but a social fabric is built where social, cultural, pedagogical, political and community relationships are as essential as soil to the practice. Furthermore, it allows the people to become resourceful and adds to the resolution of social, political, and environmental problems, contributes to food security, to the renovation of misused public places and support people in conditions of vulnerability.

Table of Contents

1. Introduction

1.1 Background

Food is a basic need for wellbeing, alongside water, air, and shelter. Spatial planners emphasized strongly on "shelter", by building housing and infrastructure, "water" to ensure quality and proper water management, and "air" to minimize the air pollution within cities (Fisher, 1996; Contant, 1996). However, food is something that has been excluded from the equation (Fisher, 1996; Contant, 1996). Although in urban areas there are places to access food; these are just the remnants of the food production cycle, where people just buy and consume, losing the connection to where the food comes from. Food production has become absent from the planning interest for years by being objectified and treated as something intrinsically rural (Viljoen et al, 2015).

Bogota is no different; the city has suffered from rapid urbanization, a phenomenon that has led the city to a rise in poverty, increased population density, and informal living and working conditions (Parnell & Pieterse 2014). Rapid urbanization has become a burden to the agricultural market. Pressuring the city to become more resilient and adaptive towards future food production (Magig & Drescher, 2009). According to Herman Martinez (2010) Director of the Bogota's Botanic Garden, Urban Agriculture can become the solution to the lack of food production in the city.

As stated by the USDA (2020), Urban Agriculture is a "local food system where food is produced within an urban area". This practice enables the revitalization of an area, the increase in social and economic capital, and has beneficial impacts on the landscape (Magig & Drescher 2009). Furthermore, Urban Agriculture has the capacity of developing a "Social Fabric". The social fabric is the creation of relationships and identity based on a location, within a group of people that share a similar way of living, and together construct a better quality of life (Daguer 2011). From the consolidation of this fabric, communities become "resourceful". Resourcefulness can be defined as the ability of a community to overcome and cope with difficulties by implementing their material resources to access the levers of social change (Franklin 2018). This is a process that can happen throughout the practice of urban agriculture.

This thesis aims to further discuss the topic of urban agriculture and its effects on community resourcefulness, focusing on existing projects that are taking place in the city of Bogota. The research will emphasize three main aspects: the practice of Urban Agriculture in the city; the social context surrounding the practice; and the policies that involve this agricultural activity.

1.2 Research Problem

The research problem arises from inquiring about the societal outcomes that developed throughout the participation in Urban Agriculture projects. Together with its effect not only on the spatial environment, but in the social, and political context. Herman Martinez (2010) emphasizes the rapid demographic development that Bogota has suffered in recent years, the phenomenon that led to social segregation, cultural differences, and high economic inequality. Martinez argues that throughout the implementation of urban agriculture projects, it is possible to find a common ground for the citizens to build a community.

The research aims to explore different urban agriculture projects that have been developed in the city of Bogota, together with determining the social and political outcomes that have been achieved by them. This will be done through three different perspectives: (1) from The Urban Farmer's point of view, where social, political, and local context will be discussed. (2) Two institutions that are working with urban agricultural projects in the city: The Bogota´s Botanic Garden in one hand, and the Network of Urban and Peri-urban agriculture on the other. (3) The perspective of a Sociologist in regards the context of Bogota through the lenses of urban agriculture.

1.3 Societal and Scientific Relevance

The results from this paper aim to extend the investigation into the urban agriculture field in the city of Bogota. In regard to the societal aspect, the paper captures the composition of urban agriculture projects in their local environment, including parameters that can be further replicated and applied in different projects. Furthermore, the paper seeks to capture different potentialities and problems that this practice faces, which can be used to further improve the existing urban agriculture projects and allow new ones to emerge.

In regards, scientific relevance, the paper aims to provide more information in the field of urban agriculture in the context of Bogota. Furthermore, it will take a spatial planning perspective, adding to the existing literature gap. The paper seeks to raise inquiries on different contexts regarding urban agriculture, and aspects that can be further researched in future investigations.

1.4 Research Question

How can urban agriculture increase community resourcefulness in Bogotá Colombia?

1.5 Sub questions

1. How can urban agriculture add to the social fabric?
2. Until what extent does urban agriculture contribute to community resourcefulness?
3. What is the potential and what are the problematic aspects of urban agriculture projects in Bogota?

2. Theoretical Framework

2.1 Urban Agriculture

Urban and Peri-urban Agriculture is defined by the Food and Agriculture Organization of the United Nations (FAO, 2011). As "the cultivation of plants and raising of animals in the interior and the surroundings of the cities". This practice arises as a strategy to achieve food security and food sovereignty. This is implemented through the production of a variety of vegetables, roots, fruits, grains, and fungi, as well as non-for-consumption plants, such as medicinal, aromatics, and ornamental plants (FAO, 2016).

It is a multiscale practice, oriented towards self-sufficiency and can be used as a mechanism to strengthen local economies (FAO, 2011) and Support the consolidation of relationships between suppliers and consumers in the food production system (Mougeot, 2001). Additionally, urban agriculture contributes to better land use, reduction of soil degradation, conservation of biodiversity and engages with sustainability principles (Ribeiro et al., 2015). It contributes to social cohesion and generates green spaces in the urban setting (Contesse, et al., 2018).

According to the Bogota's development plan (2015), urban and peri-urban agriculture is defined as "a model of food production which allows neighborhood communities to organize and implement agricultural systems, through practices that optimize resources, waste management and do not interfere with the ecosystems, while using a range of technologies". Furthermore, the Bogota Botanic Garden (2015) defined urban agriculture as "a practice that is carried out in the urban space, within the city and the surroundings, using the local potential and workforce, the available areas, water, solid and liquid waste." The Bogota Botanic Garden (2015) also argues that urban agriculture "generates dialogues and exchange of knowledge between the technical, scientific and traditional approaches, promoting environmental sustainability, food security, self-sufficiency, commercialization and strengthening social fabric".

2.2 Resourcefulness

By means of Urban Agriculture people become more resourceful. This concept can be understood as a process rather than an identifiable condition, as it is not something that communities possess, but something they experience (MacKinnon & Derickson, 2012). In the normative sense, it is understood as "the capacity to engage in genuinely deliberative democratic dialogue to develop alternative agendas and work in ways to challenge existing power relations" (MacKinnon & Derickson, 2012). Resourcefulness is "meant to problematize both the uneven distribution of material

resources and associated inability of disadvantaged groups and communities to access the levels of social change" (MacKinnon & Derickson, 2012).

Furthermore resourcefulness "seeks to redress issues of recognition and redistribution" (Fraser, 1996). It works towards cultivating community conditions for the development of social relations (Walker & Cooper, 2011). Resourcefulness is a scale-specific process, which entails that it focuses on the community level, local priorities and needs (Cumbers et al., 2008). This means that it can be a unique process to the community residents and activities (MacKinnon & Derickson, 2012).

In addition, resourcefulness encompasses four main elements; first "the material property", which often is linked to the problematization of the unequal distribution of resources (Swanstorm, 2008). Second "skills and set of technical knowledge" in relation to governmental procedures and financial and economic knowledge, reinforcing the take on policy issues (Fischer, 2000). Third, the "folk/indigenous knowledge" which is the knowledge generated throughout experiences, practices, and perceptions, which are place based (Escobar, 2008). And fourth "cultural recognition" which entails the importance and value of culture, justice, self-worth, and community-affirmation (Taylor, 1994).

2.3 Social Fabric

There exists a commonality between social fabric and resourcefulness. In this paper social fabric is a condition for resourcefulness to develop. Social fabric not only contains capacities but revolves around networks and contextual reasons why this term was chosen for the research. According to the organization Habitat for Humanity (2018), Social Fabric can be defined as a "group of people who come together to satisfy elementary or higher human needs". Such as health, education, food, social security, public services, transportation, and all the aspects that represents a better quality of life. The organization referred to two types of the social fabric, "the relative" which includes all the family structures, nuclear and extended family. As well as the "community" which develops from the union of different family nuclei living nearby.

The Ministry of National Education (2008) of Bogota introduces the term "citizen competencies" whilst discussing social fabric. Referring to it as a "set of knowledge, attitudes, communicative, emotional, cognitive, and integrative skills" that articulate the complexity of living in a society. With these competences' citizens are expected to "develop capacities for decision making, acquisition of criteria, teamwork, assuming responsibilities, solving conflicts, negotiation, and participation" (MEN, 2008).

