From Garbage to Gardens: Urban Agriculture in Mexico City

Edwina duBois

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FROM GARBAGE TO GARDENS: URBAN AGRICULTURE IN MEXICO CITY

by

EDWINA DUBOIS

BACHELOR OF ARTS

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degrees of

Master of Community and Regional Planning

Master of Latin American Studies

The University of New Mexico
Albuquerque, New Mexico

May 2015
DEDICATION

This thesis is dedicated to my supportive and hilarious husband, Joel and my two amazing daughters, Cora and Lucy.

"Urban agriculture is not just about planting and harvesting, or working the earth. Urban agriculture allows us as human beings to know ourselves.” Rodrigo Canovas Urban Farmer and Educator
I am extremely grateful to the people who have supported my academic growth during my time at the University of New Mexico. Many complex conversations triggered my personal and professional interest in a subject matter that is not only complex, but also has the potential to make a difference. This exploration into social justice and community development will forever shape my personal life and will inform my future career.

Thank you to Dr. Claudia Isaac, my thesis committee chair. Dr. Isaac made time for me and met with me to help shape and refine my research. Without her I would still be following every interesting distraction; I have her to thank for bringing my thesis into focus. She supported my writing and gave me timely feedback when I finally turned in my first draft. I am certain my document is 1,000x better because of her suggestions. I am truly grateful for her experience and passion for community development and social justice.

Thank you to Dr. David Henkel, who served on my thesis committee. His approach helped me further focus my research question and challenged me to look at my conclusions. He has been an invaluable source of information. I am forever grateful for the things I’ve learned from Dr. Henkel both in the classroom and from his service on my thesis committee.

Thank you to Dr. Melissa Binder, who also served on my thesis committee. I truly appreciate her agreeing to serve on my committee with less than 2 months left before my deadline. Dr. Binder is a generous professor who has always made time for me when I needed further help understanding complex economics topics. I am grateful for the perspective she lent to my thesis committee.

Thank you to the supervisors and technicians at the Secretaría de Desarrollo Rural y Equidad para las Comunidades, I am so grateful that I was able to tag along with the technicians and observe so many urban agriculture projects in Mexico City. Those observations were critical in forming my conclusions.

A very special thank you to Dr. Pedro Ponce C. Javana and his technicians. I am so very grateful that Dr. Ponce took time to show me several urban agriculture projects in Mexico City that were supported by the Universidad Autónoma de Chapingo. Dr. Ponce was very generous with his time, sitting down and giving me several hours of interviews. My research would have been much more difficult without his support. I am so incredibly thankful for Dr. Ponce’s experience and perspective.

Thank you to the friends and cohorts who have supported and been there for me to bounce ideas off of, especially Megan McKenna de Mejía, Lora Logan and Amy-Lou
Linzie. These women were invaluable to my thought processes and my graduate student and research experiences as a whole.

Most importantly, thank you to my husband, Joel Carter and my two young daughters, Cora and Lucy. Living with a frazzled graduate student ain’t easy, but Joel supported me without complaint. He encouraged me when I became overwhelmed and made time for me when I needed to work through complex questions. I am grateful for his point of view and for the loving and patient way he cared for our daughters, allowing me time to write. Cora and Lucy makes these issues more personal; reminding me of why they are relevant to the health and security of our children.
The main objectives of this study are to describe the food system of Mexico City; identify how the urban poor access food on an everyday basis; determine who participates in urban agriculture projects, and for what purpose; determine the nutritional, economic, physical and ecological impact urban agriculture has had on participants; and observe the impact community urban gardens have on the surrounding community (multipliers). Many governments, including Mexico City’s, are introducing institutional and other policy changes that recognize, manage and promote urban agriculture. This study looked at urban agriculture projects, mostly in marginalized communities, within the 16 boroughs of Mexico City and analyzed their impacts on the food security and community development of the participants and surrounding community. This is followed by a discussion of challenges and opportunities relating to urban agriculture development in Mexico City.
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Chapter 1

Introduction

Populations continue to concentrate in cities as new generations migrate for jobs and capital, turning cities into the driving force of national economies. Mexico City is no exception to this trend; in fact they are an example of just how extreme this rapid urbanization can be. Since the passage of NAFTA\(^1\) and the subsequent flood of cheap US grown corn into Mexico, the population flow from rural agricultural towns into the major urban centers of Mexico has increased. Some economists argue that these immigration patterns have been in effect since the 1960s and are a common pattern in the industrialization process of countries; while others argue that the liberalization of trade has intensified that process (Villarreal 2010, pg. 15). Mexico City is debatably the most populous city in the world with a growing population of over 25 million people. In 2025 the world’s urban population is expected to reach 5.5 billion, 80% of which will live in urban centers of developing countries (FAO 2010). Many of those who migrate to cities, however, find that the jobs they were promised do not exist and are forced to live at bare subsistence levels in shantytowns and informal developments on the outskirts of the city. Mexico City is divided into delegaciónes, each delegación has several neighborhoods, that are called "Colonia," "Barrio" or "unidad Habitacional" depending on their specific history and urban characteristics. Colonias have a more formal urban structure, barrios

\(^1\) North American Trade Agreement, implemented in 1994.
are old and usually maze-like and *unidades habitacionales* consist of huge multi-family buildings, much like our north american understanding of urban, government subsidized “projects”. They are different, as the residents can eventually purchase the unit at a subsidized rate, in the US, subsidized housing is available for rentals only. These residents experience daily food insecurity.

**Figure 1. Map of the Delegaciónes of Mexico City**

http://www.buenasraices.net/mapas/delegacionesdf.html
Research question

This paper seeks to answer the question of whether or not urban agriculture programs can be used as part of a multi-faceted approach to increase food security and community development capacity in marginalized neighborhoods of Mexico City. It looks at the distribution of urban agriculture in various socio-economic areas of the city, the impact of food and nutrition security, environmental aspects of urban agriculture, the reasons that people participate and the social impacts of urban agriculture.

Urban Agriculture is defined as an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and nonfood products using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area (Mougeot, 2000). According to the numbers of National Institute of Statistics and Geography (INEGI), nearly 30% of the population of Mexico City is food insecure.

While researching food systems and food access in Mexico City I was able to work with both SEDERE橫, a federal agency, Secretaría de Desarrollo Rural y Equidad Para Las Com unidades2 (Secretary of Rural Development and Equality for Communities) (SEDEREC) and the University of Chapingo3.

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2 See Appendix A for more information on SEDERE横
3 See Appendix A for more information on The University of Chapingo
SEDEREC organizes and funds many of the major urban agriculture initiatives in the city. The *Universidad Autónoma de Chapingo* provides extensive technical support and citizen training for several projects independent of SEDEREC that are funded by individual *delegaciones*. SEDEREC funds a wide variety of projects seeking to increase food security and access for marginalized communities within Mexico City. These projects utilize a variety of production methods including hydroponics, raised bed gardening, conventional rows, and greenhouses. Many projects also included animal husbandry. SEDEREC and Chapingo strongly emphasize the use of purely organic methods. I found that, in functioning projects, the food security of both the direct participants and the surrounding community members was increased.

![Figure 2. Results of 36 interviews. Self-Reported Impact on Participant’s Food Security](image)

4 See Appendix A for a working definition of “food security.”
Methodology

This research is largely ethnographic, with an analysis on the relationship between land use, government policies, community participation, etc. When looking at methods for researching urban agriculture, it is important to remember that urban agriculture is subject to change. There are a complex set of relationships between land use, city ordinances, politics, community involvement and other activities in a similar context. In addition, people who participate in urban agriculture often have competing demands on their time, especially the marginalized population observed in the context of this research project. Informed by Yin (2003), the research method used is an “empirical inquiry investigating the real-life context of a contemporary phenomenon”. In this case the contemporary phenomenon is the state of food security in Mexico City. This method informed the entire research process, from design to data analysis; it also relied on triangulation to determine the outcome of the research. In this study, the sources of data were: (1) the academic literature on food security, city planning, Mexico and economics; (2) direct observations in the field; and (3) interviews with crucial players in Mexico City, such as urban farmers, community leaders, government employees and agronomists providing support to the local communities.

The interview analysis was conducted through an online program called Dedoose (www.dedoose.com). I chose this system because it is web-based and provided a mixed methods approach with an intuitive user interface that was easy to learn. I conducted most of my analysis in the summer of 2011 after I finished my research, interpreted the
interviews conducted in Spanish and then transcribed them. I have returned to the data several times since 2011, including September of 2013 to make my charts and graphs. The qualitative data was evaluated through coding and data triangulation. In order to do this I selected codes for this study, focusing on significant issues. These key codes are: 1) Funding Source/Technical Support; 2) Gender; 3) Reason for Participating; 4) Income; 5) Food Security (Hungry before program, if yes, how often); 6) Challenge/Detriment of Projects; and 7) Outcome. I framed my research to answer these following research questions: 1) What is the demographic, and socio-economic distribution of urban agriculture in Mexico City? 2) What is the impact of urban agriculture on food security and nutritional status at the household and individual level? 3) What are the impacts of urban agriculture on the environment and vice versa? 4) What are the impacts of urban agriculture on health?

The inclusion of urban agriculture was identified as an important component of “greening the city” by the current mayor, Marcelo Ebrard. Mayor Ebrard was elected in July of 2006 and immediately began an extensive campaign to combat the difficult problem of pollution in what is arguably the world’s largest and most populated city. He instructed the 16 delegaciones (boroughs) of the city to research and propose initiatives to green their districts. The elected leaders of the delegaciones proposed initiatives that included extensive bike paths, major trash clean up, preservation of green space and urban agriculture projects. Recent action by the government of Mexico includes the approval of

---

5 Marcelo Ebrard was elected Head of the Government of The Federal District (Mayor) in July, 2006 and remains Mayor as of October, 2014.
the Law on Food Security and Nutrition by the Legislative Assembly of the Federal District of Mexico on the 17th of August 2009. This law is a milestone for the protection of the right to food. It is one of the first laws in the world implementing the right to food at the sub-national level and thus bringing the right to food protection closer to the citizens. Another very important achievement of the law is that the right to food is recognized both, as a fundamental human right and as the main objective of this law.

According to the numbers of INEGI (National Institute of Statistics and Geography), almost half a million people in Mexico City are still food insecure. By approving this new Law, Mexico City has made a huge step forward in decentralizing the protection of the right to food. The Secretaría de Desarrollo Rural y Equidad Para Las Comunidades (Secretariat of Rural Development and Equality for Communities, SEDEREQ) was tasked with organizing and funding many of the major urban agriculture initiatives in the city. Aside from the SEDEREQ projects, the Universidad Autónoma de Chapingo (the major agriculture university in Mexico) provides extensive technical support for many projects independent of SEDEREQ that are funded by individual delegaciones.
Table 1. Key Urban Agriculture Stakeholders in Mexico City

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Role</th>
<th>Challenges</th>
<th>Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEDEREC</strong></td>
<td>• Financial support</td>
<td>• Lack of community trust</td>
<td>• Improve public space</td>
</tr>
<tr>
<td></td>
<td>• Technical support</td>
<td>• Bureaucratic red tape</td>
<td>• Improve City’s image</td>
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<tr>
<td></td>
<td>• Identify space for urban agriculture within the city</td>
<td>• Mission disagreements and personality conflicts with community leaders</td>
<td>• Help alleviate poverty</td>
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<tr>
<td></td>
<td>• Promoting urban agriculture on vacant lots</td>
<td>• Ignorance of interested community members in writing grant proposals and other paperwork</td>
<td>• Keep citizens busy</td>
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<tr>
<td></td>
<td></td>
<td>• Improve public space</td>
<td>• improve attractiveness of Mexico City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promoting urban agriculture on vacant lots</td>
<td>• Promote community engagement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Identify space for urban agriculture in the delegación</td>
<td>• Improve SEDEREC’s image</td>
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<tr>
<td></td>
<td></td>
<td>• Promoting urban agriculture programs</td>
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<td></td>
<td></td>
<td>• Providing meeting space for urban farmers</td>
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<td></td>
<td></td>
<td>• Maintenance of public grounds</td>
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<td></td>
<td>• Bureaucratic red tape</td>
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<td></td>
<td>• Difficultly finding common ground with the communities/neighborhoods</td>
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<tr>
<td></td>
<td></td>
<td>• Lack of community trust</td>
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<td></td>
<td></td>
<td>• Fight for recognition/accolades</td>
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</tr>
<tr>
<td><strong>Delegación</strong></td>
<td>• Identify space for urban agriculture in the delegación</td>
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<tr>
<td><strong>Government</strong></td>
<td>• Promoting urban agriculture programs</td>
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<td></td>
<td>• Providing meeting space for urban farmers</td>
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<td>• Maintenance of public grounds</td>
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<td>• Difficultly finding common ground with the communities/neighborhoods</td>
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<td>• Lack of community trust</td>
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<td></td>
<td>• Fight for recognition/accolades</td>
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<tr>
<td><strong>Neighborhood</strong></td>
<td>• Identify space for urban agriculture in the neighborhood</td>
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<tr>
<td><strong>Organization</strong></td>
<td>• Facilitate cooperation among community members</td>
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<td></td>
<td>• Promote the community garden</td>
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<td></td>
<td>• Manage the garden</td>
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<td></td>
<td>• Measure outcomes</td>
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<td></td>
<td>• Mediating disagreements between community members</td>
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<td></td>
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<td></td>
<td></td>
<td>• Distrust in government institutions</td>
<td>• Promote community engagement and cooperation</td>
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<td></td>
<td>• Sometimes there is a lack of community cohesiveness</td>
<td>• Improve the community space</td>
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<td></td>
<td>• Lack of trust between community members</td>
<td>• Provide food</td>
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<td></td>
<td>• Greed/jealousy</td>
<td>• Lower crime through engagement and increased community presence</td>
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<td></td>
<td></td>
<td>• Differing political views</td>
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<td></td>
<td></td>
<td>• Need to be inclusive</td>
<td></td>
</tr>
<tr>
<td><strong>University</strong></td>
<td>• Providing technical support</td>
<td></td>
<td>• Promote urban agriculture</td>
</tr>
<tr>
<td></td>
<td>• Facilitating cooperation between urban farmers and community members</td>
<td></td>
<td>• Beautify the city</td>
</tr>
<tr>
<td></td>
<td>• Providing education to the community</td>
<td></td>
<td>• Promote the University</td>
</tr>
<tr>
<td></td>
<td>• Mediating disagreements between community members</td>
<td></td>
<td>• Educate the community</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of community trust (although the university has an easier time gaining trust than the government)</td>
<td>• Preserve seeds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mission disagreement with funding entities (i.e. SEDEREC or NGO)</td>
<td>• Preserve cultural heritage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Finding interested community leaders</td>
<td>• Provide food</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Keeping community motivated</td>
<td></td>
</tr>
</tbody>
</table>

8
I was granted permission by SEDERECC to accompany their technicians as they did their “rounds,” i.e. checked on existing urban agriculture projects to evaluate them for success, and to provided technical support to the growers. By chance, I was in Mexico City at the same time that a group of Cuban technicians from Instituto de Investigaciones Fundamentales en Agricultura Tropical (INIFAT) was, and I was also allowed to accompany them as they did evaluations of SEDERECC-funded urban agriculture projects. This was a rare opportunity to gather international information, and to “pick the brains” of these very experienced and well-respected agronomists who were in town to advise the Mexican government in best urban agriculture practices. Through my research with

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Role</th>
<th>Challenges</th>
<th>Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Farmer</td>
<td>• Implementation • Harvest • Maintenance • Track output</td>
<td>• Time needed to prep/plant/weed/harvest • Greed/jealousy between neighbors • Funding entities require a lot of paperwork • Limited experience and knowledge regarding urban farming • Community political disagreements and exclusion issues</td>
<td>• Improve personal/ family food security • Access to fresh food • Exercise/occupational therapy • Beautify the neighborhood • Improve neighborhood cohesiveness</td>
</tr>
<tr>
<td>NGO</td>
<td>• Financial support • Technical support • Coordinate educational programs in the community • Community organization</td>
<td>• Mission disagreements with SEDERECC and/or the University • Keeping community leaders/members motivated • Ignorance among community members regarding filling out paperwork • Difficulty tracking output effectively</td>
<td>(NGOs can have varied motives for participating in UA projects, dependent on their missions, this is just a sampling) • Improve community relationships • Improve the urban ecosystem • Preserve water • Preserve/create soil • Improve local food security</td>
</tr>
</tbody>
</table>
SEDERECC and Chapingo, I was able to identify the key stakeholders in the urban agriculture movement in Mexico City with relationships to those two entities; this information is contained in Table 2.

SEDERECC funds a wide variety of projects that utilize several production methods including hydroponics, raised bed gardening, conventional rows, and greenhouses. Many projects also included animal husbandry. Regardless of production methods, SEDERECC strongly emphasizes the use of purely organic methods. All projects are encouraged to build a sustainable infrastructure incorporating organic production and controls. The major elements of sustainability I witnessed included: compost, vermiculture, animal traction, square-foot gardening, seed production, on-site germination, companion planting, plant barriers and deterrents, bio-pesticides, bio-control traps, drip and mist irrigation systems, rain water caption, animal manure, recycled materials, and composting or dry toilets. Projects initiated with SEDERECC receive ongoing technical assessments for the life of the project. The exact criteria by which SEDERECC chose the projects to be funded was unclear to me. I requested a copy of the required paperwork by email, phone and in person, but it was not forthcoming. I asked about the process in my interviews and was told that SEDERECC was advertising funding for urban agriculture projects on television, this is how several of the garden leaders first heard about them. They were told to come into the office and fill out paperwork and write a proposal. Each of the ones I spoke with were obviously funded and they did not know of anyone personally who was denied. Once the funding came through, they had to prove that the money was being used
for the garden though regular visits from SEDERECH technicians. The University of Chapingo conducted the original technical consultations; however, a four-person team of technicians working directly for SEDERECH has replaced these consultations in 2009. To
augment technical training and support, commissions of project leaders from the first projects were sent to INIFAT, located near Havana, Cuba to receive a two-week training course. Some projects also cited receiving continuing technical support from the University of Chapingo, the Universidad Nacional de México and Círculo Verde.

