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Inch by Inch: Expanding the Community Garden Programs in New York City

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Inch by Inch: 
Expanding the Community Garden Programs in New York City

Michael Bailey
Fordham University, Rose Hill
Environmental Studies Thesis
Abstract

The importance of community gardens in New York City is twofold: first as a portal to a real natural aesthetic in an otherwise brick and concrete urban jungle, and second as a sustainable alternative to agribusinesses that are dominant in the contemporary private sector. This paper addresses the issue of the diminishing community garden support in NYC, especially in middle and lower-income areas. The introduction is a personal anecdote about the poor quality of New York City Housing Authority (NYCHA) gardens, and the work being done behind the scenes to improve them. Chapter one provides data showing the scope and cost of the community garden programs in NYC. Chapter two discusses the history of agriculture in NYC and the greater New York area, and gives background to the current agricultural and gardening programs in NYC. Chapter three discusses the various advantages resulting from community gardens, including both physical and mental health benefits, as well as the economic benefits of community gardening. Chapter four examines the politics of the gardens through the case study of NYHCA’s declining support for community gardens, and the factors influencing residents’ decisions between advancing the costs for their own housing development beautification projects or abandoning their gardens altogether. Chapter five concludes with recommendations on how best to implement and expand NYC’s garden programs.

Keywords: community gardens, urban agribusiness, New York City, history, anthropology, politics, NYCHA
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Introduction: The Unaddressed Future of NYCHA Gardens

“This here, a Damask Rose... these roses are from Turkey, they are very important to me and to my mother.”

-Tenant, Washington Houses, East Harlem

To a gardener, the garden is the manifestation of years of toil and sweat. Like a novel to an author, or a melody to a musician, the beds of flowers and bushels of vegetables represent the time and work the gardener puts into their craft. While working for the New York City Department of Parks and Recreation’s GreenThumb program, I was able to see first hand the product of these gardeners’ hard work. For some background, the New York City Housing Authority (NYCHA), the government provider of low and middle income subsidized housing, has been undergoing heavy budget cuts to recreational activities, and in the last five years has effectively reduced the funding to support gardens to zero. NYCHA has since sought the New York City Department of Parks and Recreation (NYCDPR) to assume management of all the community gardens on all NYCHA properties. My job was to do the early stage groundwork to determine the feasibility of this project. Over the course of two and a half months, our team of six surveyed and collected data at the NYCHA properties. Our work included assessing characteristics including size, street access, type (flower, food, or mixed), water access, distance from building, number of raised beds, and many other criteria. In my time at these sites, I met some of the city’s most disaffected gardeners, people who had their gardens engulfed in litter, soil uprooted by construction, and finally told that there were no more funds budgeted for fertilizer, seeds or water.
Seeing gardeners who hold such a love and passion for what they create while also being so worried that they may lose it was devastating. This fear is reflected in the anxiety of a tenant living in Washington Houses, afraid that the roses his mother had brought from Turkey would wither and die because litter and waste was polluting the soil. This uncertainty is reflected by the woman in Morris I Houses who has to decide between buying healthy soil to grow fresh vegetables for her family or having to take frequent, long bus rides to the nearest fresh produce vendor because she lives in a food desert. In the last week of my work, I was able to see what the GreenThumb managed gardens were like, and the effects of proper funding were obvious. Beautiful gardens tucked away between the blocks of concrete and brick. Communities organized around these gathering spaces with activities like yoga classes, guided meditations, cookouts, and concerts. Environmental sustainability principles were always a focus, with composting, recycling, and water retention being an important feature at most sites. The presence of these gardens allows children to play in a green space and gives the elderly a restful, cool place to sit. One can’t help but be hopeful that this could be the future for more people in the city as well.

I have broken down what my work with the NYCDPR during the summer of 2017 consisted of, including the assignment, the planning and methods we chose to use, and some of the specifics of what are work consisted of.

**Assignment:** Our goal was to catalog all of the estimated 600 resident gardens on NYCHA properties in the city, tagging each garden’s location on NYCDPR Collector app for eventual uploading into the NYC Parks’ GIS system. Another goal was to record qualitative and quantitative characteristics of each garden, as well as survey any gardeners on-site
who were willing to talk to us. The goal of this assignment was to help the Parks Department determine whether it could support or manage NYCHA resident gardens.

**Planning:** In order to find all of the resident gardens on NYCHA property, it was decided to first make site visits to every single NYCHA campus in all five boroughs that had evidence of a garden. At every site, information provided by NYCHA was used to locate every registered garden, and scout the entire campus for any unregistered gardens. Using a recently updated master list of all gardens registered to NYCHA’s registered garden program, as well as a 2015 Powerpoint slide listing all of the developments with resident gardens, a map of all of the NYCHA sites to visit was made. Although the 2015 Powerpoint slide was not up-to-date, and included developments that did not have any registered gardens on the master list, it was also assumed that many gardeners had not updated their registration. Every development was assigned to a zone, a cluster of 5-10 developments that were close together, estimating that it would take each team 2 days to find all of the gardens in a particular zone. After every NYCHA development with evidence of a possible garden was visited, it was decided to visit several NYCHA campuses without registered gardens. The list of NYCHA campuses without gardens were narrowed down to those that might have had the space for a garden (determined via Google Street View and the Collector Map Viewer), focusing on developments that were clustered together. Most developments were accessible by public transport

**Coordination with NYCHA:** The survey team’s coordination with NYCHA began by meeting with GreenThumb and NYCHA staff, including deputy director of NYCHA’s Department of Resident Engagement Juan Santiago, and Community Associate Akela Tucker in late June. During the meeting, Juan and Akela outlined the history and scope of
NYCHA’s resident gardening program, as well as the program’s current difficulties stemming from a recent loss of funding. Following the meeting Akela sent out master lists containing the names and addresses of all gardens registered with the program. Additionally, the PowerPoint presentation containing a 2015 map of all NYCHA campuses with registered gardens was distributed. During the fieldwork, Akela and her coworker Denise occasionally accompanied us to the NYCHA developments (which they were visiting to judge resident gardens for their annual awards ceremony), where they helped us scout gardens and introduced us to gardeners and property managers. They also assisted with planning by relaying which developments listed on the 2015 map had removed their gardens. During the site visits, NYCHA property managers and on-site staff were generally preoccupied with other issues, and did not usually know surveyors were coming to visit. As a result, they could not be of much assistance to help locate gardens. However, on-site maintenance staff did help locate gardens on multiple occasions. Yet NYCHA resident gardeners, particularly leaders of local Tenants’ Associations and Garden Associations and lead gardeners, were extremely helpful. On many occasions they gave tours of all the gardens on the entire campus, assisted with surveys, and identified certain characteristics of the gardens.

**NYCHA Section 8 and FHA Repossessed Houses:** Since the primary project goal was to find gardens that had registered with NYCHA’s garden program, resident gardens in Section 8 housing were not surveyed. NYCHA’s gardening program only supported gardens on NYCHA property. Although Section 8 renters receive public assistance, Section 8 properties are privately-owned and managed. Thus, we had no information about gardens on Section 8 properties, and had no permission to enter any Section 8 property.
Furthermore, the hundreds of FHA Repossessed Houses owned by NYCHA were also not visited. Without any specific addresses of gardens in the FHA Houses, finding gardens in these properties would be next to impossible.

**The Future For These Green Spaces:** While the public is clearly the target for who these gardens benefit, private business also benefit from the beatification of the areas and the tourism or general increases in foot traffic that may result. The High Line brought nine seasonal vendors to sell food and goods, as well as let art exhibitions bring their commissions to the park.¹ Three million people a year come to walk the High Line, and this foot traffic results in business for the local community. Gardens not only attract people from outside the community, they invigorate people within the community to be active and social, qualities that in addition to improving mental and physical health also lead to more market participation.² The mental and physical health chapter will discuss at greater length the relationship between happiness and participation.