Furthermore, Putnam and Leonardi (1993) discussed the difference between "links" and "bridges" while developing the subject of the social fabric. Links refer to the creation of bonds between people through socialization and commonalities (Putnam and Leonardi, 1993). On the other hand, bridges refer to the creation of ties with different people, regardless of their differences (Putnam and Leonardi, 1993). The

mentioned concepts make up the social fabric by establishing measures of collaboration between different groups of people, articulating "different degrees of trust, civic norms and behaviors" (Putnam & Leonardi,1993), by associating elements that strengthen the so-called fabric.

When talking about social fabric concerning agriculture, an association can be made to the term "network". Which consists of building relationships, bridges, dialogue, and communication. Social fabric in agroecology refers to the capacity to contribute to the conservation of land, water, nature, and resources among those involved in the network or fabric (Murcia, 2010). It also contributes to the wellbeing and health of the people participating in agricultural practices. In addition, the replication of experiences with each other adds valuable experiences that help the environmental and social development (Calvet et. al, 2014).

2.4 Conceptual Model

- Social Cohesion
- Dialogue
- Interdisciplinary, Multifunctional, Multicomponent practice
- Self-Sufficiency
- Local Potential
- Food Security & Sovereignty
- Sustainable Principle

Urban Agriculture

Social Fabric

- Social and Human Capital
- Social Development
- Citizen Competences
- Diversity and potentiality
- Networking
- Responsibility
- Conflicts Resolution
- Social Bonds
- Collaboration

- Recognition
- Change Power Relations
- Knowledge Exchange
- Redistribution of Resources
- Involvement in Policy Making
- Value of Land & Culture
- Utilization of Resources
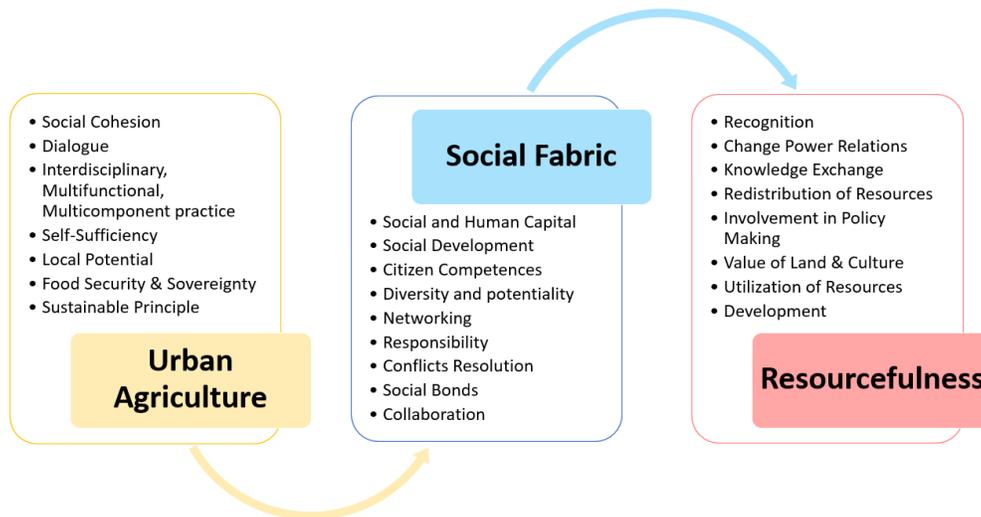- Development

Resourcefulness

Figure 1 Conceptual Model. Source: Author

According to the figure 1. The members of the urban agriculture communities share similar objectives and similar experiences, that together lead to the creation of social fabric. The social fabric then is used as a mechanism of conflict resolution and further development of social and human capital. Resourcefulness comes next as a way generate changes such as recognition of the practice, adding value to the land and a better distribution of the resources.

The conceptual model reflects the reasoning deducted from the theoretical framework. The mentioned aspects were not systematically researched but used as inspiration for the development of the interview guide. The topics described above serve as the key concepts for the consolidation of the interview questions. Furthermore, the research remained open to deductive findings that emerged from the interviews.

3. Methodology

In the development of the investigation, a qualitative empirical method was used to collect data, specifically using structured interviews. This was chosen because the case study was small and the desired data is subjective, focusing on the feelings and the interpretations of the people. The method that is used are structured interviews, as it is important to orient the participants in the right way using a strict structure in the interview.

3.1 Research Context

The research was done by phone calls, as all the participants were in Bogota, Colombia, while the author was in the Netherlands. The author was able to establish a relationship with the participants and add them to WhatsApp where most of the communication took place, as well as the international calls, that were done considering the time zone differences of 6 hours. All the interviews were done in Spanish, the native language of both the participants and the author. The quotations and the coding were translated into English for the analysis.

3.2 Urban Agriculture Projects Selection

On the urban agricultural side, five urban agriculture projects were selected from the Bogota Botanic Garden data set (Directorio de Huertas Urbanas de Bogota D.C), which included 205 orchards around the city. The data set had two divisions; the first one is based on the 20 localities of the city and the second division is based on the different products and services that each urban agriculture project offer. These products and services are divided into 8 different categories, that were developed by the Colombian Institute of Family Welfare (ICBF) in 2018, which are shown below in figure 2.
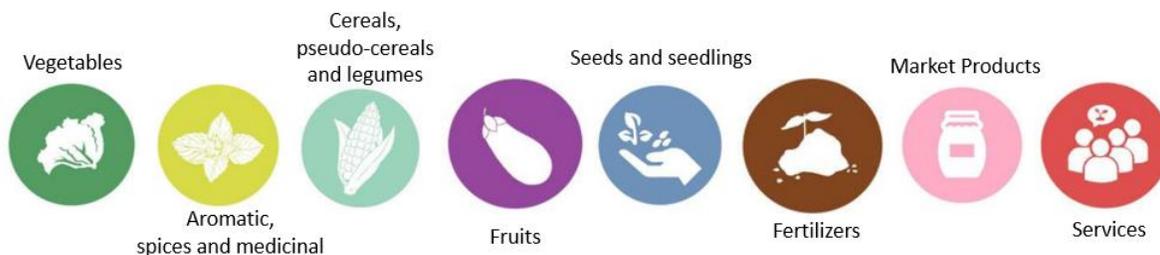
Figure 2 *Colombian food composition table of the Institute Colombian Family Welfare (ICBF 2018)*

The five projects were selected based on the following three aspects: (1) That the urban agriculture projects offered most of the 8 different products and services from the categories in figure 2. (2) That the orchards were distributed evenly around the city in different localities. (3) That the projects were located in places of the city

with similar social conditions so they could be comparable. Figure 3 shows with colors the different localities where the projects are located and with red pins the exact location of each project.
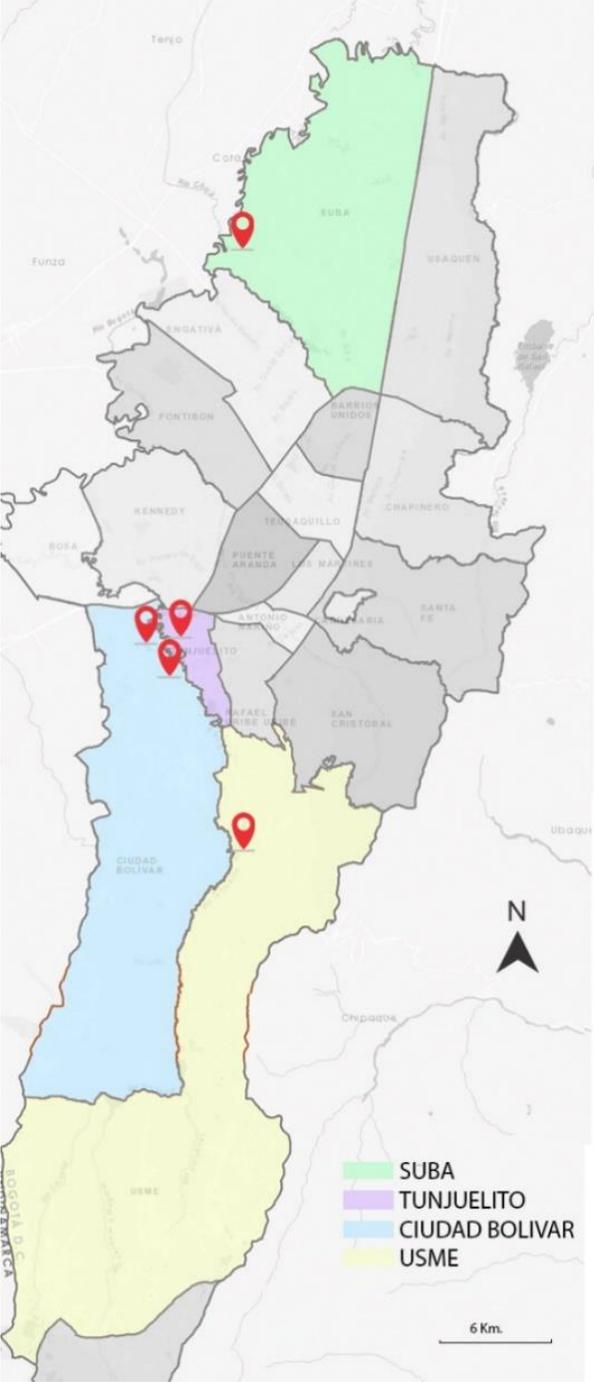