I also conducted research with the support of the University of Chapingo, Dr. Pedro Ponce, the professor and agronomist in charge of various urban agriculture programs, apart from SEDEREC, and funded by individual delegaciones. The most notable projects currently underway by Chapingo are in barrancas, (ravines) in marginalized boroughs of Mexico City. The objectives of this program are both to clean out the ravines (previously full of trash), and to simultaneously increase the food security of the local residents by planting extensive gardens. Dr. Ponce was kind enough to support my research efforts by taking me to most of the projects and giving me time to interview supervisory community members and participating community members. Combining the research I was able to do with both SEDEREC and Chapingo I was able to visit 48 projects (conducting 36 interviews), serving approximately 1,700 marginalized residents of Mexico City. Food crops were the major agricultural activity I witnessed, though there were also groups involved in livestock production. Among livestock keepers, poultry and rabbits were the most common. I found that urban agriculture is done primarily for three sets of reasons: The first is for subsistence food; the second is for income; the third is for environmental reasons. Most of the groups participated for at least 2 of the above reasons, some for all three
Background

Mexico City has suffered from several recent economic crises, and as a result there has been a sudden upsurge of urban agriculture activities, especially among the urban poor. The government of Mexico City has been working to support urban agriculture activities, believing that urban agriculture can support the deeply affected population groups, thus accepting it as a risk-reducing strategy in time of crisis. Bakker, Dubbeling, et.al briefly talk about some of the differences between developed country urbanization and developing country urbanization trends.

While the western world has already gone through the hot phase of urbanization, with enough time to structurally adjust and build smaller and medium sized centers, many developing countries shortcut this period facing accelerated urbanization at rates that absorb rural population into megacities much faster than organized growth and infrastructural development can cope with. Rural-urban linkage is greatly affected by the lack of balance in this trend, which presents a challenge to sustainable urban and peri-urban development, with a perspective to adapt and integrate concepts of rural development like food security, income generation and sustainability. (Bakker, Dubbeling, et.al 2000)

The government of Mexico City, particularly the mayor, Marcelo Ebrand, supports urban agriculture not only as a way to supplement food access for the poor of Mexico City, but also as a path towards greening the city. He has stated many times, and proven with his actions that he is committed to reducing the pollution of Mexico City. This stance has been met with some skepticism from the average Mexico City citizen, as some believe there are more important issues that should be financed and tackled before something like “greening the city”. There is also criticism that this “greening” only happens in affluent
boroughs of the city and tourist centers where it receives the most attention. However, the vast majority of state-supported urban agriculture projects that I visited were located in the poorest neighborhoods of the city and existed for the benefit of the local community. This could be a result of selection, I was actively seeking out urban agriculture projects that were subsidized by the city, however, I did see projects that were funded by the city, and were located in affluent city centers. As far as I could tell, these projects did not directly involve the low income residents of the city. They were being subsidized by the state, presumably under the mandate of greening the city and reducing pollution.

Urban agriculture can reduce the amount of waste that is generated by the population of 25 million+ people. The consumption of enormous quantities of organic materials brought into cities results in a correspondingly high amounts of organic waste, which accounts for approximately two-thirds of total urban waste (Bakker, Dubbeling, et. al. 2000, Preface). Urban agriculture can recycle this urban organic waste in urban and peri-urban agricultural activities, growing food and closing the nutrient cycle; which reduces the cost of waste disposal and serves as an environmentally responsible solution to some of the vast pollution of Mexico City. Urban agriculture is a tool to maintain green open spaces in urban areas, another of Mayor Ebrand’s stated goals.

This helps to highlight some of the benefits of urban agriculture, which will be further discussed, along with the detriments of and challenges to urban agriculture activities.

Planning, Food Production and Urbanization Trends
There is a growing interest in the connection between community and regional planning, urban agriculture and food access. Urban planners engage in land management, physical planning, land use policy/plans, public consultation, zoning, and municipal land development. They also influence regulations at the municipal level and act as an intermediary between citizens and their local governments (Harris, 2008 quoted in Halloran 2011). All of these issues concern and influence the acceptance of urban agriculture under municipal policy. In 2007 the American Planning Association came out with a set of guidelines that included urban agriculture. They wrote that: “Planners could play the following roles: Support the development of temporary farm stands, urban agriculture projects, and community vegetable gardens on school, park and community centre sites, and near public agency offices and non-profit providers offering health, human and social services. Promote the provision of community garden⁶, urban agriculture projects and community kitchens in multi-family and low-income housing projects (APA, 2007).”

A spring 2000 study on food systems planning⁷ by Pothukuchi and Kaufman found that most planning literature ignores food issues completely. Their literature search was accompanied by a survey of 22 planning agencies in the United States. Of the agencies reviewed only one had significant involvement in community gardens. Only 18% had been involved in food related economic development and none were involved in

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⁶ See Appendix A for a definition of “community garden” in the context used in this thesis.
⁷ See Appendix A for a definition of “food systems planning”.

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agricultural land preservation. Their findings were significant in telling the story as to why urban planning has avoided the urban food system\(^8\) for so long. The researchers grouped the seven reasons that planners gave as to why they were not engaged in the issue (ibid., 2000):

1. It is not directly related to their work;
2. It is not an urban issue, it’s a rural issue;
3. The food system is driven primarily by the private market;
4. Planning agencies don’t receive funding for food systems planning;
5. Food is already abundant in the city;
6. Lack of partners to collaborate with;
7. Lack of knowledge

Food systems planning has emerged as a recognized sector in the planning field in response to the previous gap in knowledge about urban agriculture among urban planners. A growing network of planners and their partners are engaged in strengthening the urban food system (DVRPC, 2010, quoted in Halloran, 2011). Academic programs are sprouting up all over the nation to support this new field of planning interest. One might ask though, why is this important and what is the connection of food production and planning? Many politicians, citizens and planners still view food production as solely a rural activity and reserve urban areas for economic and industrial activity. Because communities were historically based on food production, many city planners and politicians view food production as a step backwards. The purpose of urban planning is to

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\(^8\) See Appendix for definition of “urban planning” and “urban food system”.
provide public access to basic infrastructure which includes housing, roads, parks, etc. Although food is also a basic need, planners have only recently begun to recognize its importance in the urban fabric (Harris, 2008).

Planning policy has a large role to play in determining the acceptance of urban agriculture within a city as it determines where it can happen, who can take part, the rules and regulations that govern the practices of urban farmers, how much public space will be allotted, and the zoning of land. Urban planners also influence how urban farmers use the land and what kind of activities they engage in. Urban planners often determine how much or how little urban agriculture is legally accepted within the city limits. This thesis accepts that urban agriculture is an integral part of the urban environment and cannot be ignored in planning processes; emphasizing the importance of participatory planning for integrating urban agriculture into urban planning.

Limitations of this Research

This research was limited in scope because of time constraints (less than one year) and limited researchers. This study focuses on one specific city and it is important to consider that the experience of this city does not necessarily reflect that of other cities, though it may be applied in similar contexts. The conclusions drawn from this study are specific to Mexico City. The author also has formed her own opinion of urban agriculture, and has done her best to allow the research to inform the outcomes of this project. The project focused on one city and more specifically, a subset of the population of that city, people
specifically involved in urban agriculture, so her opinions also may be biased, as this is work she self-selected and is involved in. It is also limited in quantitative data as the urban agriculture projects in the city had yet to start measuring their yields. They had to approximate much of their yields and therefore the exact nutritional impact is somewhat imprecise.

Layout of Thesis

The first chapter serves as an introduction to this study, discusses methodology, connects urban agriculture to the field of planning, introduces the research question and objectives of the study.

The second chapter is literature review. Literature on planning and economic theories are presented and explored as they pertain to food systems planning; city planning; social justice and the planner’s role in the food security movement. Theories that support urban agriculture activity and theories that are against it, are presented and discussed.

The third chapter explores urban agriculture in Mexico City; the features of modern day food access; modes of agricultural production in the city; the practitioners of urban agriculture; how gender plays a role in urban agriculture and how economic/social status affects the reasons people participate. The economic features of urban agriculture are also introduced including land access, opportunity cost, farming systems, etc. Finally, a summary of the case studies is discussed briefly.

The fourth chapter is dedicated to ethnographic findings, discussion of the specific cases and their importance to the data findings of the study.
The fifth chapter is dedicated to an examination of challenges and barriers of urban agriculture in Mexico City and strategies to negate them, as informed by the research. This chapter also considers impacts on participant’s food security; subject positions; technical support and measuring outcomes. Finally, I move to conclusions and recommendations for further research.
Chapter 2

Literature Review

This chapter considers the themes of the food security, food systems, the economic and ecological impacts of urban agriculture, the use and production of space, and the role of urban planners in urban agriculture development. Theories in support of and against urban agriculture will also be presented towards the end of the chapter.

The World Struggle for the Food System

Understanding the food system in an urban environment can be a complex undertaking. This becomes even more complicated when looking at an urban environment as multifaceted as Mexico City, vibrant with informal micro-food systems. The first part of discovering the food system in Mexico City involves figuring out how people access food, the second part is learning where the food comes from, and how it is transported. How people access food varies by income and social standing, though many folks of all income levels enjoy food from street vendors.

In order to understand food systems and food security, I looked at some of the research that has already been conducted on these subjects. This literature offered a foundation from which I could understand food security and food systems in both macro and micro contexts. Raj Patel (2007 pg. 11) writes about the world food system, identifying the key stakeholders within it. These stakeholders include farmers, activists, consumers, corporations and governments. He also conceives of the food system as an hourglass. The
top of the hourglass is made up of farm operators and farm proprietors; bottlenecking into raw wholesale products, food manufacturers and wholesale grocery; finally spreading into the bottom of the hourglass; retail outlets and consumers.

Figure 4. Food System as Hourglass: Raj Patel, 2007 pg. 11

Patel points out that this concentration of power in the food system is problematic because the big players get to make the rules. They are large enough, powerful enough and wealthy enough to tilt the playing field (p. 14), by having a presence at the World Trade Organization, lobbying governments and in extreme cases, using force to further their economic interests in developing countries. They can also use economic tools such as trade agreements to further their control over the world food system. In the macro food system, the growers and producers of food rarely sell to the actual consumers of food; instead they sell to the various few food processors, who then “add value” to the food and sell it to the groceries. This is interesting in the context of the much smaller food system in Mexico City, there are many instances where there is a less dramatic waist in the hourglass, and fewer middlemen. Food is grown, shipped to the city and then often sold to vendors who then sell it directly to the public. The Mexico City food system looks...
more like; farmer—> vendor—> (street food vendor—>) consumer, (there is an additional processing/milling step with the addition of grains such as corn). In more developed countries the food system looks more like; farmer—> raw wholesaler—> processor/packager—> grocery wholesaler—> retail grocery—> consumer. The food system in developed countries tends to be more formal and include more middlemen, than the food system in the less developed countries, who rely heavily on informality.

Mark Winne, director of the Hartford Food System in Hartford, CT, wrote about his experience working to build the food system of Hartford, CT. Winne began his work with the goal of increasing the food security (“food self-reliance” p13) of the local residents in this extremely low income part of CT. He pursued this mission by organizing community garden projects, farmers markets, nutrition education programs, farm initiatives, food policy councils, community support agriculture projects and eventually in concert with the Greater Hartford Foodshare Commission (GHFC), one of the largest food banks in New England. Winne points out that the issue with GHFC, and the food bank model in general is that “Foodshare bent so far backward to accommodate food donors that at one point....its mission statement changed from a simple affirmation of its desire to end hunger to one that emphasized the need to manage food waste” (p72). Winne continues his critique of the current food bank model by pointing out that these food banks do not solve the systematic causes of food insecurity, but rather are contributing to the food insecurity of the participants by making them dependent on the food provided by the food bank. Essentially the food bank has become a trash disposal system for large food
producers, serving the needs of these producers over the needs of the food insecure. As such, the food banks are an important part of the food system and should be included in discussions about the food security and the urban food system in general. Winne talks about food banks being useful as a stopgap, to tide families over in times of acute need; however, over time, as systemic changes do not happen, a codependency develops; residents become dependent on the food banks, and the donors have become dependent on the recipients. “Both parties were trapped in an ever-expanding web of immediate gratification that offered no long-term hope of eventually achieving independence and self-reliance” (p76).

Winne worked with Catherine Lerza, author of “A Strategy to Reduce the Cost of Food for Hartford Residents”, a report submitted to the city government in 1978; to take a multifaceted approach to increasing the food self reliance of the locals. Lerza’s approach offered an “alternative food system” that included community and youth gardening; solar greenhouses, cold frames and rooftop production; food distribution projects (food buying clubs, co-ops, farmers markets); and a food processing center that included canning, freezing, butchering, etc (p14). Unfortunately, in the early days of the Hartford Food System (before Winne), they had gone into “low-income, non-white neighborhoods full of vacant lots with their well-intentioned, white, paternalistic strategy to start community gardens. But there wasn’t enough neighborhood buy-in” (p17). Through a lot of hard work and community building, the Hartford Food System was able to partner with local, established antipoverty organizations who had community trust and had been operating in
Hartford for decades. Through that partnership, they were able to successfully engage the community in garden and farmers market projects as well as attract an affordable chain supermarket to the area (that was previously lacking one).

Winne and the Hartford Food System were able substantially increase the self-reliance of Hartford residents using a multi-pronged approach that included policy changes; community gardens; a food policy council; attracting new supermarkets and farmers markets; new co-ops; food banks; and nutrition education programs. Those changes have held steady over the years, and have proven to be sustainable for the community, even as Winne eventually left to work in other arenas. Some of the tools Winne used to increase the self-reliance of the Hartford residents can be applied in Mexico City. Using an asset-based approach, Chapingo, SEDERECA and other potential funding entities could engage the local community within the delegaciones in capacity building and the establishment of an alternative food system.

Some of the projects that I saw were already engaging in informal food system activities. For instance, many of them sold a handful of radishes, or a bunch of cilantro here or there to whomever stopped by and asked. Cooperative tianguis9 could be organized in which to sell affordable, organic food to the local residents. I actually visited one such tiangui in

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9 Tianguis a Nahuatl word that means open air market. It is an informal flee market that springs up in neighborhoods on Saturdays or Sundays. The tiangui tradition predates the Hispanic era.
Texcoco\textsuperscript{10}, it was organized by Chapingo, and featured local, organic food at very affordable prices. This tiangui also featured value-added products; there was honey and cosmetics made from honey; canned and pickled vegetables; pulque\textsuperscript{11}; roasted, seasoned grasshoppers; raw, mexican-style chocolate; butchered rabbit; and various cheese products. This tiangui was located in a very low income section of the city, operated only on Sundays and was advertised solely through word of mouth in the community.

According to one of the vendors that I spoke with, the closest traditional food market was a 20 minute bus ride and it only operated on Saturdays and nearest supermarket was at least 30 minutes by pesero\textsuperscript{12} and metro. The community had organized and built their own alternative neighborhood food system. This is similar in spirit, but different in practice than Hartford; Hartford worked specifically to attract a grocery store to the area, but they also organized and instituted new farmers markets, much like the organic tiangui the community in Texcoco organized.

**Urban and Community Planning**

Mexico City grew swiftly through the 1940s, driven by the pull of booming industry, and the push of ineffective rural policies that left many rural inhabitants without work, in deep poverty, and pouring into the city for work. These economic conditions lead to rapid population growth and vast informal settlements. Some of these informal settlements

\textsuperscript{10} Where the University of Chapingo is located, in Mexico State, about 30 minute bus ride from Mexico City.

\textsuperscript{11} An alcoholic beverage made from fermented agave sap.

\textsuperscript{12} Small buses, also called microbuses or micros.
were eventually incorporated into the city infrastructure, while other neighborhoods remain disenfranchised, cut off from even the most basic services provided by the city. In many of these disenfranchised parts of the city, the people have organized themselves and an informal community hierarchy exists. There is a fierce independence that the neighborhoods take great pride in. Many of the neighborhoods are resistant to change, and especially resistant to outsiders coming in and trying the make the neighborhoods “better”. Jane Jacobs (1961) pushes back against the planning norms of the 1960s, planning norms that are still in practice today, such as uniformity of buildings, planning for city parks and assumed/forced community areas like game rooms in apartment buildings. She asserts that the real community building happens on the streets, the pavements. That this community building is fluid and natural and leads to trust building between neighbors. Jacobs writes about the importance of diversity on the streets, diversity in income levels, diversity in building types, sizes, shapes and uses. This diversity keeps urban decay at bay and encourages neighbors to take to the streets, supporting the development of safe and vibrant streets. Jacobs writes that local residents will create more livable and more effective neighborhoods than any master plan conceived by we-know-better-than-you urban planners. Moreover, such neighborhoods can more effectively adjust, bit by bit, over time as new conditions arise.

