Home Gardens: A Key to a Sustainable Future

Keara C. Galvin
Fordham University, kearagalvin@gmail.com

Follow this and additional works at: http://fordham.bepress.com/environ_2015

Recommended Citation
Home Gardens: A Key to a Sustainable Future

Keara Galvin
Fordham University
Environmental Studies Senior Thesis Spring 2015
Abstract

In today’s world of agribusiness and factory farming, the home garden provides an alternate source of nutritious food at the household level. The home garden occupies a unique place as a source of fresh produce, a place for families to unite, a cultural space to maintain one’s roots, and serves an ecological role in the greater landscapes that these gardens form part of. There is a lack of academic analysis and research done on home gardens. The majority of research on gardens is primarily technical -- tips on maintaining soil quality, on the best plants to grow, etc. Home gardens are worthy of a deeper analysis. This paper aims to broaden the scope of analysis by approaching the home garden through various frameworks—anthropology, history, and sustainable design. Home gardens are an act of rebellion against the monoculture of industrial farming and form the foundation of a sustainable future.

Key words
home gardens, household gardens, anthropology, sustainable design
Table of Contents

Acknowledgments

Introduction

Chapter 1. Measuring Gardens—Quantitative Data and Ecological Economics

Chapter 2. From Subsistence Gardening to Industrial Agriculture

Chapter 3. “Do You Need a Husband to Start a Garden?” – Cultural Meanings of Home Gardens

Chapter 4. Current Gardening Developments -- a Tour of Today’s Sustainable Gardens

Chapter 5. Politicizing the Garden—Political Perspectives on the Home Garden

Bibliography
Acknowledgements

I would like to thank my thesis advisor, Dr. Edward Van Buren for his support in the process of writing the thesis.

I would like to express my gratitude to the National Science Foundation (NSF) Research Experience for Undergraduate (REU) program, the University of South Florida and the Monteverde Institute. Through the collaboration of these institutions, I was able to gain practical experience in interdisciplinary research on home gardens in the community setting. This research project incited my interest in the topic of this thesis.

A special thank you to Dr. Nancy Romero-Daza and Dr. David Himmelgreen for your guidance throughout the REU program and beyond.

Thank you to Melissa Elder, Helchi Hindert, Zuriel Rodriguez and Joseph Snell, the Keyhole Garden research team, for your contributions and insights during the REU program.

An additional thank you to the members of the Monteverde community.

And finally, a thank you to my family.
Introduction:

Home gardens occupy a special place in American culture and cultures around the world. Many of us have fond memories of growing up with a garden, be it in our backyard, in a windowsill or in our grandparent’s house. Many of my childhood memories are rooted in the gardens I grew up in. Both my dad and my grandparents had a garden. My grandfather had a great attention to detail, and this was reflected in his garden. From the elegant birdbath to the careful arrangement of the tomato plants, he made sure his garden was as beautiful as it was productive. For both of these individuals their gardens were an essential part of their home, a place to escape from the challenges they faced in their personal lives. While I was growing up, the garden was a place of recreation and education, where I learned about the values of patience, the pleasures of home-grown food and spent quality time with my family. There was always a bowl of vegetables from the garden on the table at my grandparents' house. As I got older, my academic focus became the intersection between agriculture, wellbeing, and the environment.

Recently, my academic interests and personal interests combined when I worked as a researcher in Monteverde, Costa Rica in a National Science Foundation-funded Research Experience for Undergraduates (REU). In this unique project, offered by NSF in partnership with the University of South Florida and the Monteverde Institute, I worked with an interdisciplinary research team studying issues of globalization and community health. Our team’s project was about the community perceptions of a home garden in a community affected by food insecurity. Here I was able to see firsthand the ways that a home garden was received by

---

1 Research Experience for Undergraduates Site, Globalization and Community Health: Combining Social Science and Engineering, National Science Foundation award #1156735. N. Romero-Daza, PI and D. Himmelgreen, Co-PI, Department of Anthropology, University of South Florida
a community different than my own. This research experience provided an interdisciplinary
toolset to approach the study of home gardens. This ultimately sparked my interest in the
dynamic world of home gardens, making me want to analyze them from a broader perspective.

In this paper I plan to address the role of household gardens beyond the usual technical
analysis. Home gardens are connected to another set of issues, from land use to economics. In
order to better understand these interconnected conditions, I will utilize the disciplines of history,
economics and anthropology. Chapter 1 will define the home garden, use data from the National
Gardening Association to get a picture of contemporary gardening, and use the concept of
ecosystem services to analyze the wide array of benefits provided by home gardens. Chapter 2
will analyze the home garden historically, and compare this history to the rise of industrial
farming in the US. Chapter 3 will present an anthropological perspective of home gardens as a
vibrant cultural practice. Chapter 4 will analyze these gardens through the concept of sustainable
design with examples of current home gardens. Lastly, Chapter 5 will combine these various
disciplines and perspectives leading into policy solutions, where home gardens are part of the
alternative to industrial agriculture.
Chapter 1: Measuring Gardens—Quantitative Data and Ecological Economics

A home garden is a familiar object, but hard to define precisely and clearly. What is the distinction between a home garden and a small farm? A home garden is a few plants in a windowsill? Before studying home gardens, it is necessary to define what they are.