Figure 3: Map of Orchards, Bogota Divided in localities. Source: Author

3.3 Research Strategy

3.3.1 Primary Data

Eight interviews were carried out, comprising five urban farmers, two institutions, and one sociologist. The questions asked were formulated and structured previous to the interview and inspired by the theoretical framework and information from the conceptual model.

3.3.2 Institutions

The Botanic Garden is a Public Institution that was founded by the government, and it is investing in urban agriculture projects. The Botanic Garden is leading in the process of urban and peri-urban agriculture in Bogota, being in charge of providing advice, technical assistance, and training to the citizens who want to become urban farmers. The Network of Urban and Peri-urban farmers of Bogota is a formalized community-based organization with the aim of contributing to the development and construction of food security and sovereignty. This institution is playing an important role in changing the policies surrounding urban agriculture.

3.3.3 Sociologist

The sociologist knew firsthand the social context of the city of Bogotá, including necessary information for the further understanding of social fabric and resourcefulness. The interviewed sociologist is a colleague of the author, from the Florida Gulf Coast University who grew up in Bogota and based on experiences during her major understands first-hand the city context.

3.4 Secondary Data

To further understand Bogota´s social and demographical context, secondary literature was used. Cartographic information and data sets were gathered from the Bogota District Planning Secretary SDP. This is a governmental platform with interactive maps that display information regarding social, economic, environmental, and many more aspects of the Colombian Capital.

3.5 Data Collection

In total eight interviews were carried out including five urban farmers, two members of The Network of Urban and Peri-urban farmers of Bogota, and one with the sociologist. It was not possible to consolidate an interview with Ricardo Pacheco, the director of urban agriculture from the Botanic Garden, due to miscommunication and lack of time. Therefore, the information presented in the research comes from a live debate by Martha Perdomo, the director of the Bogota Botanic Garden. During this live debate she spoke about urban agriculture projects, providing key information that answered some of the inquires that the author had about urban agriculture in Bogota.

3.5.1 Table with respondent's information

The following table includes the name, role, institutions, and profession of the interviewed participants for an overview (A more complete table can be found in Appendix B).

Table 1: Overview of the respondents

Participants	Role	Institution	Profession
Maria Avendaño	Sociologist	Florida Gulf Coast University	Sociologist
Melba Castrillón	Urban Farmer	Huertas Guerreros y Guerreras	Project Leader
Wilson Andrés Quiroz	Urban Farmer	Guerra Chihizaie	Project Leader
Sandra Lancheros	Urban Farmer	Huerta Fundación Vida y Liderazgo	Environmental Engineer
Miguel Benavides	Urban Farmer	Huerta Aso Grang	Project Leader
Maximiliano Álzate Beltrán	Urban Farmer	Huerta IED es del colegio Rodrigo para Bonilla	Teacher
Carolina Hernández	Network of Urban and Peri-urban farmers of Bogota	Red de Agricultores Urbanos y Peri Urbanos de Bogotá	Specialist in education, human rights, and public policy
Carlos Núñez	Network of Urban and Peri-urban farmers of Bogota	Red de Agricultores Urbanos y Peri Urbanos de Bogotá	Specialist in public policy
Ricardo Pacheco	Bogota Botanic Garden	Director of Urban Agriculture of the Botanic Garden	Environmental Engineer
Martha Perdomo	Bogota Botanic Garden	Director of the Botanic Garden	Environmental Engineer

3.6 Data Analysis

A deductive analysis was carried out based on the responses from the interviews. Transcripts were written based on audio recordings and then manually coded. The codes were divided into three clusters: urban farmers' responses, institution responses, and sociologist responses. Based on analysis of the codes, a coding tree was made for each one of the clusters, giving insights about the responses. The coding tree reflects similarities in terms of Education, Social Fabric, Community, Public Policies, Problematics & Potentiality (Appendix A). The coding tree was based solely on the responses from the interviews; thus, the results section includes a more in-depth analysis including theory from the theoretical framework and secondary data.

3.7 Ethical Considerations

Sensitive topics were discussed in the research, such as political opinions, description of their communities, and personal opinions. Therefore, the answers obtained from the interviews must be handled with care. This was done by keeping the information provided confidential, saving the audio records and the transcript in a locked password protected computer. Prior to the interview the participants were asked to consent to be audio recorded and to use their names in the paper to indicate quotations or references in the analysis of results. They all agreed. In order to ensure

that interviewee interests were addressed, and a good relationship could be built between the author and interviewees, the author also provided information in exchange. For example, about the agricultural industry in the Netherlands, such as firms, university contacts, and organizations, for them to contact and expand their networks and generate foreign relations.

4. Results

4.1 Bogota's Demography

For a better understanding of the findings obtained from the interviews, is important to first discuss Bogota's demography, as well as the influence it has on urban agriculture. This is done using information obtained from the secondary data analysis. Bogotá has 7.191.469 inhabitants (DANE 2018) distributed in 20 localities. Four of them were subject of study in the research since they fostered the 5 urban agriculture projects used in the paper. The following table displays their population and area.

Table 2: Population size and area of chosen localities. Source: Author, Data: National Administrative Department of Statistics (DANE 2018)

Locality	Population	Area in km^2
Suba	1,348,372.00	100.56
Ciudad Bolivar	762,184.00	130
Usme	345,689.00	215
Tunjuelito	184,743.00	9.9