This thesis proposes that the utility of community gardens is worth the government spending it requires to expand and support them. Chapter 1 covers the scope and cost of the current gardening programs, including the current NYCDPR budget and number of gardens currently managed or supported by GreenThumb. It also will show the data collected concerning NYCHA properties. Chapter 2 puts the gardening programs into historical perspective, covering the history of agriculture in NYC. Chapter 3 quantifies both the physical and mental health benefits created by gardens in urban areas, drawing from various scientific studies examining human health and behavior. Chapter 4 discusses the political climate in NYC and how it affects budgetary decisions for the NYCDPR, with

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¹ Friends of the High Line Fact Sheet
² Participation: The Happiness Connection, 6
observations from my work with GreenThumb as insight into how government agencies manage with limited funding. Chapter 5 will conclude with recommendations for future projects and expansion, drawing from the earlier chapters and expanding on how the costs are well worth the benefits.

Chapter 1: Scope and Cost

There are currently 536\textsuperscript{3} community gardens that are owned by the New York City Department of Parks and Recreation GreenThumb across all five boroughs. In fiscal year 2017 the NYCDPR's budget was $480 million. The GreenThumb department was given $2.4 million (0.5% of total NYCDPR budget) in fiscal year 2017, which was an increase of $946,917 from fiscal 2016. The NYCDPR, as of 2017, has not finalized the budgeting for the NYCHA acquisition, but it is possible to postulate what kind of expansion would be necessary based on the number of gardens surveyed within NYCHA properties.\textsuperscript{4} There are currently 595 gardens within the 146 NYCHA developments across all 5 boroughs, meaning that the GreenThumb budget would need to essentially double in size, or another department of equal size would need to be created. Based on the 2017 budget, the GreenThumb would require a total of about $5 million to manage the total 1131 gardens. Here is the official conclusion that my team and I submitted for our Citywide Survey and Analysis of NYCHA resident gardens, which is helpful in understanding the scope of the work done. “Although it has supported resident gardens since the 1960’s, NYCHA has been forced to withdraw funding from its resident gardening program due to recent budget cuts. As a result, NYCHA is now considering partnering with NYC Parks to ensure that resident

\textsuperscript{3} NYC OpenData, Parks Properties
\textsuperscript{4} Levine 345
gardens across the city get the support and resources they need. Many different factors will be incorporated into this decision to fulfill all of the legal, administrative, and technical requirements of a partnership. One major impediment to this potential partnership is that the data on the locations and characteristics of hundreds of gardens across NYCHA developments are largely uncollected. Our goal as a team was to conduct fieldwork to map and capture the physical characteristics of all registered and unregistered NYCHA gardens throughout the five boroughs, as well as to speak with gardeners in order to gain an understanding of each garden’s reliance on NYCHA support. Over the course of the project, we found and mapped 595 gardens across 146 developments in all 5 boroughs, ranging from small 10x10 family plots to large community farms. Our results will potentially inform whether a city-wide partnership between NYC Parks and NYCHA is possible, and will help determine which resident gardens NYC Parks and GreenThumb can support.”

It is also important to understand the characteristics of the NYCDPR gardens and the NYCHA gardens because different preexisting characteristics require different levels of funding. Gardens that grow food require both raised beds and heavy metal soil testing. Additionally they require more water and more tools to harvest crops. The data I collected in Table I show the most important data gathered, and it shows that 89% of the NYCHA gardens have fencing, 59% of the gardens have street access, 1% have greenhouses, 47% have raised beds, 5% have composting. Also, of the 536 NYCDPR managed gardens, 460 are currently growing food. Gardens without street access, raised beds, or composting need to have these attributes added, and they are expensive undertakings. For example, a 10’x10’ plot could cost up to $300 to install fencing, and some gardens would cost thousands of

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5 NYCDPR Citywide Survey and Analysis of NYCHA Resident Gardens, i-ii
dollars to make street accessible. These are a few examples of unregulated garden characteristics that could impact the cost of the acquisition. Chapter 5 will examine these potential idiosyncrasies across differing gardens, and further elaborate on the ways that NYCDPR can best acquire the NYCHA gardens while still minimizing cost.

Table I: Composition of NYCHA Gardens based on physical characteristics, 2017

<table>
<thead>
<tr>
<th>Field</th>
<th>'Yes' Count (%)</th>
<th>'No' Count (%)</th>
<th>No Data Count (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Access</td>
<td>354 (59%)</td>
<td>241 (41%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Fenced</td>
<td>479 (81%)</td>
<td>113 (19%)</td>
<td>3 (0%)</td>
</tr>
<tr>
<td>Greenhouse Present</td>
<td>8 (1%)</td>
<td>585 (98%)</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>Raised Beds</td>
<td>278 (47%)</td>
<td>315 (53%)</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>Pathways On All Sides</td>
<td>186 (31%)</td>
<td>406 (68%)</td>
<td>3 (0%)</td>
</tr>
<tr>
<td>Composting</td>
<td>31 (5%)</td>
<td>551 (93%)</td>
<td>13 (2%)</td>
</tr>
<tr>
<td>Sign Present</td>
<td>137 (23%)</td>
<td>450 (75%)</td>
<td>8 (1%)</td>
</tr>
<tr>
<td>Shed Present</td>
<td>23 (4%)</td>
<td>570 (96%)</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>Rain Barrel</td>
<td>13 (2%)</td>
<td>580 (97%)</td>
<td>2 (0%)</td>
</tr>
<tr>
<td>Rat Burrows</td>
<td>121 (20%)</td>
<td>459 (77%)</td>
<td>15 (3%)</td>
</tr>
<tr>
<td>Play Area Adjacent</td>
<td>205 (34%)</td>
<td>376 (63%)</td>
<td>14 (2%)</td>
</tr>
</tbody>
</table>

Another key aspect of gardens effectiveness in terms of the benefits they bring to the community is the equitable distribution of the gardens across boroughs. Currently, the NYCHA distribution reflects the concentration of developments, as seen in the table below (Graph I and Table II). As the data shows, Brooklyn has the highest number of NYCHA gardens at 235, which is to be expected considering the estimated population of 2,648,771. Manhattan is the second highest with 147 gardens and a population of 1,664,727, which does not line up with population, considering Queens has the 3rd highest number of 92
gardens, and has an estimated population of 2,358,582. Bronx follows in expected line with 85 gardens and a population of 1,471,160, and finally Staten Island with 36 NYCHA gardens and a population of 479,458. While looking at NYCHA gardens is helpful, it is also important to look at the parks GIS data to get an understanding of how many NYCDPR gardens there are in these areas before evaluating the numbers further.

Graph I: Gardens Per Borough 2017

<table>
<thead>
<tr>
<th>Borough</th>
<th>Gardens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronx</td>
<td>85</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>235</td>
</tr>
<tr>
<td>Manhattan</td>
<td>147</td>
</tr>
<tr>
<td>Queens</td>
<td>92</td>
</tr>
<tr>
<td>Staten Island</td>
<td>36</td>
</tr>
</tbody>
</table>

Table II: NYCHA Gardens by Borough 2017

<table>
<thead>
<tr>
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<tr>
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<td>92</td>
</tr>
<tr>
<td>Staten Island</td>
<td>36</td>
</tr>
</tbody>
</table>

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6 US Census Bureau, “NYC At A Glance”
The GIS data for the parks department shows that there are 226 gardens in the Brooklyn, 151 in Manhattan, 35 in Queens, 120 in the Bronx. Brooklyn is 69.5 mi² with a population of 2,648,771, (Staten Island is not included because no gardens are under direct management by GreenThumb). Manhattan is 22.82 mi² with a population of 1,664,727. Queens is 108.1 mi² with a population of 2,358,582. And the Bronx is 42.47 mi² with a population of 1,471,160. This data shows that how many gardens exist per capita and the garden concentration per mile in each borough: Brooklyn has 1 garden for every 11,720 people and 3.2 gardens/mi². Manhattan has 1 garden for every 11024 people and 6.6 gardens/mi². Queens has 1 garden for every 67,388 people and .32 gardens/mi², and the Bronx has 1 garden for every 12,259 people and a 2.8 gardens/mi². Looking at NYC census data also tells us that Manhattan contains the highest average income, with three of the top census tracts (south of 110th street) having an income of over $200,000 annually, and the Riverdale area of the north Bronx has similar average incomes of over $160,000. The poorest parts of the city are the South Bronx Mott Haven, Morrisania, Tremont areas, the Far Rockaway area of Queens, and the Brownsville/East NYC area of Brooklyn, all of these areas with average incomes of <$20,000 annually, just straddling the poverty line for a family of three at $20,420. The GIS data shows us that there is a very low concentration of gardens in Queens and the Bronx while Manhattan has a very high concentration of gardens. There is a correlation between the concentration of gardens and income, and while there may be other factors influencing this, it is likely that this is the reason for the inequitable distribution.