When viewed through the lens of Jacobs, these urban agriculture and community gardens could be perceived as both vibrant community spaces, or forced community spaces, depending on their origin. 60% of the community gardens that were observed and
surveyed for this thesis had grass roots inceptions. They were conceptualized by local, small-scale community leaders that independently went to the city to gain funds for these projects. These gardens became gathering places for the community and are wildly successful. Then we have the remaining 40% of community garden projects that were studied for this project. They were often conceptualized by outside not-for-profits who were well intentioned, but ultimately ignorant to both community dynamics and neighborhood needs and desires. This origin led to loss of interest, decreased community involvement and eventual abandonment of the project.

To further understand the role of planners in urban agriculture and food system planning, it is important to understand theories on the appropriation of space. Harvey (1991), inspired by Lefebvre (1974), writes about a grid of spatial practices; 1) The accessibility of space-urban hierarchies, space as a barrier to human interaction, etc.; 2) the appropriation of space- the way space is occupied by objects and territorially bonded forms of social solidarity; 3) the domination of space- the way that powerful groups or individuals dominate the organization and production of space, through legal and extra-legal means; and 4) the production of space- how new systems of land use, transport, and communications are produced. Harvey explains:

"My purpose is to find some point of entry that will allow a deeper discussion of the shifting experience of space in the history of modernism and postmodernism. The grid of spatial practices can tell us nothing important by itself. To suppose so would be to accept the idea that there is some universal spatial language independent of spatial practices. Spatial practices derive their efficacy in social life only through the structure of social relations within which they come into"
play. Under the social relations of capitalism, for example, the spatial practices portrayed in the grid become imbued with class meanings” (p. 222).

### Table 2. Grid of Spacial Practices (Harvey, 1991 pg. 222)

<table>
<thead>
<tr>
<th>Accessibility and Distanciation</th>
<th>Appropriation and Use of Space</th>
<th>Domination and Control of Space</th>
<th>Production of Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material Spacial Practices</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(experience)</td>
<td>flows of goods, money, people, labor, power, information, etc.</td>
<td>land uses and built environments</td>
<td>private property in land</td>
</tr>
<tr>
<td></td>
<td>transport and communications systems</td>
<td>social spaces and other “turf” designations</td>
<td>state and administrative divisions of space</td>
</tr>
<tr>
<td></td>
<td>market and urban hierarchies</td>
<td>social networks of communication and mutual aid</td>
<td>exclusive communities and neighborhoods</td>
</tr>
<tr>
<td></td>
<td>agglomeration</td>
<td></td>
<td>exclusionary zoning and other forms of social control (policing and surveillance)</td>
</tr>
<tr>
<td><strong>Representation of Space</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(perception)</td>
<td>social, psychological and physical measures of distance</td>
<td>personal space</td>
<td>production of physical infrastructure (transportation; communications; built environments; land clearance, etc)</td>
</tr>
<tr>
<td></td>
<td>map-making</td>
<td>mental maps of occupied space</td>
<td>territorial organization of social infrastructure (formal and informal)</td>
</tr>
<tr>
<td></td>
<td>theories of the “friction of distance” (principles of least effort, social physics, range of a good, central place and other forms of location theory)</td>
<td>spatial hierarchies</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>symbolic representation of spaces</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>spatial ‘discourses’</td>
<td></td>
</tr>
<tr>
<td><strong>Spaces of Representation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(imagination)</td>
<td>attraction/repulsion</td>
<td>unfamiliarity</td>
<td>utopian plans</td>
</tr>
<tr>
<td></td>
<td>distance/desire</td>
<td>spaces of fear</td>
<td>imaginary landscapes</td>
</tr>
<tr>
<td></td>
<td>access/denial</td>
<td>property and possession</td>
<td>science fiction ontologies and space</td>
</tr>
<tr>
<td></td>
<td>transcendence</td>
<td>monumentality and constructed spaces of ritual</td>
<td>artists’ sketches</td>
</tr>
<tr>
<td></td>
<td>‘medium is the message’</td>
<td>symbolic barriers and symbolic capital</td>
<td>mythologies of space and place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>construction of ‘tradition’</td>
<td>poetics of space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>spaces of repression</td>
<td>spaces of desire</td>
</tr>
</tbody>
</table>

Using Harvey and Lefebvre’s framework on space, each of these spatial practices can be applied to urban agriculture projects. For example: 1) The accessibility of space; urban agriculture projects sometimes suffer from competition for space. Space is often at a
premium in urban environments, urban agriculture projects have sidestepped this
competition by using blighted and abandoned lots for their projects. Occasionally there is
further competition once the land has been rehabilitated and the project is successful and
beautiful; as the original landowner or neighborhood will try to reclaim and gentrify it.

2) The appropriation of space; when designing or proposing an urban agriculture project,
it is vital for the project managers to be aware of the current appropriation of the space
that will be occupied by the project. In other words, they must look at how the space is
being used in the context of the neighborhood, and whether or not the neighborhood is
open to a change in the use of that land. For example; several small garden boxes were
planted in-between buildings in a low income housing project by the housing authority
leaders, without ever consulting the people living there. The residents soon complained
because they had used those in-between areas to hang laundry to dry, to let the kids play,
or even just to socialize. The residents decided not to participate in the community garden
boxes, and as a result, this project failed.

3) The domination of space; occasionally, the
local leaders in the community where an urban agriculture project is being proposed, will
have differing opinions as to the use of that land. A few of the case studies for this thesis
suffered because of the illegal (extra-legal?) domination of space. For example; one local
political leader wanted to turn the space into a park with a playground, the other wanted
an urban agriculture project/community garden. The community garden won out, but the
other political leader and their supporters destroyed the garden shortly after it was
planted.

4) The production of space; a community garden is a relatively new use of land,
especially on blighted or abandoned city lots. Urban agriculture projects can serve to
rehabilitate empty city lots that may have been previously unused, or used for less than desirable urban practices such as trash dumping. There is great success at building neighborhood relationships and communication if the community is engaged in the project, or even better, if they conceptualized the project themselves.

What Is The Role of the Planner?

The food system is perhaps a less visible part of the urban fabric than transportation and housing issues, however it is still important to the quality of life of the urban residents. Because of its inherent complexity and almost ambiguous nature, the food system is seen more as a commodity in a macro, world-view context. In 1997, Pothukuchi and Kaufman (cited in 2000) conducted a study with a group of graduate planning students at the University of Madison-Wisconsin and they found that “…the food system was extraordinarily important to the health and vitality of communities” (p.113). They go on to state that “Planners have the professional expertise and community-oriented and interdisciplinary perspectives that potentially could strengthen community food systems and food system planning” (p. 119). They assert that planners can strengthen food systems by: 1) compiling data on the community food system; 2) analyzing connections between food and other planning concerns; 3) assessing the impact of current planning on the local food system; 4) integrating food security into community goals; and, 5) educating future planners about food system issues (p. 120). Campbell (2004) writes that a community food assessment framework, used to analyze community food issues in the context of land use, is an ideal tool for planners given the parallels with comprehensive
planning analysis (p. 352). Pothukuchi (2004) has published a useful graphic (p. 361) to illustrate how food system assessments can be done by planners to increase the strength of the local food system.

“Community food security calls for greater local integration of food system links and envisions food as a tool for achieving community objectives in health, economic development, equity, and sustainability. Individual members of a community, community-based organizations, public agencies, and the private sector all have roles to play in enhancing a community’s food security” (Pothukuchi, 2004).
According the American Planning Association, the role of urban planners in urban agriculture is the following: 1) to address urban agriculture as a component of land-use and food policy in planning processes; 2) to create, enable, or fund community garden programs and urban agriculture organizations; and, 3) To create zoning and permitting processes that are friendly towards urban agriculture. It is important for planners to become involved in this subject because of their wide perspective on cities and community, and how they function in a larger context. An effective food system will have positive effects on hunger and poverty, community building, land use and many other issues that are traditionally thought of as in the planner’s realm (APA, 2010). The planner has the unique ability to connect food system issues with community goals such as community building, economic vitality, livability and healthy communities. This ability to integrate food systems into the larger community goals is part of why planners are so vital to local food systems councils and planning.
Chapter 3
Case Overview

Summary of Study

I looked at the distribution of urban agriculture in various socio-economic areas of the city (including an evaluation of who farms and where), the impact of food and nutrition security, environmental aspects of urban agriculture, contamination of food for human consumption and the social impacts of urban agriculture. Many of the projects observed were strong in building local partnerships, though there were partnership opportunities that were lost because of the inability of institutions (government and educational) to work together. The largest challenges I witnessed were; breakdowns in social organization, loss of interest from project members and lack of technical knowledge. Unfortunately, a reluctance to participate in physical labor (both from a lack of desire and from the received stigmas associated with farm work) appeared to affect many projects keeping them from reaching full potential. Time is also an issue preventing project workers from tending their gardens, instead earning income or tending to households. Many project leaders stated that they struggled to find technical knowledge while producing crops they were not accustomed to producing.

Environmental challenges were also evident, including poor soil conditions or water shortages, which permitted very limited production levels. Other less serious challenges
included malfunctioning irrigation systems, complaints from neighbors and persistent pests.

An issue that came up repeatedly was the question of appropriation of funds by the city. Many of the interviewees were perplexed by the fact that the city wanted to dump money into urban agricultural projects when so many of the city residents are living in abject poverty without even the most basic services, such as trash service or running water. Some of the participants themselves did not have electricity or running water in their homes. Several of the community gardens installed composting toilets with guidance from the University of Chapingo and funding from SEDERECE. Interestingly, these were sometimes more widely used than the garden itself. One could argue that food is more important than electricity, running water or trash service; however, the gardens do not provide 100% of the food for 100% of the residents. Trash service would provide service for all of the residents, not just the ones who put forth the effort (as in the garden). The perception by those in the neighborhood is that the city/delegación is more interested in “greening the city” and publicity, than it is in really serving the residents. Again, this is the perception of some of the local residents that I chatted with, informally. More formally, there were several interviewees who told me that some of the vandalism their gardens had experienced were rooted in frustration at the delegación for installing an (unwanted) community garden when there is so much other need. This is a reminder that social and political context matters.
History of Food Access and Agriculture in Mexico

Mexicans have a long and diverse agricultural history and Mexico City has been an agricultural city since it was founded on a small island in the middle of the huge, salty Lake Texcoco. Ancient Mesoamerican staple crops included the “Three Sisters”; maize, beans and squash. Chilis and tomatoes were often added and remain prominent parts of the modern Mexican diet. As explained to me by Dr. Pedro Ponce; ancient Mesoamerican indigenous people grew maize, beans, and squash in what is called a *milpa*. *Milpa* agriculture consists of maize and beans being planted together in the same hole while squash is planted between the maize stalks. As the maize stalk grew, the bean vines wrapped around the stalk. Squash covered the ground around the stalks to reduce the amount of weeds and keeps the soil cool and moist from the sun (Coe 1994).

For much of history, Mexican society has been divided into fairly distinct upper and lower strata, and these two strata ate different foods. The rich benefited greatly from imported food diversity. The poor, particularly the indigenous, ate mostly beans, corn tortillas, and other things acquired locally.

With the advent of trade agreements, more middle and low income Mexicans have access to imported food, particularly highly processed foods. A new type of Mexican dietary taste is developing and this taste appears to be driving Mexican cuisine into yet a new direction, a northern one. Former tortilla eaters are becoming patrons of white bread and pre-toasted white toast. Coca Cola has taken over traditional drinks such as *agues frescas* as the national favorite. Hamburgers, Doritos, fried chicken and other assorted American
fast foods are hugely popular and as a result Mexico is becoming ever increasingly
dependent on a corporatized food system (Patel, 2008, p. 63).

**Landscape of Modern Day Access to Food**

The way that urban Mexicans access food has not changed much over the last 20 years.
Food is present in one form or another all over the city center, on every corner, in every
tiny stand. At first glance, it would be hard to call the local urban residents “food
insecure,” yet much of the food that they have easy access to is heavily processed. There
are street tacos and fruit vendors easily present in the center of the city, but once you get
to the further delegaciónes of the city, where the poorest people live, these food outlets
become fewer and further between.

In my research I found that there are several ways that people in Mexico City access
food, dependent on several factors including economic standing, locale, personal dietary
habits, personal priorities and social standing. For example, an educated, affluent couple
from Mexico City’s delegación Coyoacán accessed food on a daily basis through several
different venues. They grew approximately 65%-80% of their own organic vegetables
because they were very environmentally aware and they also did not want any added
toxins in their meals. They sourced the rest of their food from a local butcher and from an
environmentally friendly (and very expensive) “Green Market” several blocks from their
residence. The couple would also occasionally eat out at one of the many trendy
restaurants in Coyoacán as well as a late night taco stand snacks and early morning fruit smoothie or juice breakfasts.

Another example is a more typical, working class family of 5 in a lower middle class neighborhood in the delegación Magdalena Contreras. The father is security guard, and the mother works part time in a retail store. This family participates in a community garden project that is subsidized by the city government. Because of the constant growing season, they are able to source approximately 35-50% of their vegetable needs from this community garden almost year round. The rest of their food is bought on weekends at local open air neighborhood tianguis, or marketplaces. There is a Saturday tianguis located only a few blocks from where the family resides. They also source some of their food already prepared at local taco stands, chicken rotisseries and fruit smoothie stands.

The final example is a very poor family of seven (including two grandparents) in the delegación Iztapalapa. This family represents some of the poorest in the city (not quite the poorest) as this family has a shack to live in (no running water) with a piece of tin as a door. The father is underemployed working construction, the mother cleans the houses of middle class Mexicans when they have work for her, and the grandparents take care of the children. This family accesses food in several creative ways. One way is through a government program that provides cheap lunches, it is similar to a restaurant, but the food is subsidized by the government, only costs 10 pesos, only serves one meal and is open to anyone. It is akin to a soup kitchen in the US. The family also makes a weekly or bi weekly trip via several buses and the subway, to the Centro de Abastos a gigantic
wholesale marketplace where huge trucks full of produce are distributed from farmers to “middle men”, food vendors and prepared food vendors throughout the city. The Centro de Abastos is open to anyone, and this family’s meager income stretches the furthest shopping for their food there. They rarely eat at taco stands, feeding seven people at a prepared food stand can be more expensive than they can afford, though the father does occasionally while at work. I met this family because they are participants in a new community garden project in Iztapalapa. They are hoping to source near 80% of their vegetable/herb needs from this garden project.

These examples represent a sampling of the wide variety of ways one can access food in modern day Mexico City. As illustrated, access to food is mostly constrained by economic status. The vast majority of food that people in Mexico City (and all major cities) eat is grown outside of the city, although unlike the US, most of the food is produced in Mexico, often in neighboring states. There are many subsets within these three examples that source food from all over the spectrum, and I will expand more on the identity of these groups of people in Chapter 4.

**Economic Features of Urban Agriculture**

Urban agriculture has several complex economic features to explore. The economic output can be difficult to measure because it is dependent on the participants’ ability and desire to monitor and record the amount of food being produced. In this particular research project, exact yield value was not determined because very few of the projects
studied had the motivation or knowledge to track their production. In most of the projects studied, the participants expressed a desire to learn to measure their yield, and near the end of the research period, efforts were being made to train the participants to measure output.

Table 3. Economic Benefits and Costs of Urban Agriculture. (Nugent, 2001 pg. 5)

<table>
<thead>
<tr>
<th>Benefits of Urban Agriculture</th>
<th>Costs of Urban Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural Production</strong></td>
<td>Inputs: Natural Resources</td>
</tr>
<tr>
<td>• Marketed</td>
<td>• Land, rented or purchased</td>
</tr>
<tr>
<td>• Non Marketed</td>
<td>• Land, vacant or donated</td>
</tr>
<tr>
<td>• Water</td>
<td><strong>Indirect Economic Benefits</strong></td>
</tr>
<tr>
<td></td>
<td>Inputs: Labor</td>
</tr>
<tr>
<td>• Multiplier Effects</td>
<td>• Wage and Salary Labor</td>
</tr>
<tr>
<td>• Recreational</td>
<td>• Volunteer, Unemployed and Contributed Labor</td>
</tr>
<tr>
<td>• Economic Diversity/Stability</td>
<td><strong>Social and Psychological Benefits</strong></td>
</tr>
<tr>
<td>• Avoided solid waste disposal costs</td>
<td>Inputs: Capital and Raw Materials</td>
</tr>
<tr>
<td>• Food Security</td>
<td>• Machinery and Tools</td>
</tr>
<tr>
<td>• Dietary Diversity</td>
<td>• Fertilizer and Pesticides</td>
</tr>
<tr>
<td>• Individual psychological benefits</td>
<td>• Seeds and Plants</td>
</tr>
<tr>
<td>• Community Cohesion</td>
<td>• Energy (fuel oil?)</td>
</tr>
<tr>
<td>• Job Training</td>
<td><strong>Ecological Benefits</strong></td>
</tr>
<tr>
<td></td>
<td>Inputs: Pollution and Waste</td>
</tr>
<tr>
<td>• Hydrologic Function</td>
<td>• Soil Quality Impacts (if pesticides used)</td>
</tr>
<tr>
<td>• Air Quality</td>
<td>• Air Quality Impacts</td>
</tr>
<tr>
<td>• Soil Quality</td>
<td>• Water Quality Impacts</td>
</tr>
<tr>
<td></td>
<td>• Solid Waste and Wastewater Disposal</td>
</tr>
</tbody>
</table>

Opportunity cost is often brought up when determining the economic cost/benefit of urban agriculture. Opportunity cost means that for every choice to work longer hours, or start urban gardening, something is gained and something is lost. This sacrifice-forgone leisure, forgone private sector output-is an opportunity cost (McConnell et. al 2006). When applying this theory to urban agriculture, the opportunities available to the participants are first determined. The participants have to determine whether it would be
more economically beneficial for them to work a second job, work longer hours at their
current job; or participate in a garden program/grow food in their own backyard. Because
of the extremely high rates of unemployment and underemployment in Mexico City,
there often was not the opportunity for the participants to work a second job, or to work
longer hours at their current jobs. Also, many of the participants were retired, stay at
home parents, or part of the unskilled labor force. With so little opportunity for
employment, participating in the urban agriculture program is a viable alternative towards
increasing their wealth.