Figure 4 and 5 show on the one hand the population distribution throughout the city (Population Bogota 2019), and on the other the income per capita for each locality (Income per capita Bogota 2014).
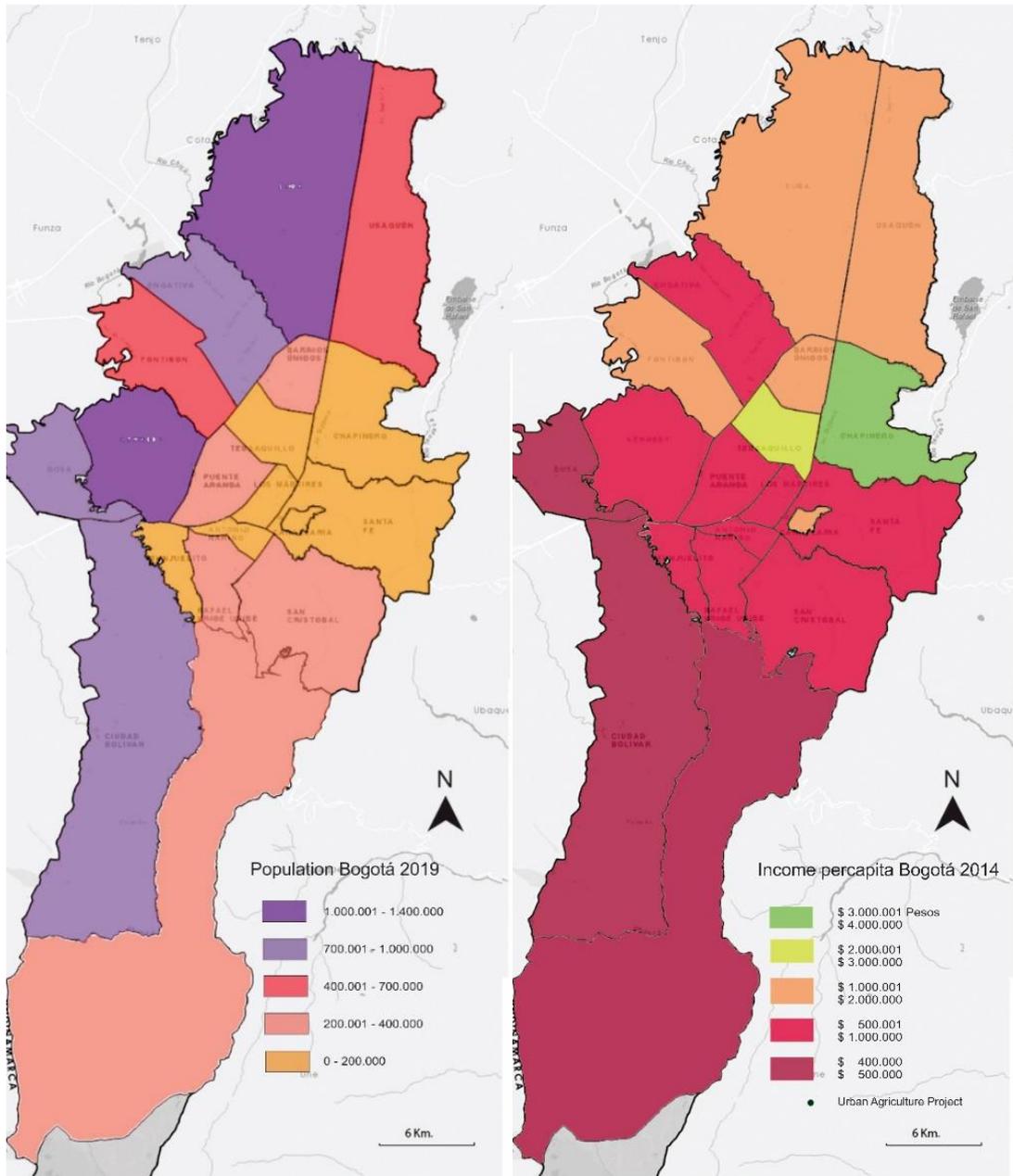
Figure 4 *Population in Bogota year **Figure 5** 2019 and Income per capita in Bogota 2014. Source: Author, Data obtained from Bogota District Planning Secretary SDP*

Based on the information displayed on the maps and the information obtained from interviewing the sociologist, two main aspects of interest can be identified. The first is the over-population that exists in many localities of the city of Bogotá, due to the historic migration of people all around the country to the capital. This is likely to have occurred due to the violence in the country and displacement of people. This creates

the assumption that there may be over-development of built area, and a lack of green spaces, which might reduce the prevalence of urban agriculture projects in the city.

The second aspect highlighted by the maps, is the difference in income per capita that exists between the north and the south of the city. For example, inhabitants of the south have an income between $115 - $287 dollars per month (400,000 - 1,000,000 Colombian pesos). However, in the North the average rises to $575 - $1150 dollars per month (2,000,000 - 4,000,000 Colombian pesos). According to the sociologist, Bogota is a city that suffers from economically based social segregation and inequality. This Phenomenon also has an effect on land ownership and accessibility to resources, hindering the consolidation of urban agriculture projects.

> *"Bogota citizen compares himself to the characteristics of the members of their social stratum, whether it is 1, the lowest, 2, 3, 4, 5 and 6 the highest. Based on these characteristics, people tend to only mobilize by their level and to integrate with people of the same socioeconomic conditions." (Sociologist-Avendaño, 2020)*

Furthermore, figure 6 displays a map with the income per Capita in Bogota, combined with the location of the 205 orchards obtained from the Botanic Garden "Directory of urban gardens in Bogota". From the information displayed in figure 6, a correlation can be drawn between low-income areas and the formation of urban agricultural projects. As shown in the map a high percentage of dots (that represent urban agricultural projects) are located in the center of the city. These areas are dominated by dark and light red, which refers to the locations with the lowest income per capita of about $115 - $287 dollars per month. It is possible that this correlation exists due to the necessities of the lower income population to access a more reliable food source and ensure food security.

Figure 7 displays a map of the rural productive areas in the city of Bogota, which are primarily located in the surrounding areas, including the 205 orchards as well. Through figure 7 it can be confirmed that the projects belong to the urban areas of the city and are not within the perimeters of rurality.
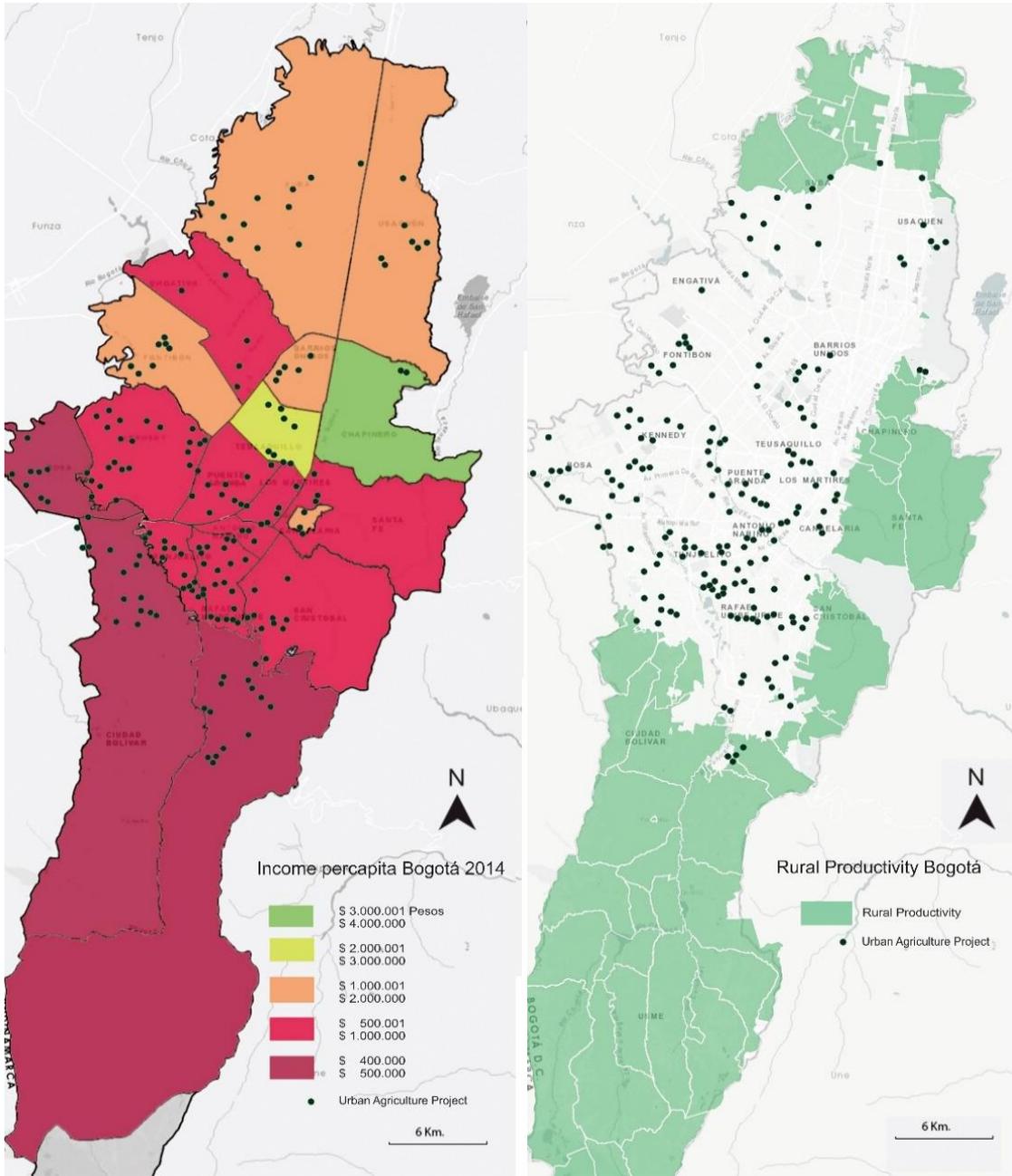
Figure 6 *Income Per Capita Bogota 2014 + Location of UA Projects* *Figure 7* *Rural Productivity areas in Bogota + UA Projects. Source: Author, Data obtained from Bogota District Planning Secretary SDP and Botanic Garden Directory of urban gardens in Bogota*

4.2 Urban Agriculture in Bogota

The urban agriculture in the city of Bogotá is not only a practice that revolves around horticulture and land use. It is a practice that integrates and seeks to build social, political, pedagogical, cultural, and communitarian relationships. This practice originates in urban spaces, taking advantage of the available land, seeking to be integrated into the built environment, such as in homes and terraces. This practice seeks to give legal recognition to urban farmers, so they can be subjects of legal rights.