7 NYCDPR GIS Data, GreenThumb Gardens
8 Census Fact Finder: Riverdale/Feldon. Upper East Side.
9 Census Fact Finder: Mott Haven, Morrisania, Tremont, Far Rockaway.
A comparison to other cities and their spending on parks and recreation is important in contextualizing where NYC stands, and what kind of budgets are feasible. In fiscal year 2016, Los Angeles had a budget of $256 million for its parks department, which is 2.9 percent of the city’s total $8.7 billion dollar budget. In fiscal year 2016, Chicago’s park district had a budget of $449.4 million, or 5.7 percent of the city’s total $7.84 billion budget. NYC’s department of parks and recreation budget was $480 million, or 0.6 percent of the total city budget of $73 billion. NYC has a population of 8.53 million, and spends only $10 million more on the parks department than Chicago, with a population of 2.705 million. LA has a population of 3.976 million, and still they spend almost 2 percent more of their total budget on the parks department than NYC. These cities are very different in terms of economics and population, but still NYC is spending much less per person than other large metropolitan areas when looking at parks and recreation budgets. These statistics suggest that it is neither impossible nor irregular to spend higher percentages of total city budget on parks and recreation, which could mean more funding for community gardening programs.

Community gardens directly address the growing unsustainable lifestyles that many people around the world have adopted since industrialization. Food production has been sourced primarily to industrial farms and the produce grown needs to be shipped and trucked around the country to get it to people living in urban areas. Combined with the fact that these industries are massively polluting, it becomes extraordinarily burdensome on the environment. For example, in the Millennium Assessment, Reid observes that “in 1996,
the cost of U.K. agriculture resulting from the damage that agricultural practices cause to water (pollution and eutrophication, a process whereby excessive plant growth depletes oxygen in the water), air (emissions of greenhouse gases), soil (off-site erosion damage, emissions of greenhouse gases), and biodiversity was $2.6 billion, or 9% of average yearly gross farm receipts for the 1990s.” If people were less reliant on these types of agricultural practices that massively pollute and damage the ecosystem, some of this cost could be mitigated. The costs imposed on the environment are staggeringly larger than the benefit we derive from the poor agricultural practices. Community gardens are sustainable because there is little waste, efficiency in composting, and there is much less need for large amounts of pesticides and high nitrogen fertilizer (the two most damaging aspects of industrial agriculture).

Another aspect of community gardens sustainability principles is the utilization of natural ecosystem services to benefit people. Each of these will be discussed more in depth in chapter three, but for a brief contextual overview, gardens provide four main categories of services: provisional, regulation, habitat support, and cultural. Provisional services include food, and medicinal services (healing herbs, aloe vera, etc.). Regulation services include local climate and air quality regulation, water aquifer purification, carbon sequestration, microbial wastewater treatment, limited erosion prevention, pollination, and biological control. Habitat and supporting services include the creation of habitats for various species, as well as maintenance of genetic diversity. Cultural services include providing recreation, improving mental and physical health, acting as an attraction for ecotourism, connecting people back to the natural aesthetic (extra important because of

13 Reid et. al. 8-9
the lack of nature in everyday city life). Finally they help build communities, serving as a meeting place, a place to share culture through music, food, and language.

Unsustainable practices are degrading these ecosystem services. The Millennium Assessment argues, “Approximately 60% of the ecosystem services evaluated in this assessment (including 70% of regulating and cultural services) are being degraded or used unsustainably.”\textsuperscript{14} This degradation of ecosystem services causes damage to human well-being, and trends towards unsustainability impose heavy costs on all people. While the Millennium Assessment’s scope is global, this theory still applies on a local level. Air pollution lowers life expectancy and increases medical costs for people in cities, water pollution requires added spending on water filtration for municipal water, and soil degradation destroys natural areas for people to enjoy.\textsuperscript{15} Funding the creation of green space is not only a fiscally sensible decision, it promotes an ideology that understands the burden to protect these natural services is on us.

\textbf{Chapter 2: History of Agriculture and Gardening in New York City}

NYC’s agricultural history can be summarized by industrialization and urbanization. In the early 18\textsuperscript{th} century, what is today the north Bronx was primarily agricultural land, growing various subsistence crops as well as cash crops like tobacco. In 1790, 95% of the population in the United States lived in rural areas, and the agrarian lifestyle was the cultural identity of the country. Because the Bronx/Westchester area is well situated between the island of Manhattan and New England, farmers were very successful because

\textsuperscript{14} Reid et. al. 6
\textsuperscript{15} Reid et. al 6-10
the populations of these two regions were the largest in the country.\textsuperscript{16} As the city grew, and industrialization led to urban sprawl, the agricultural sector in what is now Westchester began to change into residential and commercial zones. By 1900, nearly 50\% of the country’s population had moved to the cities.

As NYC’s population began to grow, and national transportation systems matured exponentially, it was most cost effective to look for areas that had the most efficient forms of food production. States like Kansas, Colorado, Oklahoma, Texas, and New Mexico began producing massive amounts of food in the 1930’s to support this population growth, but their poor agricultural practices and over-tilling led to the desertification of their agricultural lands, known as the Great Dustbowl. The Federal government instituted new agricultural agencies like the Soil Conservation Service and the Farm Security Administration to prevent any future agricultural disasters, and many New Deal policies were aimed at helping regulate the agricultural industry.\textsuperscript{17} Now at the turn of the 21\textsuperscript{st} century, nearly all of the city’s food comes from the goliath agribusinesses, which grow primarily in California, Texas, Nebraska, Illinois, Minnesota, Kansas, Indiana, Wisconsin and North Carolina.\textsuperscript{18} These nine states provide food for most of the country. Today there are still some very small-scale urban farms, such as the Battery Park Farm and Randall’s Island Farm, as well as the Grange rooftop farms in Brooklyn. These farms, though, produce less than 1 percent of the food consumed in the city, and serve primarily as educational or recreational spaces.

\textsuperscript{16} Peterson 1
\textsuperscript{17} Stiener 188
\textsuperscript{18} Saunders 1-5
Community gardening in the eastern United States has evolved alongside the history of agriculture, mostly because of the rise of city life and demographic transition to urban environments. As agriculture began to move away from the sprawl of cities during the late 19th century, community gardening became more popular. For example, in the 1890’s, Detroit mayor Hazen Pingree sponsored the country's first community gardening campaign. Abandoned lots across the city were reclaimed and renovated into gardens, which reintroduced the natural aesthetic that had been lost due to urbanization.\textsuperscript{19} The two main outcomes of urban blight that gardens help to change are unattractive neighborhoods, and a lack of community identity.

There is a negative feedback loop when an area begins experiencing urban decay. Usually it begins with a large employer moving out of the area, like the auto industry in Detroit or the steel industry in towns across Pennsylvania. People who relied on these industries for employment often need to move away, leaving their homes abandoned and condemned, resulting in so-called “zombie” properties. Then, the remaining people in the community who weren’t necessarily as reliant on the industry become dissatisfied with how their neighborhood looks, and they too decide to move out. Projects like Mayor Pingree’s were very effective in helping to reclaim and revitalize communities, and programs like his have since been common in many of the nation’s largest cities, including NYC. Remediation through gardens is not a novel concept, and earth artists have been able to turn urban blight into urban cultural centers. Nancy Holt’s “Dark Star Park,” and Mel Chin’s “Revival Field”\textsuperscript{20} utilize phytoremediation to draw out toxic chemicals from the

\textsuperscript{19} Smithsonian Gardens 1-3, 5
\textsuperscript{20} “Revival Field” \url{http://melchin.org/oeuvre/revival-field}
ground. This process is possible to implement in community gardens with the caveat that it can only be done with vegetation grown without the intention of consumption. Raised beds with clean soil are used for produce because of the toxicity of the soil in cities, so there would not be any phytoremediation. Art and gardens are both modalities that when given agency, can accomplish impressive intangibles that benefit the larger community in ways many don’t think possible.