What is a home garden? To begin, a household can be defined as “a group of people who regularly work and eat together.”² Home gardens can be defined as “relatively small cultivated plots usually devoted in whole or in part to the growing of herbs, fruits or vegetables for household consumption.”³ Although they can be defined in this way, they vary in terms of the plants grown, the productivity and style of the garden and who participates in caring for the garden. In fact, because of this potential variation, “Gardens can be identified primarily by their function, rather than their form, location, size, or the types of crops grown. Whether controlled by the household or by an individual in the household, household gardens are secondary sources of food and income, while field production, animal husbandry, wage labor, professional services, or trading are the major sources of support.”⁴ Thus, a garden is not easily defined by its contents. There is a potential for variation across home gardens. A windowsill herb garden in New York City is just as much a home garden as a classic backyard garden in rural Pennsylvania.

In terms of function, the home garden is defined as a secondary source of food and/or income. So, a home garden isn’t the same as a small organic farm that is the primary source of income for the owners; a home garden is a secondary source of food or income. These owners

² Cleveland, David Arthur and Daniela Soleri. Food from Dryland Gardens: An Ecological, Nutritional and Social Approach to Small-Scale Household Food Production. (Center for People, Food and Environment (CPFE). Tucson, Arizona. 1991), 2
⁴ Cleveland, 2.
aren’t professional farmers nor devote their entire life to the maintenance of these gardens. These small-scale gardens merit a deeper analysis, as they form part of the local food movement. These gardens can be owned by anyone, from a single mom who uses the herbs in her kitchen, to a whole family who spends their weekends learning grandpa’s gardening secrets in the yard!

Home gardens can be divided into several main categories. The first is the kitchen garden; a small-scale garden in the backyard, typical of suburban America. A second category is the community garden, a small-scale communally owned plot or group of plots. The community garden is popular in urban areas, such as Manhattan’s Lower East Side neighborhood. This style of garden typically has individual plots for families or individuals but is owned and maintained by the community as a whole. The last category is a small farm, under an acre maintained at a family house. The primary focus of this research is the “kitchen garden,” the small-scale garden owned by a family. Although the typical image one has in mind is the tiny rows in the backyard, this garden type can also refer to small container gardening as well.

**Quantitative Data.** The data that follows is from a 2009 survey from the National Gardening Association (NGA). There is a limited amount of data available on home gardens, both on the global and national scale. What this data does provide, however, is insight on the motivations, popularity and demographics of US home gardeners. This data was acquired from Internet-based surveys, aiming to encapsulate information about the experiences and attitudes of home gardeners. Perhaps because of the private quality of gardens--they are an extension of one’s home after all, they are more difficult to access and study than larger farms. As gardens become a promising alternative to the current food system, they may become the star subject of many a

---

study. What this data does is introduce home gardening in the US setting and give a foundation to further home garden studies.

**How many gardeners are out there? Raise a rake if you can hear me!** In 2008, an estimated 36 million households (31% of households), participated in food gardening. For the purposes of this study, food gardening includes growing vegetables, fruits, berries and herbs. The majority of these participants grew vegetables, followed by herb gardening, fruit trees, and growing berries. Although 31% of households is by no means a majority, it is still a significant proportion of participation in gardening activities. In terms of future participation, a total of 43 million households planned to grow food in 2009. Those households already active in food gardening plan on increasing the variety and quantity of the vegetables they grow as well as spending more time gardening. Other plans included sharing their home-grown produce with others, start growing fruit and vegetables, start in containers, and spending more or less money on their gardening projects.

**Demographics.** Who is it that participates in food gardening? In terms of demographic representation, home gardens attract a wide range of society. The majority of gardeners are college-educated women, age 55 and over. Ladies raise your rakes up high as women gardeners are ready to turn this food system around! Gender and gardens has attracted some attention from anthropologists. This merits further research.

**Gardener's motivations.** What are the motivations in growing one’s own food? According to this survey, there are many motivations. The top 5 motivations are “to grow better-tasting food,” “to save money on food bills,” “to grow better quality food,” “to grow food I know

---

6 NGA, 6.
7 NGA, 6.
8 NGA, 7.
9 NGA, 7.
is safe,” and “to feel more productive.”\textsuperscript{10} Interestingly enough, this study was conducted in 2008, during a time of economic recession, and the participants were asked how much of a motivating factor is the current recession or economic downturn. To this question, they received mixed responses, the majority saying not at all, others saying very much, or somewhat. As this article is now 7 years old, it would be interesting to evaluate these same perceptions years later. Are home gardeners more or less motivated to garden because of economic changes in 2015?

\textit{Location, Location, Location.} In terms of location, one would assume that most gardens are grown at home. This assumption is correct, with 91\% (33 million households) grow food at home.\textsuperscript{11} 5\% (2 million households) grow food at the home of a friend, neighbor or relative. Lastly, 3\% (1 million households) grow food in a community garden.\textsuperscript{12}

\textit{Show me the money.} A common argument made in the favor of gardens is that gardening can save you money. Is that really the case? Obviously, one’s garden is only as productive as the work you put into it—as is life—but what does the NGA survey have to say about this? The average garden measuring 600-square-feet produces an estimated 300 pounds of fresh produce worth $600.\textsuperscript{13} The average annual investment into the garden is a mere $70. This is to say that the return ($600-$70) is $530!\textsuperscript{14} Thus, US consumers could invest relatively little money into gardens and still yield a lot of fresh produce.