The practices provide a variety of benefits to the city, such as the recovery of misused public places, increased greenery, and contributions to food security. However, the practice was not recognized or legitimized by the government until 2019.Before this recognition, urban farmers were excluded from the right to the soil, not providing them with any type of resource or funding and in many cases limiting their ability to cultivate. However, since this practice has been recognized, organization such as the Bogota´s Botanic Garden has become involved and set funds for the existing projects.

Urban Farmers have been developing different projects with sustainability values. The five projects that were analyzed in the research had developed initiatives with the purpose of educating their neighborhoods on organic waste management. This initiative hosted both virtual and physical classes for the community with the aim of teaching them how to separate and take advantage of the organic waste to produce compost for its use in the orchard.

> *"Training is given to families on how to make a vegetable garden. They began to work on composting the organic waste and later we began to plant and produce clean food" (Urban Farmer- Maximiliano Álzate, 2020)*

Furthermore, these projects have had an impact on the landscape of the neighborhoods. They have managed to recover and restore public areas that were misused and that encompassed different social problems such as crime and rubble accumulation. The project leaders, together with the help of institutions such as the botanical garden and the municipalities of each locality, have managed to recover these areas, clean them, and transform them for the use of the community and the expansion of arable land.

> *"The social impact has been great because the people who live in the neighborhood feel happy. The neighborhood was changed in a positive way, giving it an aspect of landscaping" (Urban Farmer-Miguel Benavides, 2020)*

4.3 Social Fabric

Reference is made to the social fabric in the city of Bogotá, as a way to build and weave community relationships, to develop dialogues and generate unity among those

who share the same passion. The social fabric also contributes to the well-being and health of both the people involved in the practice, as well as the soil and environment. Furthermore, it is a tool to replicate knowledge, experiences, and aid for social, environmental and citizen development.

Through teamwork, the urban farmers have been able to develop agroecological contributions, grow and conserve native plants and seeds, improve water governance, and protect many people from food shortages and poor nutrition.

"Urban agriculture began to do very well the moment we began to meet and participate in citizen meetings, one of our greatest achievements was being integrated into the government budget for urban and peri-urban and rural agriculture". (Urban Farmer-Melba Castrillón, 2020)

The social fabric in the practice of urban agriculture in Bogotá has had a significant growth since the network of urban and peri-urban farmers of the city of Bogotá was founded. Which has connected a large number of people around this practice. The network is a non-profit institution that has brought together people from all localities, and has created a place for dialogue, decision making and delegation. The network has allowed to provide free advice, technical assistance and training to people who wish to become an urban farmer.

"We are a community-based organization, focused on urban and peri-urban agroecological agriculture as a contribution to the development of the construction of food security and sovereignty. Furthermore, we are in the framework of the district development plan and we have specific guidelines for the development of urban agriculture". (Member of the UA Network -Carlos Núñez, 2020)

In regard to the five urban agriculture projects, two major target groups were discussed. The "relative", referring to the family nucleus, were activities targeting families were created. Topics such as the five R´s, waste separation, and horticultural principles were taught. This allowed the whole family to come together, learn, and share a similar passion. On the other hand, the "community" was targeted. This allowed urban agriculture projects to engage with their neighborhood by teaching and sharing agroecological and sustainable principles. This sharing had the objective of educating and challenging their local community to become more aware of both their project and the environment. This was done through pedagogic activities such as conferences and workshops, as well as the creation of markets.

Furthermore, the five urban agriculture projects had something in common: the development of "citizen competences". The group leaders described their peers as people that became more integral, more skilled, and good at decision making. In addition, they were more capable of solving conflicts, negotiation, and participation, as

well as being able to assume responsibilities and become more present and active in political decisions.

4.4 Resourcefulness

Urban agriculture in Bogotá has become a very resourceful practice. Urban farmers have adapted to the use of new technologies different from those of traditional agriculture. For example, vermiculture, the use of organic waste, and the creation of homemade fertilizers to make the most of the reduced space they have in the city. Additionally, they have been reintroducing ancestral traditions, by "bringing back the rainbow to the earth" which represents the process of increasing the diversity and variety of native species in what they grow.

The lack of recognition of urban agriculture as a legitimate practice has been one of the biggest problems that urban farmers have had in the city of Bogotá. As the practice was not recognized until recent, the government did not provide the necessary help that many projects required for the consolidation. Therefore, urban farmers tend to privatize their projects as individuals, which creates greater challenges. The acquisition of territories to cultivate requires either the purchase of the land, which most of the time is not an option, or the takeover of a misused public space, for renovation and addressing of social problems such as criminality. However there have been cases, in which the urban agriculture project rehabilitates a public area, and despite the fact that the land has been reformed, the government takes over, and seizes the property, sabotaging the advances that have been made by the urban farmers. This creates a polemic because the government does not intervene in the area when it is being degraded, however, when the projects invest and restore it, the government takes it away from them.

> *"We recover and avoid violence and crime in these spaces, through the development of urban agriculture projects. Facing the problem that according to the legislation, these spaces are not allowed to be occupied for those purposes" (Urban Farmer-Sandra Lancheros, 2020)*

However, this has been changing, and the farmers have been able to "engage in genuinely deliberated democratic dialogue to develop agendas and working in ways to challenge power relations" (MacKinnon & Derickson, 2012). This action has allowed urban agriculture to overcome the lack of legal recognition from the government. being recognized as a legitimate practice and being integrated in the new development plan for the city.

> *"The new policy recognizes us as urban farmers, however. It was and still is a challenge to gain respect of the community and the local authorities." (Urban Farmer-Sandra Lancheros, 2020)*

In addition, as farmers became more resourceful, they are able to overcome four major challenges. In regard to the "unequal distribution of resources" (unequal access to land, income, and education) the practice of urban agriculture has been able to acquire land to further expand their projects. Providing access to education and traineeships as well as providing the farmers with a small source of income. Moreover, the "skills and technical knowledge" and the "folk knowledge" have been further improved by the inclusion of ancestral traditions their agricultural practices. Most of the farmers have agriculture roots, which present an advantage in terms of diversifying the techniques and skills. This allows the farmers to be more resourceful and strengthen their relationship with the practice. Lastly the "cultural recognition" is something that is being worked on, by reinforcing the importance of culture, justice, and their values and norms.

4.5 Potential and Problematics of Urban Agriculture.

Based on the deductive findings, different problematics as well as potentials were found. At the public policy level, there is still a lack of will for the effective implementation of policies in favor of urban agriculture. The Network of Urban and Peri-urban farmers of Bogota mentioned that depending on the government administration, there could be either support to the practice or discouragement, due to differences in interests. A reference was made to the previous mayor discouraging the practice. Actions such as government manipulation of processes and monetization were some of the reasons for the government not supporting urban agriculture.

Despite the political challenges, in recent years there has been a bottom-up movement, comprised of a network of urban farmers, that has pressured the government and as a result, the practice of urban agriculture has been integrated into "Bogota's new development plan" conducted by the new administration. This alliance has also allowed urban agriculture to receive funding from the government with the provision of advice, training, and supplies, provided by Bogota's Botanic Garden. This is conducted in parallel to an initiative to maximize the number of orchards around the city.

Despite these advances, there is still a political problem, which is that the practice of urban agriculture is in the hands of eight government entities, which presumably do not have good communication with each other, which has slowed the progress of the practice.