In many ways, the community gardening program in NYC emerged from economic disaster. The Department of Parks and Recreation GreenThumb agency was initiated in response to the city’s financial crisis of the 1970’s. “Many parts of the NYC suffered, and vacant and abandoned lots—both public land and newly public land acquired by foreclosure—were endemic.” Abandoned buildings were appearing everywhere as investors and landlords began to relinquish their investments. The Manhattan neighborhoods most affected are the Lower East Side, Hell’s Kitchen, and East Harlem. A nonprofit environmental group dedicated to “preserving urban gardens, the Green Guerillas, started in 1973 by lobbing "seed bombs" packed with fertilizer, seed, and water over fences around vacant lots where access was otherwise limited in an attempt to beautify some of these eyesores with greenery.” These “Green Guerillas” unified their neighborhoods, and encouraged others to be engaged in the beautification of their own streets. This ideology is very prevalent today especially within environmental advocacy groups with environmental stewardship or environmental wisdom worldviews. While the grassroots campaigns were effective on their own, they also led to government assistance as well. Robert Moses can be credited with many government renewal projects in NYC.

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21 Martinez, NYCDPR History
22 Martinez, Green Guerillas
during the 60’s and 70’s. One of the many positions Moses held was Parks Commissioner of NYC, and he was able to turn many abandoned lots into what are now DPR managed and owned gardens.

In many cases, private entities and non-government organizations (NGO’s) have picked up were the government has left off, often in the form of partnerships. The New York Restoration project, for example, is the private partner of the Mayor Bloomberg’s “MillionTreesNYC” campaign, and has been very important in the revitalization and expansion of community gardening in NYC. Similarly, the City Parks Foundation, the Central Park Conservancy, and many of the private universities and schools in the city have done tremendous work funding and promoting community-oriented events. Chapter 5 will discuss in more depth how private institutions could help achieve a more ubiquitous community gardening system in the city, especially in low-income neighborhoods in the South Bronx, Brooklyn, and Queens. Because community gardens are non-excludable, there must be government subsidization if a private entity wants to enter the market, but ultimately the cost of subsidizing the gardens to keep them non-excludable is the best method in incorporating privatization.

More recently, gardens and green space in NYC have also been the focus of many artists. Alan Sonfist is one artist who made a stir in the art world when he was given the space to create his earthwork piece, *Time Landscape*. Earth Art as a medium through which artists can also act as people who reclaim nature has, in recent history, played a large roll in green space preservation. The *Time Landscape* was praised because it brought the natural aesthetic to the concrete jungle. The piece also acts as a link to the past, to a time when the Greenwich Village area was untouched by man. The *Time Landscape*, as described by the
NYCDPR, “portrayed the three stages of forest growth from grasses to saplings to grown trees. The southern part of the plot represented the youngest stage and now has birch trees and beaked hazelnut shrubs, with a layer of wildflowers beneath.”

The piece also has many personal connections with Sonfist, with saplings salvaged from his childhood park in the Bronx. This personal connection adds to the value of the piece because it shows the strength of the relationship between people and nature, as well as the persistence of nature long before and after one’s own life. *Time Landscape* also is seemingly a contradiction of earth art because it brings it to an urban setting. Most earth art work, such as *Spiral Jetty* by Robert Smithson, the works in *Roden Crater* by James Turrell or the *Bunjil Geoglyph* by Andrew Rogers can only exist in massive natural spaces, yet Sonfist did the opposite, taking a small plot of urban land and making the most of it. Sonfist is an interesting artist because he grew up in the Bronx, and has a personal connection to the built environment that can be changed and improved through gardens. Sonfist said in an interview “My life began in the teeming Jungles of the South Bronx. On the way to school I passed smoldering fires and packs of dogs eating garbage. There were no trees anywhere – the few that had existed were long dead – there were only concrete streets and brick buildings. The streets were divided between local gangs and each gang controlled a section. Each day my walk to school was a passage through terror and my survival depended on my urban instincts. This was my first experience with nature.”

Here he puts nature at odds with urban blight. Teeming jungles give the idea of bountiful habitats, but Sonfist puts in the dichotomy of the dogs eating the remains of human waste. Sonfist's work also helped to establish a stronger sense of community, as seen in some of the photos during the work’s creation (Figure 1). The photo shows how people of all ages gathered to

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23 NYCDPR Archive, “Time Landscape”
24 “The End of Art” Sonfist 35
see what Sonfist was creating, nature being something so strange in Lower Manhattan. This sense of community is what the next chapter will focus on, in terms of its benefits to individuals as well as the city society as a whole.

Figure 1: Early photos of work being done on “Time Landscape,” 1965

The art history aspect of gardens is also a key part of the idea that gardens can be cultural centers of ethnic enclaves. An example of this is Manny Vega’s art across Spanish Harlem, many pieces of which reflect the Puerto Rican-American experience. These pieces, typically either large murals or mosaics are often in community gardens because they are a
focal point for the community. One example is the Modesta Flores Garden, which contains many sculptures and murals. People gather to see Vega’s work because of its cultural and historical importance in a part of NYC that is constantly changing in ethnic and cultural composition. Gardens have acted as bastions of culture for years, and to have more gardens would mean to have more outlets for artists of various backgrounds to express themselves, their culture, and their history.

One of the most recent trends in gardening history in NYC is the concept known as “ZFarming.” Discussed by Hania Hribal-Kornilowicz in “Infiltrating Green into the Urban Machine: Creating Equity Through Zero-Acreage Farms in NYC,” she writes, “ZFarming is an out of the box solution for numerous current and projected future urban ills. It is defined as innovative forms of green urban architecture that combine food production and design in order to produce food on a larger scale in and on buildings through the construction of rooftop horticulture, rooftop greenhouses, indoor farming (vertical farms), and other building related forms. The idea behind ZFarming is to link food production with buildings to create a small-scale resource recycling and savings system. The free space for urban agriculture is limited and will be increasingly more desirable as city populations continue to grow and development increases. Access to green space is a related issue that ZFarming can solve through the creation of creatively placed green spaces throughout urban areas where ground level land is unattainable.”

Essentially, zero space farming is a solution to extreme urbanization. Ground is not available so the next best solution is to create indoor or vertical hanging farms. Conceptually similar to the Hanging Gardens of Babylon, there are utility and aesthetic advantages of removing the need for traditional farming methods.

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25 Hribal-Kornilowicz 4-5
While these kinds of projects are marvels of modern engineering, the question becomes why overcomplicate the problem? Yes, certain parts of NYC have next to no free space, but there does exist free space in parts of the Bronx, Brooklyn, and Queens that are not utilized because they are in less desirable neighborhoods.

**Chapter 3: Happy Gardens, Healthy People**

While I was working at the GreenThumb managed gardens, it was common to see the kids playing games, their parents chatting, and the elderly relaxing. Music would be playing, some gardens were large enough for yoga classes and other kinds of guided meditations; there was a general feeling or sensation of happiness that washed through everyone who entered the little escapes from the city. Community gardens benefit the mental and physical health of those who are able to enjoy them, and life in NYC is so stressful that these areas become even more important. The ecosystem services outlined by Walter Reid in the Millennium Ecosystem Assessment are important here in identifying how gardens better human health.

Ecosystem services that are important here are the cultural services. As stated earlier, the environment provides space to exercise in, and de-stress in. These cultural services are very important in NYC because much of the urbanization prevents other forms of ecosystem services from being utilized, such as the provisional and habitat services.26 Reid talks at length about the degradation of these services to the point of non-existence, and from an ethical and economic perspective it is wrong to continue to miss the utilization of them. One of the cultural services is open space for exercise, which in NYC is critically

26 Reid et. al. 10
important. A Department of Health and Mental Hygiene study says that more than half of adult New Yorkers are overweight (34%) or obese (22%). One of the main causes of this trend is a lack of physical activity, and one of the ecosystem services provided by these community gardens is a space for exercise. As part of the “BeFitNYC” campaign, The Department of Health and Mental Hygiene suggests that every New Yorker “get at least 30 minutes of physical activity 5 days a week” from walking, jogging, or being active in any physical activity to burn calories. A big step for many is simply getting motivated to go outside, and in many neighborhoods in NYC, there are a lot of contributing factors that create an environment of isolation inside one’s apartment. The community building elements of the gardens can help to encourage people to come outside, exercise, and get to know one another. Another limiting factor for many who want to lose weight is the cost of joining a gym. Joining community gardens is free with the only limiting factor being the availability and proximity to large residential areas.