Another economic approach is from an individual, Roger Doiron, who reported a value of $2149.15 of produce that was grown during the growing season.\textsuperscript{15} The husband and wife team, measured the organic food produced by their garden and compared the cost of purchasing the

\textsuperscript{10} NGA, 9.
\textsuperscript{11} NGA, 11.
\textsuperscript{12} NGA, 11.
\textsuperscript{13} NGA, 12
\textsuperscript{14} NGA, 12.
produce at a conventional grocery store, farmers’ market and a Whole Foods. As for the couple’s investment in their garden, they spent $130 for seeds and supplies, $12 for a soil test, and $100 for organic compost.\textsuperscript{16} The author estimated an investment of around $282, including things like water bills. This suggests a return on their investment of 862\%.\textsuperscript{17} Doiron doesn’t estimate the cost of labor, because as he puts it, “we enjoy gardening!” Although Doiron is a devoted gardener, this is not going to be the case for every family or household who starts a garden. It does, however provide evidence of garden productivity and food savings that a family could have. Doiron states: “In the end it might come down to the language we use. Instead of saying ‘Honey, I’m going out to the garden to turn the compost pile,’ perhaps we should say ‘Honey, I’m going outside to do a ‘green job’ and work on our ‘organic stimulus package.’”\textsuperscript{18} Gardens are a great source of both personal enrichment and nutritional enrichment, and maybe to some extent, financial enrichment.

Another economic analysis provides different figures. They did a thorough literature review attempting to find cost-benefit analysis for home gardens. Home gardens are often recommended as a way to save money despite the lack of conclusive research behind these claims. What this author found was that gardens yielded an average to around $678- $515 worth of fruits and vegetables, profit above the cost of maintaining and constructing the garden (irrigation, seeds, soil, etc).\textsuperscript{19} The author estimates the supplies for a garden to cost around $238 on average.\textsuperscript{20} This figure excludes the cost of labor, when including labor, she saw that the profits went down. A major comment she had to make was that the yield and net value across farms was

\begin{thebibliography}{9}
\bibitem{16} Doiron
\bibitem{17} Doiron
\bibitem{18} Doiron
\bibitem{20} Langellotto
\end{thebibliography}
highly varied, although the cost of materials and supplies remained fairly consistent. The most profitable crops grown in gardens were tomatoes followed by leafy green vegetables.

Ultimately there will be a wide variance in how much gardens will yield, it all depends on the owner’s investment in the success of their garden. The author argues that the benefits of gardens “extend well beyond the potential financial benefits,” to encourage healthy eating, stress relief, and as a form of physical activity.\(^{21}\)

**What's Good to Eat.** Let us recall, vegetables are the most popular item grown in US home gardens. What vegetables are the hottest vegetables of 2009? If this was a more recent survey, I imagine we would see the trending “superfoods,” like kale on this list.

According to this list, the 10 most popular vegetables grown by home gardeners are: tomatoes, cucumbers, sweet pepper, beans, carrots, summer squash, onions, hot peppers, lettuce, and peas.\(^{22}\) Other vegetables that were runner-ups are pumpkins, watermelon, radish, spinach, broccoli, and asparagus. A major benefit of the home garden system is to supplement one’s diet with fresh produce. As evidenced by this survey, American home gardeners are keen on growing vegetables.

**Interest in Community Gardening.** This survey attempted to gauge the general interest in community gardening. Surprisingly enough, the majority of the households (51%) are not at all interested. A mere 3% are extremely interested in participating, and a small 4% are very interested in having a plot in a community garden near their home, translating to around 5 million households that would like to garden in a community garden.\(^{23}\)

\(^{21}\) Langelotto
\(^{22}\) NGA, 13.
\(^{23}\) NGA, 14.
**Reading, Writing, 'Rithmetic and Rutabagas?** The educational value of gardens is an indisputable “good.” Gardens, both at the household level, in the community, or at school are a valuable space to educate the young and the young at heart about healthy eating and healthy agriculture. How interested/aware is the American public in gardening in school? A majority of households say that gardening activities should be implemented in school whenever possible, 22% as an extracurricular activity, and 20% “whenever convenient.” A miniscule 3% think that gardening activities has no place in school whatsoever. In terms of general attitudes and opinions about kids and gardening, a majority believe that “teaching kids about gardening is good for the environment.” Other opinions were that “it is a good opportunity for experiential learning,” “gardening can engage children who are hard to reach otherwise”, and that it is a “positive experience that helps young minds develop.” What this suggests is that people generally believe that gardens are a great opportunity for education.

**Data Analysis.** This data is certainly interesting, as it approaches the home garden from varying perspectives--economic, education, sociological, etc. This study seems to understand the general perceptions of home gardens, the popular vegetables and the willingness/interest to engage in gardening. The major critique of this data is that it is most likely outdated and that it was funded by The Scotts Miracle-Gro Foundation. It is wise to further analyze this data and its way of collection from a critical perspective for any chance of bias. It just seems a little sketchy that a fertilizer company would be collecting such data. The National Gardening Association (NGA) is a nonprofit that is devoted to education and research about the garden industry. Based on the limited available data, this research is still valuable, as similar studies seem to be few and

---

24 NGA, 15.
25 NGA, 15.
26 NGA, 16.
far-between. What would this kind of data look like on a global level? Further research and more studies on home gardens would offer a more accurate image of gardening on the global level.

This data, although limited, provides a window into the current status of home gardens in the US. There are many benefits to owning a home garden that are alluded to through this survey. To better evaluate these benefits, the ecological economics approach will be utilized to better evaluate these benefits

**Ecological Economics.** A strictly economic evaluation of a garden would be incomplete. Ecological economics broadens the analysis to include aspects left out by standard economic analysis. This form of analysis provides a more complete picture of the benefits to humans sourced from the ecological system in question. Home gardens, although they are created by man, are part of a greater natural system. It is only logical to assume that they have benefits both for these natural systems and for the humans who create them.