"The district secretary for the environment, the Botanical Garden of Bogotá, the Government Secretariat, the ICFE, the Development Secretariat, the Planning Secretariat, the Health Secretariat, and the Monkfish, which is the special administrative region and the Secretary of Planning" (Member of the UA Network - Carlos Nuñez, 2020)

There are also many social problems surrounding the urban agriculture projects. Based on the Income per capita map, in figure 5, the localities where the projects are located are indicated as having the lowest income compared to the rest of the city, with about $ 115 - $ 287 dollars per month. Therefore, the inhabitants have low economic resources and higher needs regarding access to quality food. Likewise, these localities present a higher percentage of violence and social segregation.

When discussing the composition of the participants in urban agriculture projects, the idea of inclusiveness is highlighted. The projects do not make a distinction regarding skin color, sexual orientation, or age. However, the term vulnerability was mentioned. Many of the people that joined these projects lived in precarious conditions, for example, people with economic problems, (single) mothers who are heads of households, people without work, people with physical disabilities, homeless people, individuals displaced by violence, etc. There is a social purpose behind each of these projects; it is not simply providing food to people, it is about teaching them, providing a safe space, being supportive, and becoming productive members of the society by producing and sharing with each other and ensuring food safety.

> *"It is important because it helps people at the personal level, it helps reducing their stress, and in some violent communities it reduces the levels of violence. It has become a collaborative work in a home" (Urban Farmer-Sandra Lancheros, 2020)*

5. Conclusion and Discussion

5.1.1 Discussion

The research inquired about the societal outcomes that developed throughout the participation in urban agriculture projects in Bogota. It focuses on understanding the effects of this practice on the spatial environment and in the social and political context. The findings suggest that urban agriculture is having a positive impact on the surroundings of each specific project as well as on the lives of the people involved. Problematics such as vulnerability, delinquency, bad nutrition, low income, and unemployment are being supported by this practice as an attempt to mitigate them. Furthermore, it was found that social fabric acts as a mechanism of community consolidation, empowerment, and decision making. Actions that have allowed urban agriculture to gain political and local support. Despite this, the practice still faces challenges, such as political uncertainties, the lack of sufficient funding, the lack of respect from other members of society, and the difficult access to land. Overall, urban agriculture projects are mechanisms by which people seek to solve problems of a local nature, through collective work and awareness. Thus, demonstrating its effectiveness and its importance in the respective communities.

5.1.2 Conclusion

In order to conclude the research paper, the sub questions and the main research question must be answered. Starting with *How can urban agriculture add to the social fabric?* Urban agriculture is a foundation for the creation of, communities, networks, mechanisms, and social, political, pedagogical, and cultural relationships. Urban agriculture is adding to social fabric, by unifying people that without this practice would not be involved and allowing them to participate and create new social opportunities for themselves and for their neighborhoods and localities.

Following to the second sub question *Until what extend does urban agriculture contribute to community resourcefulness?* The projects have been able to develop locally- based solutions, such as new technologies different from traditional agriculture and development of initiatives and projects at small scale for households. Urban agriculture has managed to overcome difficulties imposed by the social, economic, and political conditions of the city. In addition, urban agriculture has managed to not only overcome lack of recognition and resource difficulties, but also engage in democratic dialogue and developed alternative agendas that will change existing power relations.

The third sub question inquires *What is the potential and what are the problematic aspects of urban agriculture projects in Bogota?* Urban agriculture still has a lot of challenges to face in Bogota. These mostly stem from the political and social issues; however, it is a tool with a lot of potential. It has been proven effective in fighting for inclusivity and to solve social, environmental, and nutritional problems at a local scale.

Finally, *How can urban agriculture increase community resourcefulness in Bogotá Colombia?* Urban agriculture has become the motivation and the tool for the resolution of local problematics, such as pollution, food scarcity, vulnerability, delinquency, misuse of public spaces and bad nutrition. This practice has allowed communities to solve major social issues, by implementing their resources, their knowledge, and capacities, which in turn improves their living conditions and standards. The replicability of urban agriculture projects, together with its potential of problem resolution and its ability of developing social fabric, has allowed this practice to proliferate and spread throughout the city.

5.2 Limitations

A limitation that the research faced came from the responses of some urban farmers. When being asked on their opinion about social problems and vulnerabilities regarding their communities, the responses they gave seemed avoidant and limited the discussion of negative aspects surrounding their projects. This suggests some bias on their specific responses about the topic.

Furthermore, as a researcher from a Dutch university, the relationship that the author had with the urban farmers was seen as more "transactional". For example, in exchange for the Urban Farmers providing their knowledge and experiences, the author provided networking opportunities for them in the Netherlands (international relations). As mentioned earlier, this also suggests that discussing problematics or negative aspects of their projects might reduce their chance of finding investors, which limited their answers on the topic.

Due to the COVID-19 pandemic, and the distance between the Netherlands and Colombia, it was not possible to physically be on the scene and experience the urban agriculture projects in person. Therefore, this was a great limitation for a deeper understanding of the projects and the existing social conditions, through first-hand observation.

Finally, there is a lack of information regarding urban agriculture policies. Therefore, all the information obtained was via the urban farmers and the institutions, however, clear laws and restrictions for this practice were not found.

5.3 Recommendations

Urban agriculture is being controlled by eight different governmental entities. The recommendation is for the government to create a new entity to be in charge of urban agriculture in the city. An alternative could be to give greater control of this practice to only one of the eight entities, such as the Botanic Garden.

The government could develop new urban agriculture policies, that enable the practice to be more productive and access more benefits. The policies could contain different domains, such as the use of land, the use and supply of water, increase the access to education, and stimulation of institutional involvement (universities), etc.

The existing urban agriculture projects could become more active in the use of social media and promoting their projects. This could be used to attract the interest of more people to their projects.

To monetize the urban agriculture projects is recommended to avoid intermediaries, and for the producers to be the direct sellers of their products.

It is recommended for the network of urban and peri-urban farmers to establish different programs for the resolution of specific problems, such as vulnerability in the community, improvement in nutrition, trading strategies, marketing.

It is important to teach the rest of the citizens about the traditions and endemic species from the Andes Mountains. This can help to increase the diversity and consumption of food that has been forgotten and replaced by the conventional vegetables found in the supermarket. It is important to bring back those traditions to the table.

5.4 Suggestions for future research

The research was carried out considering the socio-economic similarities between the projects, to facilitate the comparison and for the existing relationships to be more noticeable. One recommendation is that, to strengthen Urban Agriculture research in Bogotá, the number of projects to be researched should be increased, and different socio-economic characteristics can be studied, in other to understand how the practice varies depending on the context.

On the other hand, it is important to continue investigating the correlation between income per capita and the development of urban agriculture projects as mentioned in figure 6. This will deepen the understanding of urban agriculture in the city of Bogotá and how economic contexts can slow down or promote projects.

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7. Appendix

Appendix A Coding Tree

Urban Farmers

- Education
  - Workshops
  - Forums
  - Encounters
- Helath
  - Physical Health
  - Mental Health
- Social fabric
  - Exchanges of Knowledge
  - Relationships
  - Participation
- Community
  - Micro
  - Meso
  - Macro
- Public Policies
  - Recognition
  - Tools
  - Respect
- Problematics
  - Social
  - Political
  - Environemntal
  - Vulnerability
- Projects
  - Governmental
  - Particular
- Environment
  - Waste
  - General

Institutions / **Sociologist**

- Education
  - Strengthen capacities and skills
  - Replication and resonance
  - Land Use
- Social Fabric
  - Build relationships
  - Dialogues
  - Build Community
- Community
  - Support net
  - Diversity
  - Tolerance
- Public Policies
  - Development plan for Bogotá
  - Agroecological routes
- Problematic
  - Social
  - Political
  - Environemntal
  - Social segregation
  - Social inequality
- Potentiality
  - Food Autonomy
  - Nutritional Security
  - Cultural and Social heritage