Community gardens can also help reduce instances of asthma. Neighborhoods in the Southern Bronx, because of their proximity to waste transfer sites, have historically had some of the highest rates of asthma in the entire United States. In a short article by Gina Lovasi and James Quinn, the importance of green space as it relates to physical health and the reduced rates of asthma are discussed. They write that “Childhood asthma prevalence in the US increased by 50% from 1980 to 2000, with especially high prevalence in poor urban communities... Asthma prevalence among children ages 4-5 years old and asthma hospitalizations among children less than 15 years old were available for 42 health service

27 NYC DOH Website FAQ
28 Health Bulletin Volume 10, Number 8
29 Berg 120
catchment areas within New York City. (Street tree counts were provided by the New York City Department of Parks and Recreation.) Controlling for potential confounders, an increase in tree density of one standard deviation (SD: 343 trees/km2) was associated with a lower asthma prevalence (relative risk [RR]: 0.71 per SD of tree density; 95% CI [confidence interval]: 0.64-0.79), but not asthma hospitalizations (RR: 0.89 per SD of tree density; 95% CI: 0.75-1.06)." \(^{30}\) After gathering the data available, the study concluded that greenspace, specifically street trees, were associated fewer instances of asthma in early childhood. I extrapolate based on this study that community gardens have the same effect because they are often composed of many trees and vine shrubberies. Indoor air pollution also has massively higher effects on health than outdoor air pollution, so in instances where a child does not have a clean home, having outdoor places to go with clean air would potentially benefit their health. Lowering asthma instances could potentially better the lives of thousands of children living in NYC, and the research suggesting that gardens could be a factor in helping lower those numbers.

The mental health benefits of community gardens are just as important as the physical health benefits. In the report, “Understanding NYC’s Mental Health Challenge,” put out by the NYC Mayor’s Office, at least one in five adult new Yorkers is likely to experience a mental health disorder in any given year, which is close to 1.5 million people. Based on research from the New York City Department of Health and Mental Hygiene in collaboration with the NYC Department of Education, they found that over 8 percent of NYC public high school students report attempting suicide. The mental health crisis in NYC is not something that has one vertical solution; rather it is a wicked problem that requires a

\(^{30}\) Lovasi et. al. I-III
very horizontal and widespread solution. In Scott Weich’s “Mental Health and the Built Environment: Cross-Sectional Survey of Individual and Contextual Risk Factors for Depression,” he writes that “The prevalence of depression was associated with independently rated features of the built environment, independent of individual’s socio-economic status and internal characteristics of dwellings.”\textsuperscript{31} The study looked at what kind of natural light individuals had in their houses, as well as what kind of access to nature they had. The methods were a cross-sectional survey of 1887 individuals aged 16 years and older in two electoral wards in north London.\textsuperscript{32} The findings show a correlation between one’s access to a natural aesthetic and lower rates of depression. Although London and NYC are different, it can be argued that the same trends would appear as well, if not more strongly because of the more urban setting in NYC. This study suggests that community gardens and their proximity to a person’s home would result in lower rates of depression. Community gardens are at their core social spaces that promote interactions between individuals who may otherwise not engage one another. While it is not the only factor in a solution to the obesity epidemic, or the mental health crisis, it is without a doubt an important one.

Baird Calicott discusses in “Biophilia” the contrast between one having access to green space, simulated green space, and no green space. He writes, “Others have shown that nature contact, whether real or simulated, can be beneficial. For instance, a study of windowed and windowless offices by Heerwagen and Orians (1986) found that people in windowless spaces used twice as many nature elements (posters and photos especially) to decorate their office walls than those who had views of natural areas outdoors. A

\textsuperscript{31} Weich 14
\textsuperscript{32} Weich iv-v
laboratory study of “green exercise” tested the effects of projected scenes on the physiological and psychological outcomes of subjects on a treadmill (Pretty et al. 2005). They found that all subjects benefited similarly in physiological outcomes but that subjects who viewed pleasant nature scenes (both rural and urban) scored higher in measures of self-esteem than those viewing totally urban scenes or “unpleasant” rural scenes with destroyed landscapes.” Heerwagen and Orians, as Calicott notes, studied the desire of natural elements in environments without easy access to them. The fact that people seek to create these kinds of natural aesthetics, such as green landscapes, ocean views, etc., suggests that giving them access to the real thing is in their interest. Also the connection with self-esteem and pleasant nature scenes again reinforces the concept that community gardens are very effective at raising mental health standards.

Gardens and green spaces are shown to increase happiness and an important extension of that increase in happiness is discussed in Baker and Martin’s “Participation: The Happiness Connection.” Baker and Martin write, “Participation might increase happiness via creating and deepening relationships. Civic involvement builds personal connections that are in addition to the usual ones associated with family, work and leisure-time activities.” And the positive feedback loop is shown when they cite empirical evidence saying that authors Bruno Frey and Alois Stutzer found that “(there is) evidence that people who have more opportunities for participation... are more satisfied with their lives than those without such opportunities; in particular, Swiss citizens in cantons with higher opportunities for participation report significantly greater levels of happiness. Frey and Stutzer find that the opportunity to participate matters more than actual

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33 Calicott 110-111
34 Baker 9
So, Baker and Martin found that not only does social participation, be it community, family or political, lead to increased happiness, but also happiness fosters more social participation. This positive feedback loop is very important to community gardens because they themselves foster both aspects; the sense of communal participation, as well as the happiness of being connected with the natural environment.

Connected to the mental health considerations of gardens is the concept of moral hazards as they relate to neighborhoods. If a neighborhood is degraded and unkempt, there is no incentive for residents to act in ways to change this. Furthermore, they are in ways incentivized to continue littering, or vandalizing the area because it is easy or in some way desirable to them. Discussed by Gruber in “Public Finance and Public Policy,” a moral hazard is “an adverse action taken by individuals or producers in response to insurance against adverse effects.” If a community garden was put in a depressed neighborhood, I argue that the effects of moral hazards would decline. People would not be inclined to make their neighborhood look worse if efforts were being taken to make the area look better. Moral hazard is determined by how easy it is to change behavior in order to establish the adverse event, and if an area is already clean then there is little change in continuing to keep it clean.

Gardens when subsidized by the government can be seen as an indirect form of social welfare. Forms of welfare provision like cash welfare directly redistribute money from the wealthy to those in poverty, and the idea is that this redistribution of wealth can among other things promote the health and well-being of those effected. Gardens can in

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35 Baker 10-11
36 Gruber Chapter 12.5
37 Gruber Ch 17
essence do the exact same thing. They promote physical health as the NYC DOH has discovered, they can improve mental health and happiness as shown in Baker, Calicott, and Weich. Gardens provide intangible benefits that, although may be hard to quantify in dollars, are extremely beneficial to society.

Chapter 4: The Political Landscape

“Gardens (act) as sites of political contestation: Organized garden projects can become sites of political protest, opportunities for people who have been marginalized to formulate alternative discourses and to partake in communities of interest that push back against more powerful interests.”

- Shane Ralston

If the benefits of gardens are so great, why then is it that these public services have been lagging in implementation? The answer lies within the political systems in the NYC municipal government. Typically, social benefits are some of the first programs to be cut when budgets are being tightened, they are often classified as non-necessary or luxury services. This chapter will explain the history of NYC politics as it relates to community gardens, as well as the American federal government political landscape when it overlaps with pertinent issues.