Natural capital is “the natural resources and natural services that keep us and other forms of life alive and support our human economies”  

27 Natural capital can be broken down into natural resources (materials and energy that are essential/useful to humans), and natural services (natural processes that support life and human economies).  

28 In economic terms, “capital,” refers to money or forms of wealth that support a person, a population or an economy. It can provide a sustainable income if properly managed and not spent too quickly.  

29 By framing the environment in terms of its connection to human health, we can gain insight as to how our actions end up harmful to both ourselves and the natural systems we depend on. Industrialized agriculture is not sustainable; it uses synthetic fertilizers and pesticides,
conventionally and genetically modified seeds, depends on nonrenewable fossil fuels, produces significant air and water pollution and greenhouse gases, is globally export-oriented, and uses antibiotics and growth hormones in meats. An alternative to this system, organic agriculture; emphasizes prevention of soil erosion, uses organic fertilizers, employs crop rotation/biological pest control, doesn’t use genetically modified seeds, reduces fossil fuel use and increases use of renewable energy, produces less air/water pollution and greenhouse gases, and is regionally and locally oriented. Household gardens are a form of organic agriculture on the small-scale. Household gardens can be framed as a form of “natural capital,” for their contributions to the surrounding ecosystem and for human well-being. They can maintain topsoil and arable land. In addition to providing the positive of fresh, home-grown food, these gardens also serve as a point of contact between nature and culture.

Part of this conception of natural systems is the ecosystem service approach. “An ecosystem is a dynamic complex of plant, animal and microorganism communities and the nonliving environment interacting as a functional unit.” Ecosystems include both natural systems as well as developed areas, like agricultural fields and urban areas. Ecosystem services are the services that these ecosystems provide to human beings. The categories of ecosystem services are provisioning services, regulating services, cultural services, and supporting services. Provisioning services directly support human existence in an evident way. Regulating services are the elements that affect climate, floods, disease, wastes, and water quality; the things that

30 Miller, 277.
31 Miller, 277.
combine to create a habitable environment for humans. Cultural services are the recreational, aesthetic and spiritual values obtained from an ecosystem.\textsuperscript{33}

**ECOSYSTEM SERVICES**

**Provisioning services:** Food, raw materials, fresh water, medicinal resources

**Regulating services:** local climate and air quality regulation, carbon sequestration and storage, moderation of extreme events, waste-water treatment, erosion prevention, maintenance of soil fertility, pollination, biological control of pests and vector borne diseases

**Habitat or supporting services:** habitats for species, maintenance of genetic diversity

**Cultural services:** recreation and mental and physical health, tourism, aesthetic appreciation and inspiration for culture, art and design, spiritual experience and a sense of place.\textsuperscript{34}

The relationship between ecosystem services and well-being can be seen in the chart.

\textsuperscript{33} Millennium Ecosystem Assessment

\textsuperscript{34} Millennium Ecosystem Assessment, v.
What is emphasized here is that home gardens are part of a greater conversation of human dependency on natural systems for the maintenance of well-being. The provision of these ecosystem services is essential to living well.

**Case Studies: Latin America and the Catalan Pyrenees.** The main examples of home gardens in this chapter will be Latin American and the Catalan Pyrenees. Although the benefits of these two gardens are specific to these regions, there is a lack of research on the general benefits of gardens. Ideally, one can surmise these benefits in their own region. Although these benefits are varied depending on the location and regional areas, one can still analyze them as important.

**Ecological benefits.** Home gardens, although they may be small and created by humans, form part of a greater ecosystem. Despite being a human manipulation of the natural environment, they can contribute in unique and surprising ways to conservation of natural species. In a study of Latin American home gardens, a correlation was found between “home garden hot spots” and biodiversity hotspots, especially considered at a regional scale. The potential of conservation depends on the plants that are chosen in each garden, if they are native or non-native. As the household garden is highly variable, those that more closely resemble their natural surrounding natural environment provide greater environmental benefits than those that resemble large-scale agricultural projects.

Home gardens can be a “home” to endangered species. In both Honduras and in Merida, Mexico, certain plant species are now only found in home gardens although they previously were common species that populated the region. Home gardens can also provide a habitat for species, aiding in species conservation. One example of this is that of migratory bird species in

---


36 Pulido, 10.
Belize. For these birds, the gardens serve as both habitat and as a food resource, because of the limited options in the region.

In the Spanish Pyrenees, home gardens serve various ways of maintaining the greater natural systems that they form part of. The authors divided these services into two main categories: regulating and habitat/support. Regulating is the “maintenance of essential ecological processes and life support systems.”\textsuperscript{37} In the Pyrenees system, these benefits include flood prevention, when the gardens are located near rivers; the maintenance of soil; weathering of rock; accumulation of organic matter that enhances fertility pollination thanks to enhanced crop production, bioremediation and enhanced water quality; population control through trophic/dynamic relations, and prevention/buffering of pests and diseases.\textsuperscript{38}

The category of “habitat/support” refers to the provision of habitat for wild plant and animal species and maintenance of biodiversity. Home gardens can provide suitable living space for wild plants and animals. Secondly, they contribute to the support of biodiversity by gene pool protection and the maintenance of landraces.\textsuperscript{39}

\textit{Cultural benefits.} In the case of the Catalan Pyrenees, the gardens provide aesthetic values, a recreational hobby in a culture that has historically practiced small-scale agriculture, and a place for inspiration for artistic values. Gardens, as a space manipulated by humans can be manipulated to reflect cultural values. They can be spaces for worship and decoration. This will be explored further in the chapter about anthropology.\textsuperscript{40}