- Bogota´s Botanic Garden
- Urban Farmers Network of Bogota

Appendix B Interview Table

Participants	Role	Institution	Contacting Method	When will they be contact	When will they be interviewed	Means of Interview
Maria Andrea Avendaño	Sociologist	Florida Gulf Coast University	WhatsApp	October 14, 2020	October 27, 2020	WhatsApp Call
Melba Castrillón	Urban Farmer	Huertas Guerreros y Guerreras	Telephone	October 22, 2020	October 22, 2020	WhatsApp Call
Wilson Andrés Quiroz	Urban Farmer	Guerra Chihizaie	Telephone	October 22, 2020	October 22, 2020	WhatsApp Call
Sandra Lancheros	Urban Farmer	Huerta Fundación Vida y Liderazgo	Telephone & Email	October 22, 2020	October 22, 2020	WhatsApp Call
Miguel Benavides	Urban Farmer	Huerta Aso Grang	Telephone	November 3, 2020	November 4, 2020	WhatsApp Call
Maximiliano Álzate Beltrán	Urban Farmer	Huerta IED es del colegio Rodrigo para Bonilla	Telephone	November 3, 2020	November 5, 2020	WhatsApp Call
Carolina Hernández	Network of Urban and Peri-urban farmers of Bogota	Red de Agricultores Urbanos y Peri Urbanos de Bogotá	WhatsApp	November 2, 2020	November 9, 2020	WhatsApp Call
Carlos Núñez	Network of Urban and Peri-urban farmers of Bogota	Red de Agricultores Urbanos y Peri Urbanos de Bogotá	WhatsApp	November 2, 2020	November 9, 2020	WhatsApp Call
Ricardo Pacheco	Bogota Botanic Garden	Director of Urban Agriculture of the Botanic Garden	Telephone & Email	October 27, 2020	November 14, 2020	WhatsApp Call

Appendix C Interviews

Appendix C.1 Urban Farmers

Translation to English from Spanish (Original Language)

Verbal Consent: *Thank you very much for participating in my research, before starting I would like to ask your consent to record the audio of the interview to use it in my analysis. I also wanted to know if you agree that I use your name to be able to reference you in the thesis.*

I am developing an investigation about how urban agriculture has an effect on social participation in the city of Bogotá. That is, in what way urban agriculture has the capacity to strengthen or create communities in the city. In this interview I want to understand in greater depth what it means to participate in an urban garden and how these projects have an impact on the community.

If you have any questions or concerns, do not hesitate to ask me.

The first part of the interview is to find out more about you and the project

1. What was the reason that you became an urban farmer?

2. What is your urban agriculture project about?

3. What impact has becoming an urban farmer had on your life?

The second part of the interview is based on the participation of the community in your garden.

1. Describe your community

a. What is the social context of your community?

b. What is the neighborhood where your garden is located like?

c. Is there vulnerability, crime or some relevant social fact in your community?

2. What impact has your project had on your community and on your neighborhood?

3. How do you attract more people to participate in your garden? What mechanisms do you use?

4. Do you think there are negative aspects of urban agriculture?

5. Do you think your project generates a social impact?

The third part will focus on her reflections on urban agriculture in Bogotá.

1. What are the existing challenges facing urban agriculture in Bogotá?

2. Does the mayor's office support or discourage this activity?

3. What suggestions do you have for this practice to be more publicized and implemented in the city?

Appendix C.2 Urban Farmer Orchard School Rodrigo Lara Bonilla

(This interview had some changes respect to the others, because it had a focus towards education)

Translation to English from Spanish (Original Language)

Verbal Consent: *Thank you very much for participating in my research, before starting I would like to ask your consent to record the audio of the interview to use it in my analysis. I also wanted to know if you agree that I use your name to be able to reference you in the thesis.*

I am developing an investigation about how urban agriculture has an effect on social participation in the city of Bogotá. That is, in what way urban agriculture has the capacity to strengthen or create communities in the city. In this interview I want to understand in greater depth what it means to participate in an urban garden and how these projects have an impact on the community.

If you have any questions or concerns, do not hesitate to ask me.

The first part of the interview is to find out more about your project

1. What was the reason why the school decided to implement a garden?

2. What impacts has the implementation of this garden generated for the students and the neighborhood?

3. What values do you want students to take home from this experience?

The second part of the interview is about the values of education in urban agriculture projects and knowing a little more about the contexts in which it is found.

1. What is the importance of educating students about horticulture and agricultural processes?

2. What are the social impacts, if any, of bringing this knowledge back?

3. What is the social context of your community? And the neighborhood where they are located?

3. What effects can the inclusion of traditions have on urban agriculture and the re-use of ancestral knowledge?

5. Do you think that connecting people with these types of practices can increase their sense of belonging in the city?

6. Do you think that being contextualized with the food system can reinforce the

culture, diversity and other social aspects that generally improve the community?

7. What social impact is your project generating for the town?

The third part will focus on your reflections on urban agriculture in Bogotá.

1. What are the existing challenges facing urban agriculture in Bogotá?

2. Does the mayor's office support or discourage this activity?

3. What suggestions do you have for this practice to be more publicized and implemented in the city?

Appendix C.3 Sociologist

Translation to English from Spanish (Original Language)

Verbal Consent: *Thank you very much for participating in my research, before starting I would like to ask your consent to record the audio of the interview to use it in my analysis. I also wanted to know if you agree for me to use your name as reference in the paper.*

I am developing an investigation about how urban agriculture has an effect on social participation in the city of Bogotá. That is, in what way urban agriculture has the capacity to strengthen or create communities in the city. In this interview I want to determine how social factors can have an impact on urban agriculture, or vice versa, in which way urban agriculture can have an impact on society.

<u>The first section of the interview is about understanding what "a community" is and the social contexts of the city of Bogotá.</u>

1. What is a community? And what is it made of?

2. How would you describe the Bogota society?

to. Is there inequality in Bogotá?

b. Is there social segregation in the city?

c. Do you think these factors can have an impact on the consolidation of a community?

3. Entering more into the area of urban agriculture What section of society is more likely to be an urban farmer and why?

4. What social problems can the implementation of urban agriculture alleviate? (in terms of crime, food shortages, social segregation, lack of sense of belonging)

5. In your opinion, who are the most influential actors, capable of increasing participation in urban agricultural projects / practices?

6. What are the needs of Bogotá society today? And how could an urban agriculture project supply them?

<u>The second section of the interview is about understanding your point of view on urban agriculture</u>

1. What is your opinion about the following ideas?

- Does social inequality make members of the lower classes more likely to become urban farmers?

- Social segregation represents an obstacle to the formation of urban farming communities.

- Community gardens are a tool to unite the community, beyond providing inputs.

- orchards act as an engine of social transformation

2. What do you think is the importance of the community for urban farmers?

3. What is your general opinion about urban agriculture?

Appendix C.4 Network of Urban and Peri-urban farmers of Bogota

Translation to English from Spanish (Original Language)

Verbal Consent: *Thank you very much for participating in my research, before starting I would like to ask your consent to record the audio of the interview to use it in my analysis. I also wanted to know if you agree that I use your name to be able to reference you in the thesis.*

I am developing an investigation about how urban agriculture has an effect on social participation in the city of Bogotá. That is, in what way urban agriculture has the capacity to strengthen or create communities in the city. In this interview I want to determine how the network of urban farmers has influenced this practice in the city of Bogotá and what it consists of.

The first part of the interview is about learning more about the urban and peri-urban farmers network of the city of Bogotá.

1. What is the urban and peri-urban agriculture network? And what is the purpose of this network?

2. Where did this project come from?

a. Is it supported in any way by an institution?

b. What government aid do they have?

3. Carolina mentioned to me that in the network they do a social management work working on the basis of 3 lines that are:

to. Social impact on public policies and the regulatory framework

b. Organizational Work

c. Training and modernization of urban farmers

Could you explain more fully what these bases consist of.

The second part of the interview is about the social composition of the members of the network

1. What types of urban farmers participate in the network? (Owners of orchards and projects already consolidated, or anyone can be part)

to. Do you focus on any specific type of urban agriculture?

2. How is the community on the network today and what is the social context of its members? (People in vulnerability, farmers, students, community leaders, etc.)

3. Do you think that the social segregation and inequalities that exist in Bogotá influence urban agriculture projects in any way? (in terms of encouraging or demotivating)

to. I ask this question because I have noticed by looking at the directory of urban gardens in Bogotá, from the botanical garden website, that most urban gardens are located in the center and south of the city. That it is a place that is characterized by the low resources of its inhabitants. So it leads me to ask if there is any correlation between these factors.