While I was working with NYCHA, I experienced first hand how services perceived as luxury are cut away quickly, but often for good reason. While the benefits of gardens are

38 Ralston 64
substantial, NYCHA being the provider of both the recreational and public services means they often have to allocate budget to things that directly effect the health of residents. Councilman Ritchie Torres discusses in his report, “NYCHA 2020: Revitalizing New York City’s Crumbling Public Housing,” the inadequate status of these government subsidized housing projects. Torres writes, “Residents indicated unsafe, dirty and poorly maintained buildings. Over 60% of respondents reported something broken or damaged in their apartment at the time surveyed. A similar percentage of residents reported having issues with mold at some point during their tenancy. Nearly half of respondents stated that the conditions in their own apartment made them feel unsafe and just over half of respondents stated that the conditions in their housing development made them feel unsafe.”39 It is not fair to ask NYCHA to front the cost of community gardens when they cannot even pay for their buildings to be livable for their residents. The issue is amplified on a political level because the federal government’s budget proposal shows both a decrease in funding and a conditional increase in rent. In a letter from the HUD (Department of Housing and Urban Development) dated Feb. 26 2017, it was discovered that NYCHA’s aid would be slashed by 5%, worse than the 3% decrease city officials had planned for. The agency saw an additional $7.7 million in cuts to federal Section 8 programs from HUD.”40 While this paper is not specifically about government subsidization of low income housing, it is very much related because these institutions are the same that are supposed to be funding social goods like recreational services.41 Because these community gardens need to be non-
excludable, there is no private company willing to assume financial responsibility so it is the duty of the American political system act as overseer.

The question then becomes, what can the constituents do to self-advocate if their politicians are not properly representing them? Chris Smith and Hilda Kurtz write about this very issue in their article, “Community Gardens and the Politics of Scale.” The case study they look at is the NYC government’s attempt to auction the land of 114 different community gardens in 1999. They first state why the gardens are important, writing that “In community gardens, neighbors shared common green spaces where they could grow food to supplement their grocery budgets and plant flowers and trees to beautify their respective locales. Community gardens took root in nearly every neighborhood, and gardeners have spent thirty years creating a mosaic of green in spaces that were once havens for prostitution, drug use, abandoned buildings, and litter.” When the gardens were at risk of being taken away, the New Yorkers who cared made it an issue of “politics of scale.” Smith and Kurtz describe “politics of scale” as “the ways in which social actors draw on relationships at different geographical scales to press for advantage.” To better represent their ideas, the gardeners banded together; organizing their local coalitions into more cohesive units spanning the entire city. The Giuliani administration argued that the land needed to be sold to alleviate the housing shortage in the city, and that the use of land for gardens was not viable in the long run. Many groups came to the aid of the gardeners, including the American Community Gardening Association, the Lower East Side Collective, the Neighborhood Open Space Collective, Urban Outdoors, Cyberpark, as well as the Green

42 Kurtz and Smith 195
43 Kurtz and Smith 199
Guerillas. These groups had enough power to motivate people, who may otherwise have been indifferent to the gardener’s plight, to be active. After amassing enough press and making enough noise, the New York Attorney General sided with the gardeners as well and filed suit against the city. The following lawsuit eventually ended in favor of the gardeners, saying “The state law requires municipalities to perform an environmental review, similar to an environmental impact assessment, as well as to seek public input before selling publicly held properties.” The properties, in addition to not being sold, were also now part of environmental review, and thus calculated into the environmental health of the city. By being part of said review, they are effectively protected because any attempt to replace them would directly lower the environmental rating of the city. This case study shows that when people band together, they can spur political change. These 114 gardens would have been sold to the highest bidder and would no longer exist; meaning the social goods they provide through natural ecosystem services would no longer exist as well. This case study will be important in my recommendations for project expansion because if nothing else, it shows that people do care about their communities.

Charles Montgomery writes in his book “Happy City: Transforming Our Lives Through Urban Design,” about the relationship between implementing sustainable design in cities and the value of the land itself. Gardens help to create more independent living, in that they decrease reliance on external food production. Montgomery writes that for property owners, sustainability is an important characteristic that new investors and

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44 Kurtz and Smith 208
buyers are looking for.\textsuperscript{45} It is in a politician’s interest to pass laws and bills that increase the value of their constituent’s land, and in this case the means justify the ends and the ends justify the means. More people would get community gardens, and the value of the land would increase because of market demand. The counter argument to the increase in value from sustainability is that it is similarly just as bad for renters as it is good for owners. Gentrification is definitely a negative side effect of beautification, but it should not deter efforts to clean and better communities.

The political side of community gardens is linked to environmental racism and the politics behind the unfair allocation of resources to different peoples in NYC. In the book “Beyond the Kale” by Kristin Reynolds, this very situation is brought to light. Agribusinesses are so powerful that they have managed to make their products staples in most diets. “Beyond the Kale” looks to ways to reduce this need for agribusiness through local food growing, but also as a way to unite disenfranchised communities that have little to no political power. Reynolds writes that “Urban agriculture research and evaluation can be organized either in ways that result in the reproduction of injustice or in ways that help advance social justice through strategic communication and specific forms of technical assistance.”\textsuperscript{46} Reynolds also suggests gardens as a direct alternative to reliance on the grocery store, simply replacing small amounts of one’s diet with locally grown alternatives. It seems that the mindset shift itself is the factor that creates a feedback cycle where one can continue exploring different alternatives to agribusiness products. The main blockade at the moment is the constant and increasing government subsidization for mass-produced products, such as corn. The Energy Policy Act of 2005 mandates that corn be used for

\begin{footnotesize}
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\item Montgomery 245
\item Reynolds 124
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ethanol and be mixed into gasoline, resulting in over $5.5 billion (some estimates claim over $7 billion) in corn subsidies. These corn subsidies result in higher amounts of corn syrup based products, which in turn causes obesity and diabetes, diseases which cumulatively costs over $245 billion in medical expenses each year.\textsuperscript{47} Just like the case study from Kurtz and Smith, agricultural initiatives with the right communication across many different groups can help people advocate for themselves, and in the case of areas like the South Bronx or Jamaica, Queens, advocate for social justice.

Historically community gardens have grown a variety of healthy fruits and vegetables, which is an important characteristic when it comes to combating obesity and diabetes in NYC. Without much expertise, it is possible to grow beets, eggplant, onions, garlic, tomatoes, peppers, cabbage, carrots, and many other healthy options. Some gardens in NYC are large enough that they even grow potatoes and wheat, such as the Battery Park Farm, which donates nearly all of the food it grows to soup kitchens. Gardens cultivate healthy foods and attitudes, which is one of the most important arguments for their incorporation into NYC daily life. There is also a historical precedent for the use of community gardens as an alternative to mass food production. The United States Government encouraged citizens during both World War I and World War II to make personal “Victory Gardens” to alleviate stress on the limited food supply that was sent overseas to ration for soldiers.\textsuperscript{48} While the context is different, the solution is near identical. Instead of relying on agribusiness to supply massive amounts of food to people across the country, producing massive amounts of emissions and greenhouse gasses, the government could encourage people to grow their own foods. Because the situation is

\textsuperscript{47} NPR “Does Subsidizing Crops We’re Told to Eat Less of Fatten Us Up?
\textsuperscript{48} MacFarland xii
much less dire than World War I or World War II, the government could even subsidize some of the costs of Victory Gardens, giving out seeds and topsoil to those interested. Taking the capital input cost out of community gardens and making it only a matter of labor investment would encourage people who otherwise may want to be more frugal to become more self-reliant through the use of gardens.

Another political issue in NYC is the existence of large food deserts, primarily located in lower income, minority areas. A food desert is an area where it is overwhelmingly difficult or inconvenient to buy fresh food and produce. In Adi Segal’s “Food Deserts: A Global Crisis in New York City,” she writes that food deserts affect large numbers of people citing a DOH report that reads “About 31% of adults in East Harlem and 27% in Central Harlem are obese; in contrast, the citywide obesity rate is 22% and...about 13% of adults in East Harlem and 12% in Central Harlem have diabetes. As expected based on the demographics of the areas, East and Central Harlem are significantly underserved and exposed to health risks based on the options for food purchase in the neighborhoods.” 49 Typically lower income areas have weaker Not In My Backyard, or NIMBY, programs and are less able to advocate for their rights because of the amount of time required to petition representatives. While there should be groceries and fresh produce everywhere in the city, gardens do pose a very real alternative, to stores that sell fresh produce. Community gardens can grow and provide for hundreds based on a small number of raised beds. While gardening is time consuming, it is similarly time consuming to take a bus or train over 40 minutes away from ones home just to get access to fresh fruits and vegetables. If gardens can replace unhealthy foods for people who literally have

49 Segal 201
no other alternatives, then it makes sense for those who have the ability to expand their presence to do so.