One economic feature that is often overlooked is the upstream and downstream effects of
urban agriculture on the local city economy. Urban agriculture contributes to the
economy of a city both as a user of inputs, such as fertilizer, soil, etc. (upstream) and as a
producer of inputs (downstream) for other economic entities (providing lettuces to
restaurants, selling some of the produce or eggs, etc.) (Nugent 2000). These upstream and
downstream effects on the city’s economy have become significant income generators for
some of the city’s inhabitants.

Access to Land

There are many types of uses competing for urban land, especially in a highly urbanized
city such as Mexico City, where sufficient arable soil comes at a premium. Participants
have found creative ways to grow food in the concrete jungle. These include rooftop
greenhouses, rooftop and patio container gardens, raising rabbits and chickens, and
extensive hydroponic gardens. Urban agriculture projects gain access to land using a variety of techniques including land grants, environmental grants, private land use permits, public land use permits, borrowing, renting, squatting, city beautification ordinances, etc. There is widespread support for urban agriculture projects in Mexico City, especially in the city center, the main purpose of them being city beautification and environmental education. The urban gardens in the more marginalized outskirts of the city tend to be in ground plots and container gardens on community property, or abandoned urban land.

Figure 6. Land Cover in Mexico City (Torres-Vera, 2008)
Chapter 4

Ethnographic Findings

Summary of Stories

When I began research in Mexico City, I was interested in learning how the people of the city accessed food, particularly poor and underprivileged citizens. From where I was staying, there seemed to be inexpensive food available on every corner, but it became apparent to me that this was because I was living in a middle-class, somewhat touristy part of central Mexico City. I wanted to explore the intersections between food justice, gender, and class in Mexico, but I did not know exactly what shape my analysis would take. As I was introduced to various urban agriculture programs I began to build relationships with the coordinators and participants, and eventually asked for, and was granted, interviews and extensive observation. Through my contacts with SEDEREC and Chapingo, I conducted 36 interviews with garden supervisors, coordinators, participants, funders and support (agronomists) people.

The relationship between SEDEREC and Chapingo was a complicated one. I was unable to interview any of the supervisors within SEDEREC, but I did speak informally with several of the technicians. I was given assorted versions of what happened between SEDEREC and Chapingo, and have done my best to look at the situation objectively. As far as I can ascertain, there was a struggle for who accepts the credit and the blame for the outcome of the projects. For example, the community leader of one nonfunctioning
project told me that Chapingo bought bad soil and that was the cause of the garden’s failure. A technician from Chapingo told me that the soil came from SEDERECE’s contractor. They could both agree that the soil was bad, but not where it was sourced. This is just one example of finger pointing between the two entities; The struggle for recognition was a recurring theme. It was clear that several of the garden leaders were wary and mistrustful of SEDERECE, I am not sure if this was based in specific experience or a general mistrust of the government, I suspect both.

All names have been changed to protect the privacy of the participants, with the exception of Rodrigo Canovas, Dr. Pedro Ponce, and Dr. Ponce’s assistant, Mercario, as they preferred to be identified. Interviews lasted between 30 minutes and 2 1/2 hours and were digitally audio-recorded and transcribed. These interviews allowed me to compare my observations of participants’ behavior to their reflexive understandings of their own identities, world-views, reasons for participating and in some cases; social change goals. A copy of my interview questions and disclosure form are included in Appendix B and several more case summaries are also included in Appendix D.
<table>
<thead>
<tr>
<th>Project</th>
<th>Organization</th>
<th>Mode of Production</th>
<th>Primary Food Products</th>
<th>Food Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revolutionary Soil</td>
<td>Community Gardening Cooperative</td>
<td>• Raised beds</td>
<td>• Vegetables</td>
<td>• Personal consumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Limited hydroponics</td>
<td>• Melons</td>
<td>• Occasional sale to the community</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compost</td>
<td>• Greens</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Vermicompost</td>
<td>• Corn</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rainwater Harvesting</td>
<td>• Beans</td>
<td></td>
</tr>
<tr>
<td>Greenhouse With a View</td>
<td>Solo/Family Growers</td>
<td>Hydroponics</td>
<td>Speciality lettuces</td>
<td>• Mostly sold to local gourmet restaurants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Excess consumed by family members</td>
</tr>
<tr>
<td>Barrancas San Borja</td>
<td>Community Gardening Cooperative</td>
<td>• Raised beds</td>
<td>• Vegetables</td>
<td>• Community consumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plots</td>
<td>• Nopales</td>
<td>• Harvested food distributed to low-income elderly community members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hoop houses</td>
<td>• Melons</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rows</td>
<td>• Herbs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compost</td>
<td>• Greens</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rainwater Harvesting</td>
<td>• Beans</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• Corn</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Fruit Trees</td>
<td></td>
</tr>
<tr>
<td>Los Brujos: Regresando a Tus Raices</td>
<td>Community Gardening Cooperative</td>
<td>• Recycled containers on patios</td>
<td>• Vegetables</td>
<td>• Community consumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Raised beds in public parks</td>
<td>• Corn</td>
<td>• Some of the produce used to feed the rabbits and chickens</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mixed raised beds and containers in shared unidade patios</td>
<td>• Herbs</td>
<td>Excess harvest is sold at a garden stand that pops up weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hoop houses</td>
<td>• Greens</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Chicken coops</td>
<td>• Rabbit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compost</td>
<td>• Chicken</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rainwater Harvesting</td>
<td>• Greens to feed rabbits</td>
<td></td>
</tr>
<tr>
<td>Turkeys and Tianguis</td>
<td>Family Growers (approximately 36 family members participating)</td>
<td>• Containers</td>
<td>• Turkey</td>
<td>• The food is consumed by the family members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Raised beds</td>
<td>• Chicken</td>
<td>• Rabbit meat is sold at a local tianguí (Market)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Coops for chickens/rabbits</td>
<td>• Rabbit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Chicken/rabbit manure used for fertilizer</td>
<td>• Greens/food for rabbits</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Vermicompost</td>
<td>• Cilantro</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Corn</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Vegetables</td>
<td></td>
</tr>
<tr>
<td>Project</td>
<td>Organization</td>
<td>Mode of Production</td>
<td>Primary Food Products</td>
<td>Food Consumption</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------</td>
<td>-------------------------------------</td>
<td>-----------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Paola's Fresh Start</td>
<td>Community Gardening Cooperative</td>
<td>• Raised beds</td>
<td>• Vegetables</td>
<td>• Food is consumed by community participants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Containers on patios</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tierra Nueva</td>
<td>School Garden</td>
<td>• Raised beds</td>
<td>• Vegetables</td>
<td>• The food is consumed by the students</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Compost</td>
<td>• Greens</td>
<td></td>
</tr>
<tr>
<td>Growing Soil</td>
<td>• A small, women-owned business that promotes</td>
<td>• Container gardens</td>
<td>• Vegetables</td>
<td>• Food is consumed by the participants</td>
</tr>
<tr>
<td></td>
<td>Urban Agriculture Education</td>
<td>• Hoop houses</td>
<td>• Greens</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Raised beds</td>
<td>• Corn</td>
<td>Some produce is sold to a local organic grocery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Greenhouses on rooftops</td>
<td>• Herbs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Vermicompost</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rainwater Harvesting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban Rabbits</td>
<td>• Family Growers</td>
<td>• Coops for Rabbits and Chickens</td>
<td>• Chicken</td>
<td>• Meat is consumed by the participants</td>
</tr>
<tr>
<td></td>
<td>• Community Education</td>
<td>• Raised beds</td>
<td>• Rabbit</td>
<td>• Meat is sold to the local community</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Containers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Barrancas San Borja.*

The way I happened on the *Barrancas* projects seemed rather serendipitous to me at the time. I had been in Mexico City for just over 2 weeks (the first time) and was struggling...
to make contacts for the urban agriculture projects that I knew existed, but couldn’t find.

A local friend of mine, brought in an article on the Barrancas from a local newspaper, and we worked from there to contact the delegación government and get permission to visit the budding garden. From there I was introduced to Dr. Pedro Ponce, a professor and accomplished agronomist from the University of Chapingo. Dr. Ponce was instrumental in introducing me to more urban farmers and projects in Mexico City and was key in furthering my research and widening my sample pool. During his interview, Dr. Ponce explained his interpretation of food security to me and how it applies to the people of Mexico City:

“Food security has first to do with mental and emotional survival, the desire to be self-sufficient, to not feel despair. A city has to decide for itself what to produce, whether or not it is supported politically and what types of production they will utilize. They need to be independent of other cities and groups of people. They need to define how why and what [they will produce]. This independence is based on the basic basket of goods, the minimal food necessities for a person. This is based on the nutrition that the family needs; the proteins, the vitamins, the amino acids. What urban agriculture produces should contribute to nutritional self-sufficiency. In this city we have around 20 million Mexicans in nutritional poverty, this means that what they earn is not enough to cover their basic nutritional needs. They are food insecure.”

A barranca is a ravine, or a canyon. In the delegación Álvaro Obregon there is an extensive network of barrancas. These canyons are a vital part of the ecosystem of Mexico City. They serve to recharge the aquifers underneath Mexico City. Dr. Ponce described the income disparity in Álvaro Obregon to me. He said it is home to some of the richest people in the city, several multinational corporations such as Grupo Bimbo have their headquarters in Álvaro Obregon. However, the poorest of the delegación live in informal settlements, some of which have been integrated and formalized, but were
still made of informal materials, i.e., concrete blocks, found material scraps. Many of the poor live without electricity service, except the service they sometimes steal by finagling patchwork electrical wires patched into power poles. They also lack sufficient water, sewage and trash services. A combination of these and other factors has led to the use of the *barrancas* as a trash system. Dr. Ponce told me that it is common in Mexican history to throw trash away in rivers and the heavy industry is situated near rivers so all of the industrial waste could be swept away. It is with this mentality that the residents of Álvaro Obregon began to use the barrancas as trash disposal. They would fill up the ravines and the rains would come and wash the trash away. The low income residents do not have enough access to trash removal, and many of them do not own cars, so they had no other way to get rid of their trash, to them this was a logical way to dispose of unwanted things, including dead animals.

Dr. Ponce told me that they “did a basic study and found out that many of the families in this area cannot afford milk. That they don't consume vegetables, and in some cases they cannot afford the "second vegetables" (vegetables that have passed their eat by date)”. He explained the goal of the *barrancas* project, “We want to build an agro-system. With human intervention and conservation of the environment, we also want to be able to grow food without disrupting the balance of the ecosystem. We wanted to rehabilitate the Barrancas, to restore their beauty and while doing so, we wanted to provide food for the community and to give the community pride”. The people who live in the poorest parts of Álvaro Obregon were mostly un-or, under-employed; there is a very high rate of violent
crime, and drug activity. I was warned against going into the area where the barranca gardens are, alone. I also got the feeling that they weren’t warning me in some kind of over-worried, or over-anxious matter, they (government officials and Dr. Ponce) were serious that it was a dangerous area and I need to have an escort when I visit. On one of my visits with Chapingo officials, I witnessed drug deals going on and young men with firearms. The physical environment was also indicative of a community without sufficient resources; piles of trash, burning trash, graffiti, informal patchwork buildings, dilapidated roads, abandoned parks.

This was my understanding of the process: At some point (exactly when was unclear), the wealthy people and the politicians in Álvaro Obregon recognized the threat to the environment that these trash filled ravines posed. They had some environmental studies done that outlined the potential problems for the city if the aquifer was not allowed to recharge, and the potential chemicals that were being leached into the aquifer. This concerned the powerful government officials and community leaders in the delegación and they decided to clean up the barrancas. I am under the impression that the impetus towards food security and urban gardening came from Dr. Ponce. Up to this point he had been working with SEDEREc in various locations in Mexico City to create urban gardens in poor communities, however, there were disagreements regarding technical assistance, community engagement, etc. between Chapingo and SEDEREc and that relationship was severed by the time this project took shape. After much discussion with academics at the Chapingo and UNAM, a decision was reached to involve the community
and to also work towards increasing the food security of the residents through an urban gardening program. This took place in steps: 1) A massive trash cleanup, the delegación paid trash removal professionals to take the majority of the trash out, including dangerous trash and large items such a car frames, etc., 2) Community cleanup day; the local immediate community spent a day cleaning up residual trash. 3) Soil remediation (phytoremediation) and removal. Sunflowers and grasses were planted and removed at least three times. Next, the topsoil was removed and new soil and compost was put down.

4) Community leader meetings. The academics from UNAM and Chapingo met with local community leaders first to ascertain the community’s interest level in a community garden. 5) Community meetings. The community leaders and academic advisors set community meetings and gave a presentation on urban gardening and showcased the potential of these programs. The community then made a decision as to whether or not they wanted to participate in the program. They then voted on what plants they wanted to plant, with an emphasis on “proteins, vitamins and amino acids, such as corn, beans, milk, vegetables, fruit.”

6) Community workday. The community worked with technicians from the delegación and from Chapingo to create beds, lay soil and plant. 7) A couple of main caretakers were identified from within the community who would go on to lead and supervise the garden as it unfolded. These caretakers were trained extensively by technicians from Chapingo and they then worked to train other interest community members. 8) Once the garden was up and running smoothly, Chapingo tested the first harvests to make sure they were safe to eat and then the garden was turned over to the
community, to be maintained and cared for by the community with full technical support from Chapingo as needed.

The main caretaker that I had the opportunity to speak with was Don Emilio. He was a local community member in his late 50s who was recently unemployed and recovering from a surgery. He mentioned that he had been in a deep depression when he heard about this project. He attended the meetings and he knew instantly that this was something he was interested in being involved in. So he got involved and he said it has been the best occupational therapy he’s ever had. He explained that the harvest goes to the community members who participate and that they also deliver produce for free to elderly impoverished members of the community. He also told me that anyone can stop by the garden and ask for food and that they will not be denied. When there was a surplus of harvest, the food was distributed throughout the wider neighborhood, as far as I could ascertain, none of the food was being sold at that time. Don Emilio also told me that there was a small group of vecinos (neighbors) who strongly oppose the garden. As he explained it to me, this group was comprised of a rival political party, the PAN; the delegación was under the rule of the PRD at this moment. The PRD was also the party who initiated this cleanup and therefore the PAN was opposed based simply on partisan objection. That was the only reason he gave me for the displeasure of the group of vecinos.
In the summer of 2009; there were some vegetables that were ready to harvest, but the majority of plants were just starting to flower, the garden was still new. In the summer of 2010 there were 4 huge hoop houses full of squash, melons, herbs, tomatoes, chard and beds with fruit trees, and many other vegetables, and _nopales_. They were gathering rainwater and had an extensive drip irrigation system set up in tiers; the plants that needed the least amount of water were planted at the top of the _barranca_\textsuperscript{13} the plants that needed the most water were planted at the bottom. This way the water trickles down and accumulates among the thirstiest plants. Everything was organic, the technicians from Chapingo taught the community to use herbs and aromatic plants as pest control and it was widely successful at this project.

I also visited another _Barranca_ project, this one still in development and currently in the soil remediation phase. This one was more polluted than the other one was and the delegación was planting phytoremediation plants to grow and suck up the lead and arsenic in the soil. When I saw it, it looked like a beautiful field of sunflower and grass. These phytoremediation plants will be grown, harvested and safely disposed of by Chapingo technicians for several cycles until the soil tests as safe. I did not speak to any community members at this project.

\textsuperscript{13} The _barrancas_ are inclined, see Figure 5.
Los Brujos: Regresando a Tus Raíces

This is the summary of two separate projects, with one technician/leader in common. One of these projects has achieved long-term sustainability and acceptance in the community, the other was non-functioning.

Rodrigo Canovas picked me up in an ancient pickup truck outside a subway station on the edge of the delegación Coyoacan. He was a young, articulate urban farmer with a friendly, but serious disposition. He took me to a unidad where we saw a patio garden project bustling with activity. That day was a workday, the involved community members were out in force, planting seeds, turning compost, harvesting peppers, tomatoes and cilantro, and cleaning tires to be used as planters. This project was conceived and funded by a non-profit called Circulo Verde, headquartered in Mexico City. Rodrigo was working for them and educating interested community members in urban agriculture practices. This project included 20 families with approximately 4-6 people per family. Rodrigo and his fellow technicians began training the families in how to separate trash and to compost, they also built containers from tires and began an extensive container garden. The majority of people who participated in this program were women, with only 1 or 2 men. One of the goals of the project was to get people to separate trash and to see how much trash they produce everyday. In the beginning, they had limited success, Rodrigo commented

“One of the unintentional outcomes of this project was that we started to understand how the people function together in the unidad and how we function among them as outsiders. There were some people who did not get along with
other people because they had differing political agendas or beliefs. In the beginning everyone seemed very motivated, but after a bit of time there were disagreements. The director of the unidad, a very strong woman, began to work with us; she became the primary motivator for this project, she got the other residents motivated. At the beginning they were extremely motivated to finish the project and to make it successful. We learned however, that these projects can't be managed only by political figures and idealists, there has to be more organization and it there should be at least one person in the project who has the desire to see it succeed and has the technical training to train others and to make it successful”.