\textsuperscript{38} Calvet-Mir, et al

\textsuperscript{39} Calvet-Mir, et al

\textsuperscript{40} Calvet-Mir, et al
**Psychological benefits.** In terms of psychology, gardens provide both a recreational space as well as a green space to do one’s own work in. In the Catalan Pyrenees, garden owners positively commented on the presence of gardens in their homes as spaces to connect with their spiritual feelings as well as a place to admire nature. On a broader scale, in accordance with the biophilia argument, home gardens are part of a greater story, one in that humans benefit psychologically from being in contact with nature.\(^{41}\)

**Educational Benefits.** Home gardens, because of their connections with cultural practices of gardening, are often educative spaces. There is a key transmission of generational knowledge in the garden.\(^{42}\) In both Latin America and the Catalan Pyrenees, adults can share their cultural gardening practices with the younger generations.\(^{43}\)

**Economic Benefits.** Home gardens are economically productive spaces. The produce grown by households can be sold on the market, or sold to friends and family. They can be beneficial in terms of the money saved by shopping in one’s own garden instead of going to the supermarket or buying from a local vendor.

In the case of Latin America, home gardens can generate a significant income for the home, oscillating between 10-100%.\(^{44}\) “Other indirect contributions that exist are satisfactory materials, which lessen market variations because the gardens are productive throughout the entire year and evade making purchases for products found in the garden. They balance the necessity for gain and subsistence as well as creating connections in the community because of the products that are gifted or traded.”\(^{45}\)

---

\(^{41}\) Calvet-Mir, et al
\(^{42}\) Pulido
\(^{43}\) Calvet-Mir, et al
\(^{44}\) Pulido
\(^{45}\) Pulido, 17
**Other Benefits.** Home gardens are dynamic spaces where social interactions and family bonding can occur. Interestingly enough, home gardens can be an “indicator” of “adaptation capacity to social, economic and cultural changes.” Home gardens can be used to evaluate how populations react to market changes in terms of both their socialization in the garden as well as their subsistence practices. In Pulido’s study, gardens are a place for knowledge exchange, driven by women. Women form networks and share information about species and garden management, “part of physical and cultural capital that is transmitted between women and their descendants.” Home gardens can “create and enhance social networks.”

What this analysis provides is that household gardens pack a big punch. In terms of their relative small size and position as a “secondary” source of income. They provide a wide range of benefits.

**Chapter 2. From Subsistence Gardening to Industrial Agriculture**

“*Eating is an agricultural act*” - Wendell Berry

If there is one thing that history has taught us, it’s that humans have always depended on food. There is no society that has ever been successful without a food system. When Berry calls eating “an agricultural act,” he highlights the power of the eater to alter the system of agriculture. The way that we eat is telling of what kind of system we support. Eating homegrown food supports small-scale, sustainable agriculture. Eating from supermarkets only supports the current food system.

Many different plants that come together to create a home garden. This chapter combines various narratives and related histories to gain an understanding of home gardens over time.

---

46 Pulido, 12
47 Pulido, 13
48 Calvet-Mir, et al
What this chapter presents is the evolution from subsistence agriculture to today's complex system of monoculture and exploitation.

Current Prognosis: A Bottleneck. Today’s food system can be described as a bottleneck. This shape means that there are a lot of producers and consumers, but a bottleneck in the distribution chain. This bottleneck places the power in very few hands. The system of food that we have connects food from great distances with consumers and supermarkets across the world. In this system, “you need to be rich to play this game.”

Because of the scale of the food system economy, these large distributors pay very little to be in business. Small scale operations face great economic difficulties. In this system, the success of large companies is guaranteed, where the small-scale producers are “devoured,” by the “Leviathans of distribution and supply.”

Essentially, the system works against small-scale producers in a profound way.

Wandering down today’s grocery store aisles, one sees images of idyllic scenes of farmlands and cute animals on the packages of food products. The reality of large-scale monoculture is a big departure from this ideal. Through changes brought about by colonialism, globalization and agricultural policy, particularly the Green Revolution, agriculture has changed from the small-scale subsistence agriculture to the “bottleneck” it is today.

There was an initial revolution around 10,000 years ago when humans shifted from hunting and gathering food to the dawn of agriculture. Today’s version of agriculture sharply contrasts that of 100 years ago. This system is monoculture because it produces a small variety of crops. “Of the estimated 50,000 plant species that people can eat, only 14 of them supply an

50 Patel, 11
51 Patel, 11.
estimated 90% of the world’s food calories. Three crops--rice, wheat and corn--provide about
48% of the calories that people can consume directly."\textsuperscript{52}

Industrial/high-input agriculture is a system that uses heavy equipment, large amounts of
financial capital, fossil fuels, etc. The major goal of this system is not to provide healthy,
adequately priced and distributed foods to the world population, but to increase the yield of each
crop. This system has serious environmental impacts, such as biodiversity loss, erosion/loss of
soil fertility, water waste, aquifer depletion, air pollution and human health.

Food isn’t meant to make us sick. The prognosis of this system is bleak. It manages to
both underfeed and over-feed significant portions of the world population. How did this system
evolve over time? What has been the place of the “household garden” throughout these historical
changes?