The most important question for the political discussion becomes, what is the optimal way to provide public goods? In the case of gardens, we currently have an example of an impure public good because they are non-rival in consumption and technically non-excludable, but because they are not equitably distributed, we see that not everyone has reasonable access to a garden on a day-to-day basis. The optimal provision of the public good, then, becomes a vertical summation of the demands of those who are willing to pay for them. If person A values the gardens at $500 on and person B values them at $300, then the summation is $800, which then is the total social value of the good. Because some people contribute more for public goods, either because they simply have more willingness to pay or because they have a very strong preference for the public good, there also exists the free rider problem. One possible solution for the free rider problem is for the government to allow the private market limited intervention. The Business Improvement District (BID) is an example of such an intervention. In Times Square, the government spent years attempting to clean up the streets, sidewalks, etc., but faced enormous costs. A group of local businessmen, realizing that the cleanliness of the area was in their financial interest, then decided to create a BID, a legal entity that privately provides local services and funds these services with fees charged to local businesses. Another example of a BID showing effectiveness is discussed in Emily Putnam’s thesis, *Urban Parks for All: Reclaiming Public Green Space in New York City*. She writes that Bryant Park was drastically improved with the use of a BID, saying that “Management of the park has been the responsibility of

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50 Gruber, Public Finance and Public Policy, Chapter 7
the private Bryant Park Restoration Corporation (BPRC) since 1988 in an effort by the city to clean up the park which had fallen into decay following cuts to park funding in the 1960’s. Bryant Park had become home to drug dealers and the homeless and was regarded as an unsafe place. The BPRC is partly comprised of a business improvement district (BID) of neighboring property owners.\textsuperscript{51} Essentially, New York law is structured so that if the BID organizers can get over 60\% of the local business community to join, then the BID is able to levy fees on all local businesses. In the Times Square case, over 84\% of local businesses agreed to pay fees, so the fees were approved. What was then seen was a large increase in the cleanliness of the area, resulting in lower crime and higher business and tourism. I will discuss in my recommendation section about how exactly a BID could be created for public gardens, but essentially private businesses that benefit from gardens, that is, fertilizer manufacturers, garden supply outlets, music venues, catering companies, etc., could create a BID, overcoming the non-excludability assumption\textsuperscript{52}, and help provide this public good while also benefiting themselves. Most private companies assume that when a good is non-excludable, like a public park or a sidewalk, it is not in their interest to invest because it is impossible to discriminate between people who are willing to pay and those who are unwilling to pay from accessing the good or service. Essentially, a BID overcomes that assumption through the realization that these public non-excludable goods provide positive externalities and the internalization of these positive externalities can increase revenue.

In the case that a green space is offered to a community, it is often difficult to decide what to do with a space when a community is given choices. Because many individuals

\textsuperscript{51} Putnam 28-29
\textsuperscript{52} Gruber Chapter 6-7
have many different tastes and preferences, it is good to aggregate these preferences as effectively as possible. In this case, majority voting is a system that is a way to consistently aggregate preferences. Majority voting must satisfy three goals: 1. Dominance: If all voters prefer one choice, then this must be the choice made by society. So if everyone prefers planting a flower garden to a vegetable garden, the social decision must be to plant the vegetable garden. 2. Transitivity: If a combination (flower and vegetable) garden is preferred to a flower garden, and a flower garden is preferred to a vegetable garden, then a combination garden must be preferred to a flower garden. 3. An Independence of irrelevant alternatives: If one choice is preferred to another, then the introduction of a third independent alternative will not change the ranking. If a flower garden is preferred to a vegetable garden, then this must still be true if a new playground is suggested for the space as well.\textsuperscript{53} As long as these 3 goals are satisfied, the decision of what to do with the space is entirely in the hands of the community.

\textbf{Chapter 5: What it at Stake? Recommendations for Future Expansion}

While working with NYCHA and GreenThumb managed gardens, I learned that at its core, gardens are about happiness. I worked with people who had spent years of sweat and toil pouring all their spare time into their gardens. I talked with people who grew up in the South Bronx Throggs Neck Houses area whose only experience with nature were the few gardens and parks that spot the otherwise built environment. I was also able to see what the effects of losing green space were. A small NYCHA development in the Soundview area had recently had almost all of their individual lot gardening space, cut back to add more

\textsuperscript{53} Gruber Chapter 8
space for roadways, primarily for construction vehicles. A woman told me that her garden, composed of a few rose bushes that she had taken care of for years, were cut down in a few hours. This woman, probably in her late fifties, was absolutely dejected and disheartened. Gardens are associated with warmth and happiness, and to see her despairing disposition and lack of optimism was in part what drove me to take such an interest in the subject of community gardening and the equitable distribution of gardens to low income areas.

The other end of the spectrum is the heartwarming smiles and happiness that exudes from an active garden. Some of the better-funded gardens in Lower Manhattan, around South Houston area were like little oases, often little casitas with people relaxing with the aromas of the produce they were growing all around. Functions such as concerts, barbeques, and festivals of all kinds were common, which established these areas as local community builders. I originally volunteered at the Herb Garden because I wanted to get a first hand experience in a community garden, but I have since continued volunteering my time there and elsewhere as much as I can because of the relationships I have created with the people in the area. My final personal anecdote is about the Annual Garden and Greening Awards, which encapsulates everything that community gardening is about. Every year NYCHA employees go around the city to every registered community garden and give out awards for categories like “Best Flower Garden,” “Best Vegetable Garden,” and “Best Themed Garden.” While my team was out collecting data, the judges for the award ceremony were also out rating the gardens. Often the themes of the gardens are the forging of friendships, as well as the protection of at risk youth from being involved in crime. Again these kind of things are hard to put a dollar value on, but regardless it is very clear that they have important, wide reaching impacts. Making a beautiful community garden is not
the end result of an individual’s work; rather it is the result of a community coming together to create something truly special.

I recommend that NYC allocate an increase of no less then $20 million, or about .03% of the annual municipal budget to the GreenThumb department over the next 10 years or until every NYC resident is in within walking distance to a community garden. In chapter 2 it was shown that of the $73 billion budget, NYC currently only spends $480 million per year on the DPR, meaning a 0.03% increase would equate to an annual $20 million growth in DPR budget. I arrived at this number because the estimation of GreenThumb is that another department of equal size would be required to acquire and develop the NYCHA gardens discussed earlier, which would at least cost $5 million. It is then important to find out how many more gardens would need to be created in order to increase walkability and accessibility requirements. Based on the data available on the Parks GIS system, I estimate that about one third of the city’s residents are not within reasonable walking distance of a public garden. Looking at the number of parks concentrated in the residential areas of Queens (which currently only has 35 gardens) and the South Bronx, which currently has fewer than 65 gardens (including Mott Haven, Melrose, Morrisania, Soundview, and the Hunts Point area). These areas constitute nearly 50% of the total NYC (without Staten Island) area, and make up a large amount of the city’s residential population. The collective budget, then, of these two agencies would be approximately $10 million, but because over one third of the city’s residents are currently not within walking distance to an available community garden\textsuperscript{54}, the $20 million dollar increase would constitute essentially a budget three times larger then the original.

\textsuperscript{54} NYCParks GIS “Residential Zoning”
In addition to the larger capacity of the Parks Department, the implementation of more Business Improvement Districts could also prove to be an effective strategy for providing more public goods for more people. The BID in Times Square proved that when businesses are able to collectively decide to improve the aesthetic of the area, the results are more business and tourism. In impoverished areas of NYC, the installment of more gardens could have similar results. Local businesses could create a BID and use the funds raised to clean up the area and create garden spaces that residents of the area could then enjoy with the tangential result of beautification of the area. Events like garden tours, showcases, small business expositions, and concerts could provide more foot traffic in the area, resulting in more business and tourism. GreenThumb already provides these forms of services for the gardens under their management, so the infrastructural know-how is already in place. The only question is whether BID organizers would be able to convince over 60% of the local businesses to join, but given good explanations of what the BID could provide for the community, it is well within reason that many would be very interested in seeing more tourism, cleaner streets, and generally safer and stronger business environments.