The project was in its infancy when I first saw it and it had a lot of promise. Six months later, while I was looking at community gardens with SEDERECC, I ran into Rodrigo working on a project in his own community. We had several chances to talk about the prior project and he agreed to an interview. I asked him how that project in the unidad in Coyoacan was functioning, he told me that it had completely disintegrated. He explained that when they began the project, they did not notice that there was a problem with squirrels. They planted the containers and then one night the squirrels came in and ate all the baby plants. This really affected the people emotionally because not only did they not see the fruit of their work, but they also didn't see anything growing and their morale was destroyed. Rodrigo went and got more funding to replant and to put in fencing and netting, however, the community did not want to do the project, they were no longer interested. He said,

“Historically in our country there has always been someone politically who wants to control the people, so now our people don’t believe in anything. We are external factors and didn't want to just go into the unidad and tell them what they should be doing, the people would just wonder who we think we are. We were outsiders in this community. The community went from being excited to learn about this stuff to suspicious and questioning our motives. The group of families broke down into just 4 families that decided to stay and work on the project. The director, the "very strong woman" that I mentioned earlier, turned against us and
broke down all of the harmony that we had worked together to create for the last 8 months. She decided this project was no longer important to her and she began to speak badly of us and of the project. This woman who had been a great motivator turned into our biggest naysayer. We realized that this project was lost. Everyone started blaming everyone else. The funders were blaming the ‘lazy' community, the community was blaming each other and the ‘untrustworthy’ outside technicians. It was a mess, a complete breakdown. A lot of it was ego”.

He reflected “Some things that might be good that have come from that failed project include an increased awareness of how much trash we each produce. They also now know how to grow plants, so if they decided to have a few containers in their home or their kitchen to grow, like a couple of tomatoes, they could do it, they have the knowledge. The human capital has been increased, that knowledge is theirs forever”.

The project Rodrigo was working on in his community was located in the delegación Magdalena Contreras, the delegación that Rodrigo grew up in. The urban agriculture project (I call it an “urban agriculture project”, instead of a garden because it was much more than just a community garden), was located in a multi-use open space, in the “only space of land that is still an open space in the colonia”. The project produces fruit, vegetables, herbs, roots and rabbits in 30 square meters. They also harvest rainwater and compost. It additionally functions as a meeting space for the community.

The land was donated by the community, for the community, with no political ties and was managed by a community organization. This project was funded by SEDERECC, and ran by Rodrigo and a partner who was also very involved in urban agriculture projects across the city. Rodrigo explained the goal of the project
“Our principle objectives are to reestablish agricultural practices in the community and to produce highly nutritious food and basic nutritional needs such as proteins, vitamins, minerals and amino acids. To create awareness within the community about where their food comes from. The true objective is to create a better quality of life for the community, my community, I live here. I believe that urban agriculture, even though it makes up a small percentage of the inhabitants of the City of Mexico, permits us to establish more productive social organization. I see urban agriculture as a pathway towards self-sufficiency”.

Rodrigo explained to me that all the immediately local community members participate in the project. He said that there are near 1,000 people in that specific colonia and they were predominately middle and low income, according to Rodrigo. He saw a broad spectrum of benefits to the community, some direct, some indirect. A direct benefit would include the fact that participants have access to more nutritional food. A more indirect benefit would be the increased community cohesiveness and organization as well as pride.

"Urban agriculture is not just about planting and harvesting, Urban agriculture, or working the earth, allows us as human beings to know ourselves. For example, with a community garden, you can get to know people in your community that you didn't even know were there.” Rodrigo continued, “A lot of funny things have happened to me since I have been in this project; for example I was in the garden earlier and a young girl walked by and asked what I was doing in the garden, then she told me that she was familiar with my family and lived in the community, but I had never met her before this. Also there was a man, who I still haven't met, but he was growing food in his own house and on his patio, and I know this because the police who come by the park all the time have told me. They are trying to make that connection. He has come by our project a number of times and told people who were there that he has some lettuce that he would like to share, we keep missing each other, I am sure we will meet soon. These examples are very simple, right? But there are studies that have shown that where no plants exist, people are stressed out. So plants, greenery, help to reduce stress and make people feel happier. Across from our garden is a police station, it has police from all over the delegación, in fact it is the delegación headquarters. Police are there 24/7, it is like a firehouse, and they have come and visited us at the garden, sometimes hanging out for most of the day. They have been harvesting from the garden and cooking with some of the herbs and spices. But
from a more psychological point of view, they are wrapped up in their problems with crime, but they can look across the street and see the vegetables growing, and they have repeatedly said it makes them feel more peaceful”.

Turkeys and Tianguis

This project was one of the first I visited with SEDERECC and the Cubans; I was unable to formally interview the matriarch of the family, Isabel, who was also the garden leader. This was a private garden project, funded by SEDERECC, and there were approximately 36 family members involved in the project. Isabel met us at the gate, she was a mature woman, probably in her mid sixties, with her hair tied back in a scarf. This neighborhood in Talhuac was a bit run down with structures mostly made from mismatched concrete blocks. The first thing I saw as we enter the gate into a courtyard was a giant turkey on a leash, apparently this turkey likes to escape. It eyed us suspiciously. Isabel gave us a tour of the garden; it was rather large with several raid beds in rows that were full of a variety of vegetables and herbs. It was very well maintained and she was rather proud of it.

Isabel also had a number of rabbits, the rabbits were being raised for food and she used their manure to fertilize the garden. Isabel explained to us that she was the one who applied for the SEDERECC program and that her sons helped her with the forms. She also told us that a SEDERECC technician came once a month to check on the project. Isabel was originally from the campo (farm, agricultural land) and that he used to help her father with crops. Her father grew nopales and corn. She also had family members who grew avocados, and various kinds of fruit. She and her husband moved to the city because they
saw it as a step up, and a chance for their children to have better lives, not vulnerable to the “ups and downs” (as she put it) of the agricultural lifestyle. I asked her if she thought it was ironic that she was now growing food again, and she laughed and agreed that it was; but she added that it makes sense, that it was really her life coming full circle. She mentioned that some of the city people (chilangos) view growing food as a step backward, like a step down, or below them. “That is farmer’s work”, they say in a disparaging manner to her. But Isabel said that it was honorable work, being able to support herself and her family by providing them with food. Isabel chatted with the Cubans for a while and then when I had another moment with her; I asked if she thought that she was saving money by having this little urban farm. She said that yes, she was definitely saving money. She said that they eat the rabbits for protein, that they were growing the turkey to eat as well, and that they get eggs from the hens (I didn’t see the hens, apparently they were at her daughter’s house). They also met the majority of their vegetable needs from the garden, they harvest lettuce, onions, tomatoes, cilantro, herbs, root vegetables, and more. Thanks to the climate in Mexico City she was able to plant and harvest year round. Isabel said that all they buy from the weekly tianguí and the market nowadays was packaged food, tortillas, bread, beef, fruit and the occasional vegetable.

**Fields of Gold**

This project was also located in the delegación Álver Obregon and was called “Fields of Gold”, it was located only a couple of miles from the Barranca San Borja project that I
originally visited when I first came to Mexico City. However, this project was in stark contrast to the success of the other. This project was not functioning at the time. We (the Cubans, a SEDERECE technician and I) met the two community leaders (sisters) at the garden site. My first impression was “Is this really a site?!” I didn’t see anything except a neglected hillside with piles of concrete blocks scattered around. We did not stay very long at this site, but long enough for me to ask a few questions. I asked the sisters what had happened here and they explained that there were two political candidates representing different political parties, the PRD and the PAN, (similar to the story I heard from Don Emilio at the Barranca San Borja project) and these two candidates were using this open space as a boost for their campaigns.

The one for the PAN wanted to turn it into a park with benches (I don’t understand this because it was located on a hillside and was rather small) and the candidate for the PRD supported ideas from the community to turn it into a community garden space. To make a long story short, the PRD candidate won the election and helped to initiate the project (through SEDERECE) with the community and these two sisters as leaders. The neighbors all got together and built raised brick beds and Chapingo brought in soil; gave workshops and the community planted a garden. The sisters told me that they had one harvest. One night the losing candidate showed up with some other men and they literally tore the garden apart. They tore the beds down and destroyed everything, it remained a collection of weeds and concrete blocks, debris from the raised beds. This was incredible to me, however, Dr. Ponce corroborated their story. I include this story as another example of
some of the constraints and challenges facing urban agriculture practitioners in Mexico City. Since that event there has been no interest in that space as a garden or a park and it was completely overgrown with weeds. The neighbors were discouraged, the community leaders were discouraged and nothing has been done to repair the site. They fear that if they do repair it, it will be destroyed again.

**Paola’s Fresh Start**

Paola struck me as a very strong woman. She was quiet, but when she speaks everyone listens. This garden was in very good condition and it was obvious that she really cares about it. Paola was a leader in this community and she has been elected numerous times to the board of the *unidad*. This garden has citrus trees (small ones, but still bearing fruit), and was established with a grant from SEDERECE in 2007. There were approximately 500 people living in the *unidad*, with 15 families participating in this project, approximately 100 people. The space that the garden was in was originally a dog park or dog walking area. The *unidad* voted and decided to turn it into a garden project, the vote was less than participatory with less than 20% of the *unidad’s* residents voting.

As previously mentioned, the garden was funded through a grant from SEDERECE. The way that Paola explains it, she saw a flyer at a community center in a different delegación approximately 20 miles away, and she called SEDERECE to find out the details. She then spoke with other community leaders in the *unidad* and they decided to apply for the
grant and to start the project. I asked her what caused her to be interested in this project, and she said that she had recently gone through a divorce (her husband left her with 5 children) and needed to supplement her income. Paola works cleaning houses, when work was available, and decided this might be a good way to bring pride to the community as well as increase food supply. “Now you can begin to see the contrast,” she said. “They come by and see the seeds have germinated and they’re amazed to see it’s a living thing because they’ve forgotten that food comes from nature”.

Paola said that originally there were more than 50 families who were interested and who helped set things up in the beginning, but many of them eventually dropped off. When I asked her to speculate on why they dropped off, she said that life gets busy. They need to work, or that perhaps they didn’t like the hard work, she also mentioned that some of them didn’t like working with “stinky compost”. She also told me that from what she knows there aren’t vecinos who were opposed to the garden. She said if there are, they haven’t said anything, nor has there been any vandalism or indication of their displeasure. I asked Paola if she feels that the project has been worth her time and she replies with an enthusiastic “YES”. She feels that this has increased community pride, she commented that,

“Even the people who do not participate will sometimes come by and trade a few moments of weeding for some limes, or they will tell other people that they live in the unidad with the “pretty garden”. When people pass by they see this beautiful, productive garden space. They see that they can indeed grow their own food, in a pot in the kitchen, in a small box, all over. They can do it and they can succeed. The only thing that bothers them was that there was a fence and it isn't always open. In that sense it was a little exclusive, but we have to have some security.
Sometimes when families pass by with their kids, they say, ‘Look kids, there are radishes there, there is cilantro and onions!’ The kids are exposed to urban gardening at an early age, they start to learn where food comes from.”

Paola also confirmed that she was spending less money on food than she was prior to starting the garden, she said she got more exercise and was in better health and she thinks this was the case for the participating families as well. She says that this project has made her more confident and happier. SEDEREC comes by about once a month to check on the project and to see if she has any questions.

Paola was well-trained by both Chapingo and SEDEREC from the beginning. This urban agriculture has been well-supported and was an example of the successes that can be had within communities who participate in community gardens.

Ximena: Revolutionary Soil

“It is a revolutionary act to provide for ourselves. So many of the people in this community are not self-sufficient, they are not able to find enough work, they cannot get ahead. The politicians are corrupt and they make it very difficult for the people to survive. Growing your own food gives us a chance to make it by ourselves, it gives us a chance to support ourselves, and it makes it easier on us if the food prices go up. Also, we mostly only buy meat, masa, oil, flour, sugar, coffee, those kind of staples now. The garden provides us with all the vegetables we can eat, so we have more money to spend on electricity and other necessities.”-Ximena

This was perhaps the most functional community-ran garden project that I visited, it was in the delegación Iztapalapa (one of the poorest delegaciones in Mexico City), it was situated in an open space that belongs to the unidad and it was flourishing. When we arrived we were greeted warmly, given a tour then taken into the community center
building (with posters of Che everywhere and communist quotes), chairs were set out and fresh veggies from the garden sprinkled with lime and salt were set out. A few moments into the interview and a man showed up with several larges beers and plastic cups. The atmosphere was very warm, informal and inviting. This was really the story of Ximena; this garden would not exist without her dedication and belief that it was possible to grow her own food and to turn her community on to the idea of growing food. The unidad was named Allepelalli and was built and was managed by the Frente Popular Francisco Villa (aka “Frente” or FPFV); Ximena was one of the local spokespeople for the Frente.

Through conversation I learned that she and her husband were responsible for the building of the Allepelalli unidad. They went to the government 25 years ago and applied for all of the permits and a loan to build the first level. Once that was completed she helped other families apply for the loan as well and now there were at least 5 buildings in the unidad with ten+ stories each, and many of the people who lived there, owned their particular unit, or were paying on it, with a few renting.

Ximena told me that she had heard about this urban gardening program that SEDERECE was promoting from a friend, and she went down to the offices to see what it was all about. When she arrived she was wary of the project itself; she has had many run-ins with egomaniac government officials in her day, and this was really no different. She got the paperwork she needed and then proceeded to fill it out with sharp precision. She spoke with other vecinos (neighbors) and took the pulse of the community: she wanted to be sure there would be some support for the project. Once she was convinced that there was
support, she held a community meeting with surprisingly high turnout. There was definite support for the project, with very little opposition; most concerns were about whether or not a compost pile would stink. Note: This community was mostly made up of Frente supporters and these people were generally politically aware, self-sufficient and wary of the government. They also trust Ximena implicitly, she has led them in the right direction for many years now. So Ximena, her husband and 2 other men (Vicente and Pablo) applied for the SEDERECE grant together, they received it. Vicente and Pablo were security guards, Ximena was the manager for the unidad, she goes to the delegación offices and she advocates for the unidad, everything from electricity to drainage. Unfortunately there was some argument in the beginning as to where the garden would go. I am somewhat unclear on the details, but apparently Nora from SEDERECE wanted it to go in an empty lot several blocks away, and Ximena wanted it to be a part of the unidad. Dr. Ponce from Chapingo intervened on Ximena’s behalf and the garden was started in an open space next to the unidad. This was back when Chapingo was still contracted with SEDERECE and was advising and training on all of the urban garden projects. There was definitely a difference of opinion as to how things should be done between Dr. Ponce and Nora.

This also caused some residual animosity from Nora towards this project in particular and she instructed the technicians who work below her not to actually support this project. So they supported it on paper, but were not available for support in any other way. When the

14 “Nora” was a high-level supervisor within SEDERECE.
time came for the technician to sign the paperwork for SEDERECE saying that the funds for the project were indeed used in/on the garden, the technician refused. This meant that Ximena was on the hook for the money, she was then indebted to the state. This kind of intentional roadblocking went on for some time before Dr. Ponce again intervened and Mercario (a technician from Chapingo) signed the paperwork, because they were still contracted with SEDERECE, his signature released Ximena. This project highlighted some of the difficulties when dealing with competing entities, all of whom are struggling for control and credit. Nora from SEDERECE was not available for an interview, I did try on numerous occasions to get her perspective, but was repeatedly denied.

This was one of the most complete projects that I saw. They have vermicomposting, composting, raised beds, rows, container planting, seed saving, water collection tanks, they even build a community center (a large room) and shed for the garden tools. Ximena and her group were harvesting year-round using techniques learned from Chapingo and the Cubans. Everything was organic, they use medicinal and herbal plants to keep pests at bay, and so far have had great success. I asked Ximena who participates, where the harvest goes and who was welcome in the garden. “First of all, everyone is welcome in this space”, she said “this is a safe place, and we are inclusive.” She then went on to explain that approximated 25 families participate in the garden activities. They helped sprout, plant, weed, trim and harvest. All of these families include children. Those who do not participate walk by and have conversations with people working in the garden, and most of the unidad has been in or used the new community center room at least once.
People will pass by and buy some cilantro or radishes or tomatoes, Ximena and the others sell it for only a few pesos each, and they often give vegetables away for free to the elderly residents who cannot help in the garden. The money that was raised goes into a fund for garden expenses such as seeds, soil and tools; she said that they don’t spend much on water because they catch and store rainwater, and it rains often enough in Mexico City. As I mentioned, this was one of the most complete, well-conceived urban agriculture projects in Mexico City. Even though it had a rocky beginning, SEDEREC now uses it as an example, a pet project. There was still some tension, but the project highlights successful SEDEREC urban agriculture programs, therefore SEDEREC generally lets it be.