\textit{Evolution through American Agriculture} “America’s agricultural history is not a story of
continuous progress or moral certainty. Because it is a story of human actions over time and in
the context of culture and place, it has been shaped by the best and the worst of human nature.”\textsuperscript{53}
What this statement reveals about agriculture is that it is more than the simple act that it seems. It
is a reflection of a culture’s relationship with the earth, a culture’s culinary and gastronomic
identity, and that same culture’s politics of land management and economic policy. Throughout
American history, agriculture has formed part of the nation’s identity. As previously stressed, no
nation in history has been successful without \textit{food}.

Although it wouldn’t be accurate to say that farmers of today aren’t concerned with their
own subsistence, the primary goal is making profit. What has changed in the past century has

\textsuperscript{52} Miller, 281.
\textsuperscript{53} Hurt, Douglas. \textit{American Agriculture: A Brief History}. Iowa State University Press. Ames, Iowa. 1994. viii
been the extreme focus on farming for profit manifested as the “bottleneck” food system of agribusiness. Were farmers always as profit-motivated historically, just lacking the technology and capitalist support system to achieve great profits?

It is easy to romanticize the image of the pioneer farmer as a simple man or woman looking to provide for their family and live off the fat of the land. There is some debate over whether the farmers before the 20th century were subsistence or commercially oriented or both. Most would agree that their motivations were a mix of both subsistence and commercial profit, certainly not profit-centered. Prior to the early 20th century, subsistence was at the core of the goals of farmers. Farmers sought to provide for their families and to be as self-sufficient as possible. This was not the days of supermarket produce readily available, so it was really in one’s interest to have a productive farm of their own. As times changed, and the political and economic climate changed, pursuit of profit slowly overrode the goals of self-sufficiency and subsistence of farmers. “Commercial gain, which requires farming for profit, has dominated the thoughts, goals, and endeavors of most American farmers throughout the nation’s history.”54 Despite the romantic image of the pre-20th century farmer as a quaint lifestyle of peaceful subsistence farming, the foundation for the system of agribusiness and pursuit of profit above all was being laid.

Prior to the colonial period, Native Americans had their own agricultural projects throughout the regions they inhabited. Native Americans had been farming since 5000 BC.55 These varied projects were each suited to the environmental conditions of their region, often mixing crops, and making genuine agricultural achievements, such as extensive irrigation.

---

54 Hurt, ix.
55 Hurt, 3.
systems in the Southwest. One could argue that the agricultural practices of the various Native American communities could keep up with any sort of organic farming technique of today. They made site-specific agricultural practices that worked in harmony with natural systems.\(^5^6\) Upon the arrival of the colonists, this all changed. These traditional, site-specific techniques were traded for European style farming. Agriculture was central to the economy of these colonies. This is essential because it was the first introduction, the foundation of farming for profit. These colonial farmers “developed a commercial mentalité,” making commodity crops for market sale on the domestic and international level.\(^5^7\) The farming techniques practiced varied, some practicing crop rotation or manure for fertilizer, but most farmers had a profit-driven model of farming. These colonial farmers are characterized by their “carelessness,” and always were “governed by the potential for economic gain.”\(^5^8\) As the profit-driven agricultural model grew, so did their agricultural projects, creating plantations and promoting the expansion of commercial crops. This model spread, leading to the formation of the slave labor system, soil exhaustion, political and social elitism and ruthless speculation.\(^5^9\)

A brief departure from this capital-driven agriculture is the notion of agrarianism as inspired by Thomas Jefferson.\(^6^0\) This was an ideal that farmer’s had the best way of life, provided they lived off the land and farmed for subsistence. As the US became increasingly urban, cities became envisioned as landscapes of moral decline, bad behavior, and not fit for wholesome family life. This romanticized the rural life. Although this ideal ultimately proved to be more fact than fiction, as the family farm lost the battle to the big plantation owners, who certainly had

\(^5^6\) Hurt, 32.
\(^5^7\) Hurt, 35.
\(^5^8\) Hurt, 37.
\(^5^9\) Hurt, 69.
\(^6^0\) Hurt, 72.
some questionable morals of their own. The moral ideals behind agrarianism have been important historically and politically. “Thus while the agrarian tradition initially meant that the farm provided more than the bread alone, agriculture in the late twentieth century often did not furnish enough food for sustenance or ensure economic viability. Small-scale, family-farm agriculture declined as a fundamental industry.” 61

As the nation struggled for independence from Great Britain, the agricultural industry started changing. Jefferson pushed for a diversification of agriculture; both coming from his own agrarian ideals and a desire to break from the commodity farming system that fed the colonial powers tobacco and other cash crops.62 Farming practices stayed fairly intact during the Revolutionary era, most farmers actually profited, as the war offered them an economic opportunity and a lack of governmental regulation.63

After the war, subsistence agriculture was still popular on the frontier areas, whereas commercial farming dominated the more settled areas.64 Throughout the US, many struggled to be self-sufficient and meet their subsistence needs. Although individual families could be self-sufficient to an extent, “only through commercial agriculture could they improve their economic condition.”65

As the Antebellum period started, “large-scale commercial agriculture would dominate the American economy.” 66 The rapid developments and push into commercial agriculture also included a new pattern of land settlement, a race towards areas of land best-suited to large-scale commercial agriculture. “Above all, antebellum agriculture reflected the great differences in

61 Hurt, 77.
62 Hurt, 79.
63 Hurt, 85.
64 Hurt, 113.
65 Hurt, 114.
66 Hurt, 114.
America regarding race, class and gender.\textsuperscript{67} The Civil War brought diffusion in labor and technological revolution to the north. It was at this time that focus was shifted from self-sufficiency to the production of commodities, as well as a mechanization of agriculture.\textsuperscript{68} As a result of the movement of people, changes in agricultural techniques, and continued march towards progress and profit, the next level in the foundation of today’s agribusiness was set into place.