There are three major factors that together compose what I argue is the optimal plan that the NYC municipal government should follow: the economic factors, the environmental factors and the cultural factors. Each of these factors contains financial, ethical, and moral reasoning for why gardens are important in bettering the majority of NYC residential lives.
**The Economic Factors:** It is estimated that ecosystem services net a $33 trillion total value spanning the entire planet. While it is very difficult to say how much community gardens specifically attribute to this total, because there are so many health benefits, as discussed in chapter three, both mental and physical, it is without a doubt within the range of tens of millions of dollars. NYC is one of the densest cities on earth, meaning there is incredibly high efficiency when natural ecosystem services are promoted among the public. Again combined with the trend in rising healthcare prices across the country, the services provided by community gardens are so large that the $20 million investment would yield massive returns over the long term, as well as the short term. This particular investment can be seen in many ways as an investment in social welfare.

In terms of a method to actually discover the value of the gardens to individuals (because it is a non-market good), I suggest a Lindahl pricing model be implemented. The core principle of a Lindahl pricing model is the government needs to ask the people how much they value the gardens, and how much they are willing to pay to actualize the good. I believe that enough people value the gardens highly enough that such a model would result in the discovery of funding. There are three common problems with Lindahl models in general, individuals intentionally over or under reporting how much they truly value the good or service, an individuals lack of knowledge about how much they value the good or service, and finally the difficulty the government may have in surveying every person. I think that the latter two problems are non-issues in the case of community gardens because people in general know whether they will appreciate a garden or not. Similarly, NYC has a very established census gathering infrastructure in place so getting a vast majority of opinions would neither be difficult nor overly expensive. Given my work in the
field, a Lindahl pricing model would prove that there are a high number of willing participants who would be willing to contribute to funding community gardens for both their own personal enjoyment as gardeners as well as general community beautification. Included is a basic step by step model for the basic way NYC could implement a Lindahl pricing model. Lindahl’s procedure operates as follows:

1. The government announces a set of tax prices for the public good.
2. Each individual announces how much of the public good he or she wants at those tax prices.
3. The government repeats these steps to construct a marginal willingness to pay schedule for each individual.
4. The government adds up individual willingness to pay at each quantity of public good provided.
5. The government relates this overall demand curve to the marginal cost curve.
6. The government then finances this public good by charging individuals their willingness to pay for that quantity.

Essentially, the government is able to ask people how much they value gardens, and it follows that the optimal pricing (if there are no failures) should be that cumulative dollar value.

The Environmental Factors: Building upon the economic factors, the degradation of the environment through processes like urbanization and industrialization is something that community gardening addresses both directly and indirectly. Urbanization and green space proliferation are essentially opposites. As cities expand, they consume the natural areas around them and degrade the quality of water, soil, and air. This pollution directly

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55 Gruber Chapter 9
impacts the well being of communities both human and non-human in the area. There is some overlap with the economic factors at play because the toxic air, water, and soil have a dose-population relationship that incurs massive healthcare costs on those affected. There are also environmentally related ethical reasons at play as well. Captured in a quote by poet Walt Whitman, the ethical reasoning can be described, “After you have exhausted what there is in business, politics, conviviality, and so on - have found that none of these finally satisfy, or permanently wear - what remains? Nature remains.” It is the eternal quality of nature and our connections with it that many find one of the most important reasons for promoting environmental protection.

**Cultural Factors:** Often the most difficult to quantify, the cultural factors of community gardens go underappreciated. Green spaces are hubs for artistic expression, day-to-day conviviality, and relaxation. They also mitigate the effects of disaster by acting as places of public service announcements, and danger warning. People who may often never interact with one another can build relationships through community gardens, strengthening the identity of the city. A loss of public spaces is more than just a loss of something that is aesthetically pleasing to the eye, it is the loss of the intangible spirit that is near impossible to recreate. When the NYC mayor’s office threatened to auction off the land of 114 gardens, the community organized in an effort to defend what they held dear, and out of the fear of loss came strong bonds between people different backgrounds united by a small similarity, the love of gardens.

**Other Recommendations:** Beyond the factors and solutions listed already, there are other things I think would be important to implement in NYC that effect the expansion

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56 Walt Whitman, Specimen Days
of community gardening. From my experience at the NYCDPR, I learned that in many ways the current beekeeping registration process is sluggish and very restrictive, and I think that increasing the allowed numbers of registered beekeepers would tangentially work very well with community gardening efforts. Having more people of varied interests who utilize the same spaces and petition for the same efforts together would encourage politicians to better represent their constituents.

I also think it relevant to include a recommendation made by Emily Putnam in her discussion of green space reclamation in NYC. She proposes a solution for finding more NYCDPR budget, saying, “Since the lack of adequate Parks funding seems to require private interference, I think Parks could make new regulations to maximize what it can get out of the situation. Restaurants and other vendors with fixed locations like the Shake Shack at Madison Square Park take up more public space than a hot dog cart for example. These larger private spaces should have their vendor fees set at a higher percent of their revenue than the carts to make up for what they are taking away.” It is clear that these private entities are utilizing their government contracts for profit, but what is not clear is how the government is benefiting from the relationship. Putnam continues, saying “It would be a way to more closely account for negative externalities by designating them with a monetary value. The funds from vendor fees should be going right back to the Parks Department to distribute to parks as they see fit. Funds should be making up for lost public space by improving it elsewhere but under current policy this money goes to the city and is distributed in the greater budget. City funding to the Parks Department should be in addition to funds Parks have generated themselves, not comprised of it. Having the fee

57 Putnam 44
money go to Parks instead of to the city could help encourage the vendors to accept this new proposal since it would mean their money would improve the spaces around their ventures instead of not benefitting from the fees directly.”^58 I think that this internalization of negative externalities by the private market is in both the interest of the local business incurring the cost as well as the general public. These businesses and eateries would benefit a great deal from an increased Parks Department funding, and with an increase in funding for the entire department, we would also see an increase in GreenThumb funding.

Another recommendation is for more educational programs with community gardens. Currently the NYC public school and charter school systems have their own recreational areas for extracurricular activities, but these areas are primarily playgrounds. I think having more community gardens especially around schools would allow children to have a more direct and intimate relationship with nature. There are myriad life science lessons that can be taught at gardens, and having more opportunities for these lessons would only be beneficial to child development.^59 Also gardens teach many important life lessons for children such as patience, respect, and a sense of community, again reinforcing these concepts would only be good. Studies have shown that children with more access to nature are mentally healthier.^60 For most of history, children have had adequate access to fields and open natural spaces, but as city life has become more and more common, things that humanity has taken for granted for hundreds of years have become a luxury. In Shane Ralston’s “A Deweyan Defense of Guerrilla Gardening” he writes “Gardens (act) as inter-generational bridges: Gardens offer spaces for adults and children to deliberate, socialize,

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^58 Putnam 44-45
^59 Smith 210
^60 Sobel i-v
and transfer ideas from one generation to the next. Narrative and discourse within the
garden environment always start in media res, but they disseminate valuable insights to
later generations of community gardeners and gardening activists.” Gardens are
important connections between people in communities who may otherwise not share ideas
and experiences. Lessons from one generation to another are invaluable, and gardens
establish these lanes for the lessons to be taught.

To those who are more concerned with concrete statistics and numbers, it makes
financial sense to promote gardens because of the large amount of money they both
produce and save. To people who are more concerned with the ecological impact of the
city, gardens are environmentally friendly and promote sustainability as a core principal.
To those who are less concerned with the numbers and money, it is the relationships that
gardens create that are at risk. People need these gardens as much as a poet needs
language, or a musician needs an instrument, or a painter needs a canvas. The creation and
expression through nature is something that is otherwise impossible in a city, and to forgo
something so important and so intrinsically human would be an incredible loss. There is an
opportunity here to set in motion something that makes fiscal, moral, and ethical sense,
and other cities and countries have shown how possible it is. Even if it is just inches at a
time, any and all progress in expanding green space policies and growing gardens is a
fruitful endeavor, something that everyone can enjoy.
I have included some images of gardens on NYCHA developments as a visualization of what an expansion of community gardens could look like.

Photos taken by either my coworkers or myself:

**Example Garden 2: Queens - South Jamaica Community Farm:**
Example Garden 3: Staten Island - New Lane:
Bibliography:


Sobel, David (2002). *Children's Special Places: Exploring the Role of Forts, Dens, and Bush Houses in Middle Childhood*, Detroit, MI: Wayne State University Press