Ximena’s plans for the future include training some local community members to be “teachers” or “guides” to educated school groups who occasionally come through. She would like to increase the number of children’s groups that come and visit and have someone there all the time to answer questions and to educate the community at large. When I asked her if there were any problems with vandalism, or any animosity towards them and/or the garden she gave me a strange look. “No.” she replied “None whatsoever”. Then one of the men who works with her (Pablo) explained that Ximena was very respected in this community and that it was unthinkable for people to vandalize this project because of her involvement in it. Ximena was very humble, but Pablo emphasizes that she was honored and respected in this community and that the people trust her. He said this over and over again, and the other man who works with them
(Vicente), agreed. They have tried to get teenagers interested, but the teens were not into this working in the dirt and stuff. Ximena said the key was to get them when they were
young, to plant that seed (pun intended) when they were little children and then when they are teenagers they will already have a love for gardening and will also be experts. When I asked Ximena why she wanted to do this she told me that she wanted this garden to be an example for the community, that indeed, they could do it. She was adamant that having a project like this increases their self-sufficiency and that they now have better access to food and are more resilient to rising food prices. She said that there was a problem in the local markets with a tomato harvest that suffered from some kind of pestilence, and the price of the good tomatoes went through the roof, but she had grown tomatoes, so she didn’t have to buy them at high prices, and she sold them to the community at very low prices. This was illustrated for me during our interview when an elderly woman stopped by and asked to buy some cilantro, Pablo got up, cut a large bunch for her, then charged her 4 pesos (about 30 cents), she then decided to buy some chard as well and the whole scene was repeated.

Ximena emphasized the fact that the community now has better access to food, and that the direct participants got sun and exercise working in the garden, as well as a sense of pride. “This is a poor community,” she said “we work hard and we get paid very little. Pride matters, we need to feel like we are worth something. This garden is one way for them to feel good, [for participants] to feel important in a small way. For me, my biggest challenge is to learn something new everyday, this is also a great benefit. It is a challenge, but we are here to demonstrate that ‘si se puede’. Here in Mexico, sometimes communal areas are not communal anymore, they become exclusive, either through subtle hints (that
one doesn't belong), or through overt action. We can have community space again. This space can serve to; 1) distract yourself or to enjoy the space for relaxation, 2) to grow food (to eat from the space), 3) community reconnection, to bring the community together and increase community cohesiveness. We can use these spaces in the city to grow food for the people who need it, who cannot afford it, and those who can afford it, well they can buy it a lot or a little, whatever it is that they can afford.” Ximena also mentioned that the idea has been spreading, leaders from other unidades come and look at the garden, and they think that indeed, they too can do this. Ximena et al. also planted a bunch of plants in boxes, 2 liter bottles, and other assorted containers that serve as an example to the community that they can have gardens anywhere, and in fact she said that many of the local residents have been growing small food on their patios instead of just decorative plants. Overall this is a perfect example of how an urban garden can transform or enhance a community. This unique and highly functioning garden has something that the failed projects were missing: unity.
Food Growing Systems and Methods in Mexico City

There is a wide variety of growing system methods being used in Mexico City, dependent on the location of the garden. On rooftops some urban farmers were using greenhouses with container gardens and greenhouses with hydroponics. In back yards and patios all types of growing systems were being utilized, including, but not limited to; raised beds, plots, row gardens and greenhouses. The most common type of growing system that I witnessed in my research were raised beds. These offered the most flexibility and versatility for the urban farmers. They also allowed for heightened usability as they are easy to build and access, can be built from many types of inexpensive materials, and are easier to weed than row gardens (one doesn’t have to bend down as far and can sit on the edge).

Practitioners of Urban Agriculture

The practitioners of urban agriculture are as varied as the growing systems. In my research, the vast majority of practitioners were low to middle income average citizens of Mexico City, with a few higher income folks thrown in. The important thing to note is that the motivations to participate in urban farming changes along with the income scale; this is something I will get into more thoroughly in my findings discussion. During my research I was able to interview 36 urban farmers, and I observed many more. It became obvious that many of the urban farmers were women, this included both the leaders and the participants. It became apparent that gender played an important role in the urban agriculture projects that I was observing.
Gender Aspects of Urban Agriculture

Most of the power players I observed in Mexico City’s urban agriculture landscape were women. The supervisors employed by SEDEREc were mostly women, though the technicians were all men. Of the forty projects that I visited, only three of the projects had sole male leadership, six additional projects had joint male/female leadership. Given the cultural landscape of Mexico City and the value that is placed on traditional gender roles, I found it to be interesting how many women were in power roles within the urban agriculture movement. I discussed this with several of the female leaders, and they all gave very similar reasons as to why this has happened. They brought up the point that women are responsible for procuring food and feeding their families, cooking and in some cases, they had been growing cilantro and oregano in their kitchens and patios prior to getting involved in the more formal urban agriculture “movement” in Mexico City. These positions differ from traditional gender roles when these women have several men that work under them, who respect them and actually answer to these women. However, the vast majority of the participants are also women, so there are very few men actually taking orders from women. One of the female supervisors that I interviewed told me that men are always in charge in the campo (the countryside), the men there are true farmers and are extremely macho. She had moved from the campo and said that she would never have been allowed to be in charge of fields, gardens or decisions there. She said (and this was echoed my several other female leaders) that she sometimes runs into this machismo attitude when buying seeds, asking for technical assistance, and selling produce. The
general consensus among the women was, though, that their lives had been greatly enriched, literally and figuratively, by their decision to lead and maintain urban agriculture projects in their respective neighborhoods. The supervisors in SEDEREc are an exception to this rule, as they have several men who work under them, they are also political appointees. I had very little opportunity to speak with, or observe the women who worked for SEDEREc; they worked in the office and were generally unavailable for interviews. I realized that urban agriculture is an extension of women feeding their families. It almost fits into that very traditional Mexican gender role of women as nourishers.

There are many reasons that people choose to participate in urban agriculture programs. For the majority of the participants that I observed and interviewed, the primary reason was economic. There are several secondary and tertiary reasons/benefits to participating in these programs, such as health benefits through exercise and time spent outdoors, community building, etc. The next chapter is a discussion of the challenges and opportunities associated with urban agriculture projects.
Chapter 5
Discussion

“The community is a bank of knowledge (un banco de conocimientos), empirical evidence, but we have to turn this knowledge into action. We have to make some type of connection with the knowledge and with science in order to reach a certain point. So in this country we continue and we're putting together these types of research, the little that we have to research we have to apply. Otherwise the result is that a lot of the research we do ends up in the libraries.” Dr. Pedro Ponce

Opportunities and Barriers to Urban Agriculture in Mexico City

There are many barriers to the success of urban agriculture projects in Mexico City. Some of these barriers can be applied across urban environments and some are unique to the culture and people of Mexico City. All of these challenges have solutions, some simple and other more difficult. In this chapter we will discuss the barriers to urban agriculture in Mexico City, we will also explore strategies to overcome these barriers and move on to opportunities. As I mentioned in the first chapter, I observed 48 projects and conducted 36 interviews. To be concise, I only highlighted 9 in this document, but when referencing the barriers and opportunities in this chapter, I am referencing the full 48 projects that I observed.

Challenge: Toxic Soil

The soil in urban environments can be extremely toxic, such as in the Barrancas San Borja project; this was especially true for many of the projects I researched in Mexico City. Some of the sites had previously been informal garbage dumping sites, others
simply empty lots where trash and random environmental pollutants had gathered (i.e. auto oil from local residents doing oil changes there, etc).

**Strategy 1: Phytoremediation and Soil Amendments**

Phytoremediation is the use of plants to remove contaminants from the environment. By harnessing the natural capabilities of plants we can remediate toxic soils, groundwater, surface water, and sediments. Instead of removing tons of toxic soil and filling the site with new clean soil, plants remove contaminants from the soil and store it within their plant tissue. In some cases, the plants themselves then have to be removed as hazardous waste, other plants break down the toxins and eliminate them altogether.\(^\text{15}\) In Mexico City, Chapingo and UNAM were in charge of testing the soil and organizing remediation efforts, specifically in the *Barancas San Borja* project.

**Table 5. Typical Plants for Photoremediation by Contaminant (Kaja Kühl, 2012)**

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Phytoremediation Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>As Arsenic</td>
<td>Chinese Brake Fern, Sunflower, Highland Bent Grass</td>
</tr>
<tr>
<td>Cr Chromium</td>
<td>Alpine Pennycress, Sunflower, Giant Duckweed</td>
</tr>
<tr>
<td>Pb Lead</td>
<td>Blue Sheep Fescue, Indian Mustard, Common Wheat, Common Ragweed</td>
</tr>
<tr>
<td>Hg Mercury</td>
<td>Indian Mustard, Seapink Thrift, Rapeseed Plant</td>
</tr>
<tr>
<td>PCB Polychiorinated Biphenyls</td>
<td>Paul’s Scarlet Rose, Zucchini</td>
</tr>
<tr>
<td>TCE Trichloroethlene</td>
<td>Willow Tree, Pine Tree, Eastern Cottonwood Tree</td>
</tr>
<tr>
<td>MTBE Methyl tertiary butyl ether</td>
<td>Willow Tree, Pine Tree</td>
</tr>
<tr>
<td>DDT Dichlorodiphenyltri-chloroethane</td>
<td>White Rot Fungus, Pumpkin</td>
</tr>
<tr>
<td>PCP Pentachloropheno</td>
<td>White Rot Fungas, Crested Wheatgrass</td>
</tr>
</tbody>
</table>

\(^\text{15}\) [http://toxics.usgs.gov/definitions/phytoremediation.html](http://toxics.usgs.gov/definitions/phytoremediation.html)
Strategy 2: Use Containers and Raised Beds

This was the most frequent mode of growing food that I encountered in Mexico City, utilized in Paola’s Fresh Start, Turkeys and Tianguis, Tierra Nueva, etc. Many of the areas that are available as growing spaces are on concrete, and also that as far as I could ascertain, SEDEREDE was not involved in phytoremediation efforts or education because Chapingo had ready access to the labs and testing equipment necessary. The projects I researched that were funded by SEDEREDE did not need phytoremediation because they were raised beds, container gardens and plots on the outskirts of the city in virgin ground. Phytoremediation was the domain of the University of Chapingo, therefore, when SEDEREDE and Chapingo ended their partnership, phytoremediation and soil remediation expertise went with Chapingo and SEDEREDE employed other methods to negate soil contamination. Some of the urban farmers and urban agriculture organizations do not have access to a laboratory or expertise to test the soil, so to be safe, they grow in containers and raised beds.

Challenge: Lack of Community Participation

This challenge is perhaps the most difficult to solve. Politics, power and participation are central elements in urban agriculture. Although there are lessons that can be learned from communities who have succeeded in engaging the community, the solution(s) are specific to the individual community. Historically, it is very difficult for outsiders to gain acceptance from disenfranchised communities. This is a universal theme, and it is made

16 See Appendix D for summaries of these stories.
more difficult if the outsiders differ in culture, gender or income than the community they
are trying to propose development in. Some of the concerns that community members
stated during my research were; 1) potentially unattractive, overgrown, neglected
gardens; 2) stink from the compost pile; 3) ignorance regarding pest control; 4) lack of
trust in the managers; 5) vandalism; and 6) tug-of-war over who is in control. Rodrigo,
the garden leader from Los Brujos gave me his perspective;

“The official UA program in DF began in 2007 with 20 projects, in 2008 there
were 30 projects, there should be more than 60 projects operating now [there were
around 45, some functioning, some not]. There are two problems that they are
having now; 1) they are not organized for production, there are many types of
(local) organizations, especially political, but none to support the production of
urban agriculture. The other problem is training, capacity building. They need a
lot of support and tech assistance apart from the processes of production, there
should be 1 technician for every 2 or 3 projects, and someone who is highly
trained that is a member of that community, that lives in that community. We
must build the capacity of the community so they can build their self-sufficiency.
If I were in charge of SEDEREc, I would actually train and hire community
members to be technicians and I would pay them for what they produce. Or I
would have technicians live in the community and I would pay them for what they
produce”.

Strategy 1: Asset-Based Community Approach

It is important for sponsors of the urban agriculture project to pinpoint the assets that
already exist in the community. The sponsors could develop a “capacity map” that
focuses on the skills and assets of the neighborhood and use it; instead of strictly using a
“needs map”17 that focuses on the deficiencies of a neighborhood. Questions such as
“Who is directing the process?” and “Who identified the ‘deficiencies’?” need to be

17 A “needs map” begins by focusing on a community’s needs, deficiencies and problems, is still
by far the most traveled, and commands the vast majority of our financial and human
resources. The alternative path, a “capacity map” very simply, leads toward the development of
policies and activities based on the capacities, skills and assets of lower income people and their
neighborhoods (Kretzmann, McKnight 1996).
asked and answered. Inviting the community to share what they want and how they want it, is a way to get them engaged and to build trust. Entering the community with the mindset that the garden is going to go there and that one is “helping” that community, can lead to distrust and resentment from the community members; perhaps they didn’t even want a garden. If one doesn’t ask, one will never know. The sponsors should identify the community leaders, organizers and neighborhood groups and approach these leaders in a respectful way that acknowledges their positions in the community and their cultural backgrounds (Kretzmann, McKnight 1996).

The majority of the community leaders that I interviewed had sought out this project through SEDERECON on their own. Many of them already had the support of their communities, some did not, and that greatly influenced the outcomes of their projects. The communities already have a wealth of connections, those connects should be identified and utilized. For example, perhaps a community member has a cousin who works in agriculture, perhaps they can be additional technical support. Or perhaps she is exceptionally good at community organizing, or knows where good soil can be found. The point is, there are strong resources within each of these communities that need to be recognized.

Strategy 2: Educational Support

Once community members and leaders have shown interest in a community garden, they must have educational support, although most of them had some agricultural knowledge. In my research, a majority of the participants had some kind of growing experience.
Some of them were raised in the campo, some grew flowers and other plants on their patios, and others had a spouse who was raised by farmers or farm workers. However, growing in an urban environment is vastly different from growing in the rural fields. There are things such as contaminated soil and land use permits that must be understood and mitigated. This educational support must be continued throughout the life of the project, with intensive training in the beginning, monthly check-ins after first planting and yearly check-ins after the project has been running successfully for a few years. These check-ins should be low-pressure and should be designed to provide support, not judgment.

**Strategy 3: Encourage Teaching in Primary Schools**

Engaging children is a nearly surefire way to engage adults. These children bring home the excitement of their learning and they spread it to anyone who will listen. This enthusiasm can be the catalyst for a parent to join a community garden, or to look into the possibility of starting one in their area. Each of the children I spoke with, at the few schools included in the research, told me that they wanted to grow food in their neighborhoods when they got home, and that their parents were interested in this possibility. If a child who was already growing tomatoes at school, started to pass a community garden on her way home everyday, there is a chance she would be interested in that garden, and would express that interest to her parents.
Challenge: Political and Procedural Roadblocks

In Mexico City, the citizens have strong political leanings and are very loyal to a candidate, once they support one. These place-based politics can cause strife when planning a community garden. In my research, I learned that in many of the same neighborhoods, even in the same *unidad*, the politics were divergent and incredibly alienating. It is not surprising that politics, power and participation are central elements in urban agriculture,

> “Indeed, citizen participation in agriculture and food-related organizations and associations is a cornerstone of civic agriculture. Through active engagement in the food system, civic agriculture has the potential to transform individuals from passive consumers into active food citizens” (Lyson, 2004 p77).

In some cases, the political differences were too deep to be overcome, and those garden projects disintegrated. This is made more difficult by the fact that clear governmental policies regarding community space and urban agriculture do not exist or are ignored. The political dimensions of healthy urban food production are critical to its success, and ignoring them would undermine long-term, sustainable, urban agriculture policies and practices.

**Strategy 1: Civic Engagement and Discussion**

Formal and informal forums for the communication and exchange of ideas should be established, or if they exist, identified. The knowledge and ideas of multiple, competing interests should be recognized. These forums would be safe spaces for civic engagement and deliberation. In some cases, the simple act of gardening and growing food together brings people of all backgrounds together for a common cause.
Strategy 2: Clear Governmental Policies and Procedures

In order to ensure lasting positive outcomes in top-down initiatives, the policies and procedures should be clear. These processes are part of larger, urban planning policies. The directive for more green space comes from the Distrito Federal (city-state) government, then each delegación can develop their own green space/urban agriculture plan, working with grassroots community organizations to identify where these projects would fit in. Finally, the individual colonias, also working with the community organizations, would develop and implement the details of the plan.

The existence of policies and procedures could discourage citizens from fighting about some of the mundane aspects of implementing a community garden, the policies should be written with substantial input from the local community, as that will give them legitimacy. This is important because people sometimes hold grudges over old arguments that can derail the entire project. It is critical to note that there are also drawbacks to having an overly rigid plan, as flexibility is important when working in the more informal neighborhoods; that is why each delegación and colonia must write their own policies and procedures.

Challenge: Lack of Framework to Measure Production

This was one of the issues that I observed repeatedly while researching projects in Mexico City. There were no methods in place to measure the amount of food produced. Most of the respondents’ answers regarding income and money spent on food were rough estimations. The technicians who were hired by SEDERECC were not trained to measure
output, nor did it seem that they were very concerned with metrics for measuring output.

Dr. Ponce and the team from Chapingo were just beginning to design a framework to rigorously measure the economic impact of urban agriculture on the lives of the participants. It was apparent that the emphasis was originally simply on training the participants and keeping the gardens functional. Once the gardens were functional (or, in some cases, had failed), the focus shifted to tracking what the gardens are producing and how much.

**Strategy 1: Institute Methods for Measuring Production**

This piece will require more education and support from the funding entities. Each entity could design a simple system to measure the output of the garden(s) they are sponsoring. That system can then be taught to the community/garden leader(s). The tools required would be a notepad, pen and scale with which to measure produce in kilos. For example, some of the urban farmers who have access to computers, could utilize a simple spreadsheet to track output, or even just a document that compiled the quarterly output of the garden. Knowing these numbers would make it much easier to determine the economic impact that the garden is having on the participants. These numbers would also be useful for the municipality to track and use in their reports on the city green projects and poverty alleviation projects. If the practitioners of urban agriculture are resistant to spending their time tracking outputs, perhaps the municipalities could take over that task, if that information is vital to the municipalities’ goals. For instance, the funding or technical support agency could give the garden leaders a pad of paper, pens and a scale. The garden leaders could weigh what they harvest and write it on the pad of paper. The
support agency could come by once a week or once a month and gather that data to be entered into a spreadsheet, or other tracking software.