In the Gilded Age, wealth was proven to be a “veneer” over the problems and poverty facing Americans. As economic growth continued, the first two decades of the 20th century were the best time to be a farmer. Farmers finally had a purchasing power that equaled/exceeded that of other work. This wouldn’t last long. With the arrival of WW1, farm prices rose dramatically.\textsuperscript{69} As the advances in technology continued, farming became more varied, but continued to exploit others for their economic success. “Farmers often wrung great profits from the land, but with high prices in dislocation, misery, and despair for those who had neither land nor capital to survive hard times.”\textsuperscript{70} After this, times got very rough for farmers with the onset of the Dust Bowl and Great Depression. Mechanization was continued, and the federal government acted as the keeper of the keys in controlling what the farmers grew. Farmers looked to the government for support, but still felt constraints economically. Because of these challenges, farmers left, and as they left the countryside their political power began to decline.\textsuperscript{71} The next period of “days of uncertainty,” involved a decline in young people taking over the farming profession. Rates of urbanization increased as the economy became more

\textsuperscript{67} Hurt, 117. \\
\textsuperscript{68} Hurt, 165. \\
\textsuperscript{69} Hurt, 221. \\
\textsuperscript{70} Hurt, 276. \\
\textsuperscript{71} Hurt, 329.
specialized. At this point, very few people rely on their own farming at a household level for the food they eat. Young people sought an education and a white collar job as motivated by cultural changes and the specialized economy—where movement away from farming jobs or other “blue collar” jobs marked progress and upward mobility. “While the agricultural population dropped to less than 2 percent of the total population, however productivity remained strong.”72 In this period and the time that followed, technological innovation was the name of the game. Increased advances in the technology of pesticides and farm equipment lead down the road to create the industrial farms of today. This is part of the last revolution of agriculture--GMOs and biotechnology. Both of these forms of progress, chemicals (from the Green Revolution) and GMOS have been proven to cause ill effects.

As these technologies rise, the amount of population that is farming goes down, as does the amount of people involved with the management and control of the food industry. Here we see the bottleneck food industry fully-formed. What becomes most clear through the historical analysis of American agriculture is the change in orientation and motivations to farm. Through the evolution of the agricultural industry, profit went from being a motivation to being the exclusive motivation for today’s farmers.

**History of Gardens.** The kitchen garden, as previously defined is not the primary source of income for the family that cares for it. It is a secondary source of income and often a hobby or something practiced generation after generation. This is what distinguishes the home garden from the kind of agricultural model discussed in the last section. Profit is never the primary motivation.

---

72 Hurt, 332.
The home garden operates on a much smaller scale as compared to the previous systems. How can one approach the history of the kitchen garden? A garden seems to be something that can only be viewed as existing now, or existing through the seasons, but it has deeper roots. It is both an important cultural institution and practical source of food yesterday and today. From the Garden of Eden to today’s urban gardens, the garden has been relevant throughout history and will continue to become relevant as the general public becomes increasingly critical of contemporary agribusiness.

What are the origins of the practice of cultivating these small-scale gardens close to the home? In Western Europe, this practice can be traced to origins in Egypt, Persia, Mesopotamia and Babylon. These early gardens were both a sensory experience as well as a productive space to grow dates, figs and pomegranate trees. These spaces were a “royal playground,” where Persian kings could enjoy nature and hunt recreationally. The form of these gardens that served to inspire later European gardens was “four quadrants with a water source in the center.” These gardens were unique spaces that served as an oasis, to escape from the unforgiving desert that surrounded them.

In a different climate, Rome, the peristyle style of gardening was popular. This is a departure from the Persian “oasis” style gardens, as these were a special area within the walls of the house, a central patio with rooms surrounding it. This garden was “the foundation of Roman family life, where they entertained, rested and placed representations of their deities.” The Roman style of garden was replicated and influenced both Islamic gardens and the cloisters in Monastic gardens.

---

74 Bartley, 21.
75 Bartley, 22.
If the Roman gardens were a grounded center to family life, the Islamic garden was the representation of earthly paradise. The goals in creating this garden were religious in motivation: by creating this perfect garden paradise, humans can get closer to God and the Garden of Eden.

The main distinction to be drawn from the Eastern and Western forms of gardening is this: the Eastern garden is the oasis; the western archetype is of the clearing. The landscape in these two areas is drastically different, which played an important role in determining what can be planned. However, although they are both different, these two traditions create a sense of a haven and refuge. This is the case for many contemporary gardeners, who see their gardening hobby as a way to escape their busy lives.

In the Middle Ages, another “heavenly” demographic takes over the gardening scene---the monasteries. “The words yard, garth, garden and the French jardin all come from the same Indo-European root word gher, meaning to grasp or enclose.” During the Middle Ages, the enclosed garden became the standard. It is depicted in many tapestries from the period. It is a space to enjoy some recreation. This kind of garden is best exemplified in the monasteries of the early Middle Ages. The Monasteries are their own communities, and food production was required of the monks to sustain themselves. In addition to this, the monks had duties outside of their faith to manual labor as well. Because of their isolation and quality of gardening techniques, “within the monastery walls a heritage of plants was preserved.” In this style garden, vegetables and fruits were laid out in geometric forms and fully tended by hand. In an early manifestation of “farm-to-table-cuisine,” the cooks in the monasteries consistently pulled fresh produce from these gardens

---

76 Bartley, 23.
77 Bartley, 24.
78 Bartley, 25.
for their culinary creations. Today, the concept of “farm-to-table” cuisine is becoming increasingly popular. These early monastery gardeners were on to something!