4. Do you think that having low resources increases participation in urban agriculture projects? Or simply this occurs organically and the social contexts do not affect the Bogota context.

The third part is about understanding at a general level the effects of the urban agriculture network in the city of Bogotá

1. What results has the network generated in the city of Bogotá?

to. Have they been more institutional or physical goals?

2. Regarding the District Development Plan of Bogotá, what changes would you like to generate in the city of Bogotá in favor of urban agriculture?

3. What are the biggest current challenges that both the network and urban agriculture have in the city of Bogotá?

4. How are the towns that participate in the network divided? Neighborhoods, sectors, etc.

to. Does any neighborhood have a greater participation?

<u>The fourth part of the interview seeks to answer general questions of urban agriculture and also of the network.</u>

1. In the phone call we had, Carlos mentioned that there is a problem regarding political interests, which is holding back urban agriculture a lot. You can go deeper into this. I want to know how political interests are affecting them.

2. Could you define the following terms for me

a. Social fabric

3. How can technical education be an important factor in the area of urban agriculture? What do you look for when training farmers?

4. What impact does commercializing the cultivated products have on the communities and on the practice of urban agriculture?

5. In the interviews I did, there is a lot of talk about rescuing public areas that are being misused both as garbage dumps and for criminality. Do you have any plans or opinions about how to transform these public areas into agricultural production environments?

6. What is the purpose of having a space for discussion and participation among farmers? What personal and community benefits do these centers generate?

Appendix C.5 Botanic Garden

Translation to English from Spanish (Original Language)

Verbal Consent*: Thank you very much for participating in my research, before starting I would like to ask your consent to record the audio of the interview to use it in my analysis. I also wanted to know if you agree that I use your name to be able to reference you in the thesis.*

I am developing an investigation about how urban agriculture has an effect on social participation in the city of Bogotá. That is, in what way urban agriculture has the capacity to strengthen or create communities in the city. In this interview I want to understand in greater depth the practice of urban agriculture and what are the necessary conditions for it to take place.

If you have any questions or concerns, do not hesitate to ask me.

The botanical garden has been developing a plan to create more than 20 thousand urban gardens in the city of Bogotá. In the same way, they are developing a network of inputs to supply local gardens.

To start the interview, I would like to know more about your role in the Botanical garden project.

1. What is your role in the Urban Agriculture project of the Botanical garden?

2. Is the Botanical Garden a Public or Private institution? And does it have any governmental power?

3. I want you to tell me more about this initiative of urban agriculture of the Botanical Garden.

The second part will focus on the Botanical Garden Project to increase Urban Agriculture.

1. What impact can 20 thousand urban gardens have on the city? Are there pros and cons of this initiative?

2. What social impact can this project generate? Which members of society will benefit the most?

3. Does this project intend to generate a community? Or simply generate a network of independent gardens?

4. Why did the Botanical Garden decide to create this initiative?

The third part will focus on the social impacts of urban agriculture

1. In your experience, what are the social benefits of becoming an urban farmer?

2. How can more people be encouraged to actively join an urban farming community?

3. What do you think is the best strategy to attract new farmers?

4. Is there an additional cost to become an urban farmer? Can it be considered an investment?

The fourth part will focus on the city of Bogotá.

1. What are the existing challenges facing urban agriculture in Bogotá?

2. Are there challenges in the regulatory framework?

3. Does the mayor's office support or discourage this activity?

4. What suggestions do you have for this practice to be more publicized and implemented in the city?

Appendix D Consent form

university of groningen | faculty of spatial sciences | research ethics committee

Agreement to participate
in bachelor research project: Bachelor thesis
Title: **Community Participation & Sense of Belonging: Urban Agriculture in Bogota**

This research studies the influence that urban agriculture has over community participation and sense of belonging in Bogota Colombia. It focuses on the outcomes that urban agriculture can have in the development of social and cultural relations, and its effects on the personal level of people involved in urban agriculture projects.

- I understand the information that has been given to me by the researcher (via oral) about the purpose of the project.
- I have had the opportunity to discuss this study. I am satisfied with the answers I have been given.
- I understand that taking part in this study is voluntary and that I have the right to withdraw from the study up to three weeks after interview, and to decline to answer any individual questions in the study.
- I understand that my participation in this study is confidential. Without my prior consent, no material, which could identify me will be used in any reports generated from this study.
- I understand that this data may also be used in articles, book chapters, published and unpublished work and presentations.
- I understand that all information I provide will be kept confidentially either in a locked facility or as a password protected encrypted file on a password protected computer.

Please circle YES or NO to each of the following:

I consent to my interview being audio-recorded	YES / NO
I wish to remain anonymous for this research	YES / NO
If YES	
My first name can be used for this research	YES / NO
OR	
A pseudonym of my own choosing can be used in this research	YES / NO

 "I agree to participate in this individual interview and acknowledge receipt of a copy of this consent form and the research project information sheet."

Signature of participant:_____Date: _____

"I agree to abide by the conditions set out in the information sheet and I ensure no harm will be done to any participant during this research."

Signature of researcher:_____Date: _____

Appendix E Urban Agricultural Projects

Appendix E.1 Aso Grang Orchard

Huerta Aso Grang

Aso Grang: Is an organization that has a socio-environmental farm with organic agriculture, a program of source separation and use of organic waste by means of composting and vermiculture. It is a community conformed their majority by people that come from the rural area. Committed with the environment, environmental health, food security and food production agroecological.

Our dreams *"Transform a land that was a rubble dump, take care of the environment through agriculture."*

The Pictures Used in this Appendix were given to the Author by AsoGrang for its use in the paper.

Appendix E.2 Chihizaie Orchard

Huerta Chihizaie

Chihizaie: The objective is to create spaces such as the vegetable garden to raise awareness among the locals about one of the biggest problems in the world, which is pollution. It seeks to form ecological awareness by encouraging changes in attitude and actions that protect Mother Earth. with the implementation of good practices regarding the management of organic solid waste and good practices in the management of rainwater.

The Pictures Used in this Appendix were given to the Author by Chihizaie for its use in the paper.

Appendix E.3 Orchard from the Foundation "Live and Leadership"

Huerta Fundación Vida y Liderazgo

Orchard from the Foundation "Live and Leadership": We from the Foundation have donated food to families, we have also received food from supermarkets, and received other types of donations directed to provide to the families who have been in vulnerable situations. I think it is super important for people not just to received, but to learn how to produce, and gain knowledge for the rest of their lives... *Sandra Lancheros*

The picture was taken from the Bogota Botanic Garden Directory of urban gardens of Bogota (Photographer Pablo Varón)

Appendix E.4 Orchard warriors and warriors

Huerta Guerreros y Guerreras

Warriors and Warriors: Our motto is "*crops with love for good nutrition*," Our garden is call warriors united in action. This project has helped us to help with food security since we all cultivate, to take care of the social fabric since we are from different neighborhoods. And different sectors. We all are from different places which motivate us to create and improve our social fabric...*Melba Castrillon*

The picture was taken from the Bogota Botanic Garden Directory of urban gardens of Bogota. (Picture taken by BBJ Urban Agriculture Technical Team)

Appendix E.5 Orchard IED Rodrigo Lara Bonilla School

Huerta IED Rodrigo Lara Bonilla (MAON)

Orchard IED Rodrigo Lara Bonilla School: The orchard that we developed in the school served as a laboratory to teach people how to cultivate and how to develop projects, how to manage pests biologically without using chemicals. Our desire was to produce purely organic products, with natural fertilizers coming from the same houses and we took liquid fertilizers collecting papayas, yeast, banana, orange, guava and we made some mixtures that we worked with molasses and lactose. The project was a success and we were recognized as 1 of the food safety projects which generated several meetings and the meetings were called Flavors and Knowledge, then flavors and knowledge was to bring together people and older adults on Saturday afternoons, we met them We gave a sheet of paper and some markers and so they described to us what plants such as Yerbabuena, parsley and celery were used for, we collected that information and the flavors were that we made a community stew and we would share the food that we grow ourselves….*Maximiliano Álzate*

The picture was taken from the Bogota Botanic Garden Directory of urban gardens of Bogota. (Picture taken Maximiliano Álzate)