Or, those outputs could potentially be directly tied to incentives. Perhaps the municipality, or those interested in the information, could offer monetary incentives for a year of tracking outputs. Or perhaps continued technical assistance could be linked to tracking output. Often, when applying for grants to further urban agriculture projects, the granters want hard numbers or at least a projection of what output could be, based on the numbers produced by previous harvests. Once the kilos produced are known, those numbers could be translated into the money saved or earned by participants. That knowledge could encourage more participation and could serve as a motivator to keep community members engaged.

**Strategy 2: Access to Market**

Of the projects that I researched, the vast majority were only interested in selling their overflow produce, however, there were a few others that produced solely to sell. Informal markets exist all over Mexico City and provide easy venues to sell their produce. Several of the community garden projects that I observed sell their excess produce at little pop-up farm stands. How the money produced is used was somewhat unclear. In some cases, the money went to whomever had done the work of harvesting and selling. In other cases, the money was meticulously tracked and put into a community garden fund that is used to maintain and support the garden. In most cases, SEDEREK provided the startup costs and support to these urban agriculture projects, but it was up to them to keep them going.
There were community garden projects and solo gardeners who expressed a desire to urban farm on a small-business scale and four solo growers (families) who already were. However, the interested parties that I interviewed had little to no business experience and did not know where to start. It would be very beneficial to connect the producers who wish to grow expressly for a market, to the buyers. In this case, the most lucrative buyers are gourmet restaurants and several high-end organic grocers. The “Greenhouse With a View” project that I observed was quite successful growing exclusively for a gourmet Italian restaurant. The chef had gone so far as to bring seeds from Italy for them to grow especially for him. That project is so successful, it is their sole income, and they were flourishing. That is one example of how urban agriculture can impact a family’s income status, and an example of the importance of connecting possible producers with consumers. Perhaps SEDERE C or Chapingo could connect potential boutique growers with buyers. SEDERE C already works in community economic development and they may be able to facilitate those connections.
CONCLUSION

Revisiting the Research Question

This thesis seeks to contribute to a growing body of literature filling in the gap on urban agriculture, specifically, urban agriculture in Mexico City. The main focus was on the origins and the establishments of community gardens and entrepreneurial urban agricultural projects and the assessment of their benefits, opportunities, challenges and impacts. Ultimately, this paper seeks to answer the question of whether or not urban agriculture programs can be used to increase food access and community development capacity in marginalized neighborhoods in Mexico City; also answering these questions; 1) What is the demographic, and socio-economic distribution of urban agriculture in Mexico City? The vast majority of the projects that I observed were in low income areas on Mexico City and the majority of participants were themselves low income, this is partially because I was observing projects that SEDERECC and Chapingo were directly involved in; high income, private growers would not be in need of funding. There were a few that I observed that were in high income areas of the city with high income participants. The participants in the high income areas told me that there were many other private urban agriculture projects in the high income areas of the city. To answer my original question; the urban agriculture in Mexico City includes residents from every sector of the socio-economic strata, the main difference between low and high income participants are the reasons that they garden. 2) What is the impact of urban agriculture on food security and nutritional status at the household and individual level? Figure 2 on page 4 explores the food security of the participants after participating in urban
agriculture projects. The self-reported findings are that there is a direct impact on how much food the participant is buying relative to how much food they are producing. Many of the interviewees described eating more nutritious foods, home produced meat and more vegetables, even vegetables that had once been strange to them. The functioning urban agriculture projects also had the multiplier effect of increasing the immediate community’s food security, even the non-participating members. In the example of Revolutionary Soil, Ximena speaks of selling tomatoes for a very cheap price to the local community members after a pestilence wiped out commercial tomato crops and the price of tomatoes went through the roof. Several of the community agriculture projects, including Revolutionary Soil and Barrancas San Borja regularly delivered free produce from the gardens to the elderly members of the community.

3) What are the impacts of urban agriculture on the environment and vice versa? I addressed this question a bit in my “Challenges and Opportunities” section. The impact of urban agriculture on the environment of the projects that I observed was largely very positive. Some of the projects, such as Rodrigo’s first project in Coyoacán, taught the participants about composting and how to reduce their garbage. Others, such as Barrancas San Borja cleaned up a huge dump that was hazardous to the watershed of Álvaro Obregon. Another project, Fields of Gold, was less positive, in the end all that was left were concrete blocks, I’m not sure that these were hazardous to the environment, but they were certainly an eyesore.
4) What are the impacts of urban agriculture on health? The participants that I interviewed had several things to say about the impact of the garden on their overall physical health, one from Paola’s Fresh Start remarked that she felt so much better and that she and her children were eating healthier food than they had been prior to participating in the garden, including vegetables that they previously never ate, such as kale. This was echoed in nearly every urban agriculture project that I observed where the main objective was production for participant consumption. I wasn’t expecting several of them to tell me that gardening had such a positive impact on their mental health, one man even referred to it as “therapy”, he described being depressed prior to getting involved in the project and said that participating “gave him hope”.

This study originally sought to answer whether or not urban agriculture could increase the food security and income of marginalized residents in Mexico City; however, in the cases of community gardens, this question evolved to focus on community development capacity instead of monetary income. Because these gardens were not measuring their outputs, there was little data on income generated by the participants, especially because income generation was not the main goal of these community garden projects, food security was. The urban agriculture projects that I studied had a direct impact on the community development and capacity of the communities in which they were located. The functioning projects served to organize the community members and many of them were trained in agronomy and went on to teach other members of their communities how to grow food, even if it was just a container of cilantro on their patio. Participants and
some community members who were not direct participants were also spending less money on food, freeing income for other purposes. This differs from the growers that I observed who were growing for the sole purpose of selling their produce. Those were individual families that were maintaining private projects and selling their goods for income.

It is evident from the research, that urban agriculture can be used to increase food access for its participants. But not without attention to some very important details, such as access to land, proper training, funding and supportive development and planning policies. The smaller, single-family entrepreneurial projects have less challenges; the income generated becomes the highest priority and there are fewer personal interests and egos to contend with. There are risks to urban agriculture being practiced informally, without the proper training. Without the proper training, it is possible for well-meaning practitioners of urban agriculture to actually do real damage. For example, the soil must be properly tested, or one could end up consuming high levels of toxic chemicals; or, perhaps one doesn’t understand how to properly keep a compost pile, this could result in a very stinky and unpleasant situation for their neighbors. Each compost pile that I witnessed was in good condition and did not stink, but Rodrigo did tell me that there have been several projects where the compost piles were not properly maintained, because of a lack of technical training, and the neighbors were unhappy with the smell. It is critical that the Mexico City government and the other sanctioning organizations provide support and ongoing training to these projects.
The Role of Planners

Planners have an important part to play in encouraging (or discouraging) urban agriculture development. Planners could recognize urban agriculture as a technical land use activity and ensure that land was set aside for food growing in Land Use Plans. They could designate public space in parklands for the purpose of producing food, and require new developments to include gardening space in their plans. The discussion of power and participation has been taking place in the planning community for decades. Urban agriculture is profoundly political and touches on ownership, access, health, poverty and urban development; all topics that a community organizer is well-versed in. Community and regional planning is a discipline that cuts across many others, such a public health, industrial development, community organizing, etc. This gives the planner an advantage when trying to bring stakeholders from various other professions and communities to the table. Multi-stakeholder processes can help to increase the quality of decision-making by creating a better understanding about the priorities of those involved in the process. It can also improve the likelihood of implementing urban agriculture and create a more credible process (Mougeot, 2000).

Further Research

There is a need for further research into the long term sustainability of these urban agriculture projects. The ones researched for this thesis were still in their infancy, with only a few in production for more than three years. It is generally easy to get community members involved in a new project, when there is great excitement; but keeping them
involved is the more difficult task. The entrepreneurial projects are likely to stay in production, if the business practicing are sound and there is still a demand for the food being produced. As mentioned in challenges and strategies; there is a need for a simply system of measuring the output of each harvest, so a more concrete picture can be painted as to the economic impact of the project.

As food prices across the globe continue to rise, and there is a heightened interest in climate change; more people are jumping into the practice of urban agriculture. Researchers are developing technologies that make it easier and more practical to grow a portion of one’s own food in a tiny indoor space or patio; information is being widely shared and taught; chickens and rabbits are being zoned for and cultivated. While it is unlikely that the complete survival of a family would depend on a patio garden; the food produced could certainly offset the rising cost of food, thereby increasing the financial standing of the grower. Volunteer organizations and food policy councils are thriving as it has become very trendy to be concerned with where one’s food comes from. These organizations have the potential to change the way residents of their cities engage with, and access, food; a kind of “civic agriculture”. The concept of “civic agriculture” (countering the industrializing trend of agriculture through local food production in the United States) is tied to community social and economic development (Lyson 2004, p.1). Politics, power and participation are also central elements in civic agriculture, which “… flourishes in a democratic environment. Indeed, citizen participation in agriculture and food-related organizations and associations is a
cornerstone of civic agriculture. Through active engagement in the food system, urban agriculture has the potential to transform individuals from passive consumers into active food citizens”.
APPENDIX A. DEFINITIONS

Definitions

For continuity’s sake, definitions are provided below for the terminology used within this paper.

Universidad Autónoma de Chapingo (referred to as “Chapingo”)

The oldest and most well known agricultural university in Mexico, a professor at this university, Dr. Pedro Ponce has been leading the majority of urban agricultural projects in Mexico City. His department is responsible for the technical training of all but 4 of the community garden leaders that I interviewed.

SEDEREC

Secretaría de Desarrollo Rural y Equidad Para Las Comunidades (Secretary of Rural Development and Equality for Communities). This is a multi-departamental government institution that is charged with many different rural, urban and social justice tasks. One of these tasks is to fund and train urban agriculture projects in the city, with an emphasis on projects in marginalized areas of Mexico City. They only fund organic projects and are careful to check up on ongoing projects to ensure they are organic and are producing.

Mexico City

The physical area contained within the 16 boroughs of Mexico City, both urban and peri-urban.

Urban Food System
The series of interconnected activities that shape how food is produced, processed, distributed, consumed and recycled within the city. The urban food system is tightly linked to the regional food system (City of Victoria, 2010).

**Food Security**

When food is available at all times; that all persons have means of access to it; that it is nutritionally adequate in terms of quantity, quality, and variety; and that it is acceptable within the given culture. Only when all these conditions are in place can a population be considered “food secure” (FAO, 1996).

**Community Garden**

A garden that is located in a publicly available space, lead by, tended to and harvested by the immediate community. This can also include a piece of land in a neighborhood that has been sectioned into plots and community members tend the individual plots individually.

**Food Systems Planning**

The integration of food system issues into policies, plans, and programming at all levels of government (DVRDC, 2010).

**Urban Planning**

The design and organization of urban space and activities and determining and drawing up plans for the future physical arrangement and condition of a community (Princeton University, 2011).
APPENDIX B. SAMPLE INTERVIEW QUESTIONS

What are your responsibilities?

Is your position (x paid) (x unpaid?)

Is your position (x part-time) (x full-time?)

What is your definition of Urban Agriculture? (what does it include/exclude?)

Why are you interested in Urban Agriculture?

How long have you been working in UA?

What is your definition of Food Security (hunger, food sovereignty)?

Is there a connection between UA and Food Security?

What are the potential neighborhood and citywide benefits of UA? (ecologically, socially, economically)

What are the potential neighborhood and citywide risks of UA? (ecologically, socially, economically)

What is the program you work for/are involved with?

How long has this program been in existence?

Will it continue once (if) the political party has changed?

Who owns the land on which your garden is located?

Do the communities eventually take complete ownership over these gardens?

What is the mission of this program?

How are the target communities identified?

How is this program funded?
Are the communities in this program hungry? How do they get their food?

Has this program increased access to food in the target community? How?

Has this program had any other unanticipated benefits in the target community?

Unanticipated problems in the target community?

What are the goals of this project?

How are the crops that will be planted in the target communities determined?

How are the recipients of the harvest determined?

Is there ever more interest than garden space?

Is there ever a waiting list? If yes, how long is the list?

Are there any rules to participate in the garden? If yes, what are they and how are they enforced?

Is security necessary at these gardens? If so, how is it done?

Are you purchasing more or less food since participating in the garden?

By how much (percentage)?

Approximately what percentage of ____ men and ____ women are in your garden?

Of your total garden approximately what percent of each age group participates in your garden?

Children (1-12) ____% Youth (13-25) ____% Adults (26-45) ____% Mature Adults (45 +) ____% Don't Know ____

Of your total garden what percentage of people fall into these income levels?

Low ____ % Middle ____% High ____% Don't Know ____
Why do you believe people participate in this garden (be it social, economic, environmental, political and/or other)? Please elaborate as much as possible.

What effect, if any, do you believe that your garden has on your community (be it social, economic, environmental, political and/or other)?

Do you object to your name being in my Thesis? Yes___ No___

Do you object to being quoted from the survey document in my Thesis?

Yes___ No___

Could I call you for a possible discussion regarding a follow-up interview regarding this survey? Yes____ No____
APPENDIX C. Historical Agrarian Reform and Agricultural Policy in Mexico

The implementation of agrarian reform programs has been one of the most important policy tools Mexico has used to shape its agricultural landscape. The need for land has been a driving force in shaping politics and rural policy in Mexico, after all “Land and Liberty” was the slogan for the rural poor who fought in the Mexican Revolution because land was a way to make a living, to survive. Policy is difficult to implement in a specific way, oftentimes it is difficult to even narrow down and finally reach agreement on. Policy makers, business leaders, community leaders, and citizens often have a very differing idea of what the policy should be and how it should be implemented. Agrarian reform policy is no different. It wasn’t until fifteen years after the Mexican Revolution that the presidency of Lázaro Cardenas, the principal architect of Mexico's modern state and its long-ruling Institutional Revolutionary Party (PRI), put land reform into effect (DeWalt 1991). The *ejido* system was introduced as an important component of the land reform program. In order to establish an *ejido*, landless farmers who leased lands from wealthy landlords would petition the federal government for the creation of an *ejido* in their general area; then the federal government would consult with the landlord and if the government approved, the land would be redistributed from the landlords, an *ejido* would be established and the original petitioners would be designated as *ejidatarios* with certain cultivation rights. *Ejidatarios* did not actually own the land, the government retained ownership of the land, but were allowed to use their allotted parcels indefinitely as long as they did not fail to use the land for more than two years. They could even pass their rights on to their children (Haenn 2006). Mexico adopted a model of import substitution
industrialization, which protected and promoted the development of national industries.

By 1940, at least 51% of the value of agricultural production was being produced on the 47% of land held by *ejidatarios* (de Janvry 1981, quoted in De Walt, 1991). This transition to *ejidos* led Mexico into a unimodal strategy, which emphasized the growth of small, productive peasant agriculture and reduced traditional bias in favor of large landowner agriculture. The Mexican government’s regulation and direct intervention in the food production system increased continuously from the 1930s up to the debt crisis of 1982.

In the years following WWII, the Rockefeller Foundation sponsored a large agricultural project aimed at modernizing Mexican agricultural practices, particularly to increase yields of wheat and corn, the two most important food crops in Mexico. This program was extremely successful with regard to wheat, and became known as the Green Revolution with wheat yields quadrupling from the late 1940s to the 1980s (De Walt 1987). This increased productivity from the seeds of the Green Revolution could only be obtained using vastly irrigated fields, and this requirement automatically biased the program towards large landowners. The Mexican government heavily subsidized loans to these landowners for machines, fertilizer and pesticides, and irrigation water. Irrigation was very important regarding Mexican technological agricultural progression. Irrigation allowed previously infertile lands and desert lands to be cultivated, especially in the desert north of Mexico. Esteva wrote about the Mexican government’s agricultural
modernization model and its effect on agricultural production, favoring highly productive large landowners.

Thus, things were arranged for the development of commercial agriculture. Commercial agriculture enjoyed the double incentive of low labor costs and high support process. It also enjoyed cheap credit, modern subsidized inputs, support for mechanization, reasonably efficient technical assistance and the advances of research (Esteva, 1987)

These sets of inputs and subsidies paved the way for further land reform, this time using a multimodal strategy away from the small ejidos and back to large landowners.

The theory of comparative advantage was (and still is) a driving force in the Mexican agricultural system. For much of the 1960s through the 1970s the Mexican agricultural sector was a very important earner of foreign exchange, because Mexico had a climatic advantage, and low wage rates, agriculture constituted about 70% of Mexico’s exports mostly as high value fruits and vegetables (De Walt 1991). In 1984 as livestock production continued to grow, large commercial landowners lost interest in growing staples and small farmers were have difficulty making ends meet through farming. Most small farmers were still growing staples such as corn and beans because they had not received subsidies and technical assistance from the government to facilitate their switch to anything else. Billie and Kathleen De Walt explored the affect of the comparative advantage theory on Mexican agricultural trade stating that:

Output of livestock products and high value crops for domestic and export markets has grown, but this benefits only those who can afford to purchase such products. In the same way the doctrine of comparative advantage has not been kind to Mexico. The country produces many crops for which it
has a climatic and/or wage comparative advantage, and it increasingly imports wheat, maize and sorghum at the relatively low prices prevailing on the world market. However, as de Janvry has noted in his review of Latin American Agriculture: “Agricultural exports and food dependency, while good for the balance of payments and capital accumulation, have a regressive effect on the distribution of consumption, for food imports are biased towards high-income consumers and hardly reach the more remote areas” (1981) In the Mexican case, the situation is no longer good for even the balance of payments (De Walt, 1991).

As the De Walts pointed out; these agricultural policies of land reform, modern technological advancements and comparative advantage might work, and often do in other countries, but under the various conditions in Mexico have demonstrated how they do not always produce the results that are expected.

Mexican’s access to food changed dramatically as the already existing hunger problems became even worse during the post 1982 economic crisis, effecting a wider variety of people. Many peasants who formerly had access to land through ejido programs no longer had that land and were not able to grow food for their families. They began to immigrate to the large cities, and those who stayed behind struggled greatly. The government was beginning to recognize that there was a humanitarian crisis in rural areas. Most urban consumers already had access to generalized government food subsidies in the cities. The Mexican government relied on these populist strategies of generalized subsidies to buffer political conflict and to keep together ruling coalitions, especially in Mexico City. This also benefited industry because if urban food prices were kept somewhat low, manufacturers were able to keep wages equally low.
In 1965, the Compañía Nacional de Subsistencias Populares, (National Company for Popular Subsistence, CONASUPO) was created to organize all of the government’s food regulatory activities into a single enterprise. According to Antonio Yunez-Naude (2003), CONASUPO was defined as an instrument to promote Mexico’s economic and social development by:

a) Regulating the markets of staples (or popular subsistence crops) through the creation of more efficient and rational relationship between producer and consumer and the elimination of inefficient and dishonest intermediaries, and b) protecting low-income consumers, by granting them access to basic foods, and low-income producers, by allowing them to obtain a livelihood from their production activities. In other words, the objectives of CONASUPO were to increase both the purchasing power of low income consumers and the income of small, staple-producing farmers, while simultaneously promoting domestic and external trade in these commodities (Yunez-Naude, 2003).

The government encouraged the production of corn and beans through CONASUPO by maintaining support prices and controlling imports up until the 1990s. With trade liberalization, however, CONASUPO was gradually dismantled. Under the pressure of the International Monetary Fund (IMF) and US banks, the Mexican president Miguel de la Madrid began the dismantling of the Mexican welfare state. CECONCA, the farmer education extension, was closed down in 1985. TRICONSA, the rural development organization, closed down in 1987. MINSA, the corn processor, was dissolved in 1995; DICONSA, the distributor, shut down in 1995 (Yunez-Naude, 2003). At the center of this dismantling of the welfare state were the Constitutional changes in the ejido. In November 1991 president Carlos Salinas de Gortari, reversing his position, began to call for changes that privatized ejido lands. The Mexican Congress adopted his proposed
changes in February 1992 in Constitutional amendments to Article 27 permitting the sale and rental of *ejidos* lands. The modifications in Article 27, permitting the privatization of the *ejido*, were passed in order to conform to the new North American Free Trade Agreement (NAFTA). This change in the Constitution represented a qualitative change in Mexico's entire political, economic and social system (La Botz, 1998). In the late 1980 and 1990s the president's brother Raul Salinas and other Mexican politicians became involved in a number of fraudulent schemes involving CONASUPO. This corruption helped to discredit CONASUPO further and became another argument for privatization.

After the dismantling of CONASUPO, two new mechanisms were implemented: Alianza and PROCAMPO\textsuperscript{18}. Alianza provides income payments and incentives for mechanization and advanced irrigation systems. PROCAMPO is a conditional cash transfer program for farmers and was originally designed to compensate staple producers who were expected to face declining prices after the initiation of the North American Free Trade Agreement (NAFTA) for 15 years, and was meant as a gentle transition to the free trade era. The program provided cash transfers specifically to agricultural producers who had land dedicated to staple production in the period prior to NAFTA. This support program provides 3.5 million farmers who produce basic commodities (mostly corn), and which represent 64% of all farmers, with a fixed income transfer payment per unit of area of cropland. This subsidy increased substantially during president Fox's administration,

\textsuperscript{18} PROCAMPO was replaced with PROAGRO Productivo in January, 2014.
mainly to white corn producers in order to reduce the amount of imports from the United States (La Botz, 1998).

As one of the main instruments of Mexican agricultural policy today, PROCAMPO sought to improve the wellbeing of farmers by increasing and stabilizing their income. By providing cash, PROCAMPO helped credit-constrained farmers invest in agricultural production and obtain higher returns on production. In this way, each peso transferred to a farmer may increase income by more than that peso creating a multiplier effect.

Mauricio Merino, a researcher with the Centro de Investigacion y Docencia Economicas (CIDE) a think tank in Mexico City, conducted a large investigation into the effects of Procampo on the average campesinos (farmers) in Mexico. He had this to say about the impacts of Procampo:

But the undeniable thing is that Procampo hasn't produced greater equality; it hasn't helped the poorest campesinos out of their condition of offensive marginalization; nor has it served to guaranteed greater competitiveness between the biggest farmers in and the wealthiest and better equipped farmers of the United States; and it hasn't reinforced the capacity of rural Mexico, for its part, to increase and distribute income. Which indicates that it is impossible to say that Procampo has been a successful program. It's not correct and it would be unjust, even undignified, to not correct the errant path. Otherwise, instead of producing food we will continue, as always, producing misery (Marino 2009).

**Trade and Its Consequences**

It is impossible to talk about agriculture in Mexico without including foreign trade agreements, the most influential of which is NAFTA. To prepare for trade with the USA and Canada, Mexico was required to make a series of dramatic changes. Not the least of these changes was to its Constitution; under intense pressure from the World Bank and
the United States, Mexico rewrote Article 27 of its Constitution eliminating the ejido system of collective land ownership. The *ejido* system had been a cornerstone of indigenous and peasant rights in the Mexican agricultural system and an important outcome of the Mexican Revolution of 1910. In the opinion of many Mexicans and even some economists, eliminating *ejido* protections and privatizing traditional lands further marginalized already vulnerable populations.

When NAFTA opened trade between the USA, Canada and Mexico many American and Canadian manufacturing companies saw an opportunity to move their manufacturing plants to the northern border of Mexico. This move greatly reduced the labor costs of these American and Canadian companies. One influential thing that NAFTA did right away was to eliminate a large number of tariffs on goods shipped between the three countries. Previous to NAFTA, American goods that were being sold to Canada and Mexico carried with them a high tariff. As a result of NAFTA, Mexico has purchased goods from the US in much greater numbers than before. This saves Mexican companies money on imports, and it saves American companies money on export shipping costs and is touted as great for everyone’s economies. However, according to Joseph Stiglitz (2004) while Mexico benefited in the beginning, especially with exports from factories near the United States border, because of the steady weakening of the American economy and intense competition from China, those benefit have been greatly reduced. He points out that Mexico has a low tax base, low investment in education and technology, and high income inequality, all of which work together against Mexico when compared to a
rapidly growing China. While wealthy multinational manufacturing corporations continue to benefit from no tariffs, poor Mexican corn farmers face an uphill battle competing with highly subsidized American corn. And as all but one of Mexico's major banks have been sold to foreign banks, local small businesses are having difficulty accessing credit.

As one looks further and further into the agricultural impacts of NAFTA the research points to an overall negative impact on the small farmers, the diminishing middle class and the poor of Mexico. Perhaps lesser recognized is the impact of the exportation/importation of culture. NAFTA has resulted in a vast influx of American consumerism. NAFTA has had a profound impact not only on the economy of Mexico, but also on the culture and landscape of food production, and it can be argued that it has a part to play in the current obesity and diabetes epidemic that Mexico is experiencing.
“Very soon, in the upcoming years, we will have a very big problem with food. The prices will raise and there will be shortages. This city is growing. It is very important to teach the children. It is very important to familiarize the children with the earth the water and to teach them to have a relationship with food. They need to know the cost and what goes into growing food, it's not just that you run down to the supermarket and buy food there, the cost is much more than that. This raises the people's access to food, they can have it right there in their house in a container. Or in the gardens.”

-“Rose” School Garden Educator

This was the first school garden I visited, and the only one that I saw that was at a boarding school. The school was a place where children were sent when their parents either work far away (out of the country), or when the parents work all week and then return on the weekends. It was for low to middle income families. The school looks like any other school, classrooms and dorm-style concrete buildings. There was a large playground and a courtyard with basketball hoops. We were met by a group of teachers and administrators who greet us and begin to show us the gardens. There were raised beds in several parts of the schoolyard area. At least 17, maybe more, long rectangular beds. In one of the sections, there was a class currently taking place, “Biology” we were told. The kids were planting seedlings and having a grand old time playing in the dirt.

The kids in that particular class were ages 7-8. There were huge compost piles contained in large wooden boxes twice the size of apartment dumpsters. All of the compostable scraps left over from meals were put in these compost piles. A little girl, maybe 9 years old approached me, “Are you from the US?” she asked me in Spanish. “Yes, I am, I’m from Colorado, I replied.” She squealed with delight and asked me what it was like there.
I told her we have mountains and rivers, and then I asked her if she liked the gardens, she said yes, it’s fun to play in them, but the compost was stinky and the worms were slimy. She and her classmates were astonished that something like farming was important enough to warrant a visitor from the U.S. This was considered low level work. The young lady told me the first cherry tomato she’d ever eaten, she helped grow, and now she loves them. She was genuinely impressed that the seedling grew into a plant and that it grew cherry tomatoes, she really went on and on about those tomatoes. One of the teachers said: "We have noticed a definite difference in the kid's attitude to food. Now during lunch they will ask for vegetables, they will go to the garden and pick a few to eat with lunch. Before the gardens we could never get them to eat vegetables, plus raw vegetables are not always a traditional part of our (mexican) food. It isn't like they are normally sitting down to a salad at home with their families. However, I believe that they are more likely to ask their parents for the same kind of food they see in the garden"

These gardens were in great condition, there was also a full-time gardener who works for the school and does some of the garden maintenance. We were given the “tour” and then escorted into a room where we were given a slideshow of the project from start to present. I did not have time to interview any of the teachers or the leaders, so the only data was informally from the little girl and my own observation. This project was obviously functioning well and it was funded by SEDERE, a technician checked on it every month as per SEDERE regulations. The administrators worked the development and maintenance of the gardens into the curriculum and have the janitor/gardener take care of some of the maintenance and this increased its success rate. They also were very
proud of the project and they have the will to continue it and have not experienced any political opposition. This was important because the school receives funds from the delegación.

**Growing Soil**

This project was unlike most of the others I visited because it was founded by a small group of young, educated, affluent women in Mexico City. Environmentally conscious with a passion for creating green space and educating people, these women started their garden with funding from SEDERECC and a passion to grow more soil. They had an emphasis on more soil, less concrete. One of the organization’s leaders explained to me that, “Our garden mantra has become 'transforming ‘waste’ into fertile soil, clean food, and family incomes’. We are rethinking the life cycle of materials and applying the ‘waste equals food’ parallel to regenerate soil, feed ourselves, and create sustainable markets from 12,000 tons of waste”. These women formed an organization that was still functioning and excelling in Mexico City. They turned it into a business. They installed gardens (patio, raised beds, hydroponics) for wealthy Mexico City urbanites and they teach classes on urban gardening that were open to anyone, if you could pay. They had various volunteer opportunities or apprenticeships, but these were generally filled by people who could afford to not work. They have a low cost intro class and if one wanted to delve deeper into urban gardening techniques, the cost escalated to a level well out of the reach of the low income residents. They had several functioning container gardens in the center of Mexico City, in affluent neighborhoods. Their first and main garden space
was located in a large patio with a small attached building. They grew an impressive array of food and flowers in this space and also did vermicomposting. Passersby could admire the space and it gave inspiration to people interested in growing food.

**Greenhouse With a View**

This is the story of a family in Mexico City who’s mother was out of work was looking specifically for a way to supplement her income. She and her husband had both recently been laid off and they were worried about how they would support their two young daughters and mother in law. Regina, (the mother) saw a spot on the television about an urban agriculture project in the city center, and on the program they explained that SEDEREÇ was funding these types of projects and that all were encouraged to apply. So Regina talked it over with her husband and together they did some research as to what would be profitable for their family, and they applied. Based on information they received from Chapingo and UNAM; they decided to built a greenhouse on the roof of their unidad building (they lived in a smaller building within the unidad, with only 2 stories, they had the top level), and using a design learned from a UNAM graduate student, Regina and her family built a hydroponics production greenhouse on the roof. There they decided to grow boutique lettuces for a few local high-end restaurants and cherry tomatoes. First they applied for funding through SEDEREÇ, and they were given funding. Next, Dr. Ponce and technicians from Chapingo taught the family basic

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19 Universidad Nacional Autónoma de México (National Autonomous University of Mexico)

20 A hydroponics greenhouse design using pvc pipes.
gardening techniques and gave them reading materials and workshops. Both Regina and her husband took free workshops on design and agronomy at UNAM when those workshops were available. They then began production. When I visited this family (about a year and half into production) I was very impressed with their operation; they were producing a good amount of lettuces and were regularly supplying four restaurants as well as an organic grocery store in a wealthy neighborhood. They were growing arugula, butter leaf lettuce, a red-leaf from Italy that I don’t know the name of, cherry tomatoes and baby romaine. The owner of one of the restaurants had actually brought the seeds of the Italian lettuce from Italy and given them to Regina to grow this lettuce exclusively for them. When they decided to start this project, Regina and her husband were both out of work; at the time I visited them Regina’s husband had found a job working for the delegación, but they were still supplementing their income with their lettuce production.

**Urban Rabbits**

I was able to talk to Tina, an urban farmer who raises rabbits and promotes raising rabbits for food consumption in Mexico City. She mostly works with the poor of the city who were looking to supplement their incomes by raising some of their food. Tina was an educator; she started as a farmer, raising rabbits and has now been teaching other people of Mexico City how to raise rabbits to augment their income and food supply. Tinadrdud explained to me that the domestic rabbit was a source of animal protein for the ancestral inhabitants of the area and that raising rabbits was highly successful because of their high productivity and ease in raising, which makes it suitable for the conditions of family
dwellings. This project follows the pattern that had become apparent in my research; that women were the primary practitioners in the production of food (in this case, rabbits). The objective of raising rabbits was to contribute to the family economy, directly contributing to income and complementing other activities. She said, “In our diet, the diet of Mexicans, we eat more than just vegetables, we eat at least 30% animal protein and it is traditional. Also, growing animals greatly increases our savings. If we don't have to buy animal meat we can save a lot of money. With 30 kilos of rabbit food you can feed 2 families of 8 rabbits each, feed your family and generate a profit as well. Unprocessed a kilo of rabbit will go for 70 pesos, but butchered a kilo will go for 300 pesos. We have limited space, we can produce these animals in very limited space, 2 families of rabbits in a square meter”. These projects were funded by the local delegaciones, not by SEDEREC. Tina said; "It is important to get protein to the people. Growing vegetables and fruit is a good thing, but if a family really wants to save money, they should raise some rabbits and chickens." Tina also mentioned that "The processes (growing veggies and raising animals) complement each other, they are part of the circle of life, the animal manure nourishes the plants and the plants nourish the animals". Tina’s program was highly functional, she mentioned not having to buy any meat, unless her family wants something special (like beef), she and her family enjoy very high food security and subsist on the rabbits and chickens they raise.

**Contested Space**

This was another garden that was sponsored by SEDEREC; actually, all of the gardens I looked at were funded by SEDEREC with technical support from Chapingo, with the
exception of the Urban Rabbits and the *Barrancas (San Borja)*. Also, the majority of the projects that I saw were in impoverished neighborhoods made up of government subsidized housing called *unidades* and this was no exception. This particular *unidad* was in Ixtapalapa, and it took me about an hour by metro to get there (from near the center of the city). I met the SEDERECA technician at the train station and we walked several blocks to the project itself. The woman who met us there, Mari, was an elected leader in the *unidad*; she was also the garden leader and told the story of how the garden came to be. The buildings of the *unidad* were very large, several stories, maybe 7 or more (it varies), and there were strips of open space in between each *unidad*. This strip of open space was often used as a recreational area for the residents of each building, especially the people who live on the first floor. They used to sit on their patios and let the children play in the grass, or hang their clothes out to dry in this space, among other activities.

Mari told us that she heard SEDERECA was funding projects like this across the city, she talked it over with some of the other elected leaders in the *unidad*; together they decided to apply for the SEDERECA funding. They received funding and they succeeded in getting a high number of the local residents to come together and build the raised beds. There were several (approximately 12) beds in these open space “strips” in between the *unidades*, and they were very overgrown. This was yet another case of runaway chard.

The only things growing in these beds were chard and weeds, sprinkled with plenty of trash. Mari explained that the garden was in this state because the community had lost
interest. There was a lot of enthusiasm for the project in the beginning, but people began to drop off, also, after the last election, some people no longer wanted to be involved in the project for political reasons. Mari did not speculate as to why people stopped participating, simply replying that things got “complicated”. I later learned that there was a lot of political posturing that happened in that community, although the details remain unclear. Noting all of the trash around, I asked her if they had any problems with security or with vandalism; she replied that they did have problems with those things. There were some vecinos who were very unhappy with the gardens. This was space that they had once used and now they could not use that space because it was under cultivation and fenced. To them, this space had been robbed from them with no obvious benefits to them. I asked her if these vecinos had been invited to participate and she replied that all of them were welcome to participate, but that many of them were busy, or uninterested, etc. This project was an example of some of the constraints that urban agriculture projects face in the city. In this case, loss of interest and political disagreements were the challenges that led to the end of the project.
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