There isn’t concrete evidence of these gardens, much of what we have learned we have learned from illustrations and manuscripts. One of the better examples is the plan of the garden of Saint Gall in Switzerland. Although it was never built, this plan contains the typical qualities of the garden it proposed. Within the walls of the monastery, there is a kitchen garden, as well as other gardens devoted to medicinal plants, a cloister garden, and an orchard used as a burial garden. The gardens had symbolic meaning. It is facing the south to be able to access much of God’s light. In the center is a fountain of water, which divides the garden into four parts, each of which representing the “four rivers” flowing from the Garden of Eden, and the cross on which Jesus was crucified. In this plan, the kitchen garden is a raised bed style garden, located next to poultry barns. This is an early form of fertilizer and a technique of maintaining soil quality as well as keeping food sources close together. In the orchard, the space was used to grow fruit and nut trees, such as almond, mulberry, peach, walnut and plum.  

Another piece of historical evidence of these gardens comes from Charlemagne. He made a decree, the Capitulare de Villlis which called for crown lands in every city to have a garden planted with herbs in addition to fruits. This decree included a list of the plants necessary to be grown. Although it was primarily vegetables, fruits, herbs and medicinal plants, also included are the rose and lily, two symbolic flowers important to the church. This in an interesting instance of early agricultural policy, certainly tame in comparison to today’s agricultural policies.

---

79 Bartley, 27.
As history progressed, so did gardens. The transition from these monastery gardens to Renaissance gardens can be conceived as a change in scale. “The garden behind the wall became larger, more elaborate.” The growth of a middle class created an alternate land use pattern consisting of large plots of private land. On each of these manors, the gardens were changed and conceived as an extension of the house. This occurred in French landscapes. Meanwhile, in English landscapes, the garden was downgraded to a utilitarian tool not meant to be visually pleasing. It “was not the fashion of the day to see the ‘messy’ working day.” The two differences between the garden in the French countryside and English countryside can be linked to later differences in cuisine and in gardening styles. Today, something wholly French is the potager garden, which is a small-scale kitchen garden, cultivated year round and appreciated for its nutritional and aesthetic contributions to the home. This kind of garden is a household garden, still common in France today and similar to other small-scale, organic kitchen gardens.

Linking Histories. What is presented in this chapter is an account of two different forms of agriculture: small-scale home gardening and large-scale agribusiness. Because of their smaller scale and more intimate nature, home gardens do not have the same complex history of changing motivations, changing agricultural techniques and usage of technology as large-scale gardens. Home gardens are not a primary source of income, and made for subsistence purposes, for recreation, or for aesthetic value. What is most important to draw from the history of American agriculture is the move from subsistence to profit-driven farming. The drive to profit is the thread connecting through America’s agricultural history, ultimately pulling it through to its current manifestation of profit-worshipping agribusiness.

80 Bartley, 29.
81 Bartley, 29.
Chapter 3. “Do You Need a Husband to Start a Garden?” – Cultural Meanings of Home Gardens

In the rural community in Monteverde, Costa Rica, a group of women were asked what was necessary to start a garden. One woman, in all seriousness said: “A husband!” The other women laughed and began sharing stories of their own gardens and the way that the garden brought their families together. Although husband is certainly not a necessary ingredient for a successful garden—he just may be a hindrance depending on who you ask, this woman’s answer reveals something important about the role of a home garden in her own culture and life experience. Home gardens aren’t viewed as a mere patch of dirt and plants, but can be important places, a storehouse of meaning and memories to individuals and families.

Recalling back to the initial definition of gardens--gardens are defined by their function as opposed to their form. These small gardens form part of the home, and are linked to the formation of an identity and a sense of belonging for individuals and the community. Besides that, food is often linked with culture and home gardens as a productive space for food. There are differences in form in the gardens owned by different cultures. For example, a garden that is maintained by a Mexican family in Monterrey will differ in terms of the plants grown, shape, etc than a windowsill garden maintained by a grandmother in her apartment building in Chicago. However, despite these cultural differences, there is universality in the garden experience. This universality is connected to greater claims of biophilia and a need to feel “rooted” in one’s

---

82 Research Experience for Undergraduates (REU) Site, Globalization and Community Health: Combining Social Science and Engineering, National Science Foundation award #1156735. N. Romero-Daza, PI and D. Himmelgreen, Co-PI, Department of Anthropology, University of South Florida

culture and place. This “universal experience” is an “encounter with nature that produces tangible outcomes and engages the senses.”\textsuperscript{84} Authors Gross and Lane describe the garden as a “work of human agency, a very personal act steeped in emotion, family history and self-identity.”\textsuperscript{85} The garden, as an extension of the home may be a place for intergenerational interaction of families, a place for education and for a simple break from the stress and rapid pace of everyday life. The home is a clear cultural space of importance, central to human needs -- both in terms of subsistence and social relationships and personal identity. The garden is an external feature of the home, and a space for productivity and “place-making” activities. The garden is a place for productive work, as well as a place to own. Plus the garden develops over time, so becomes important across generations. Interestingly enough, in interviews conducted with owners of gardens, many commented on the developmental role of gardens to their own lives. Children are attracted to gardens. The children plan out their own future dream gardens while learning and playing in the gardens of their parents or grandparents. Adults often fondly recall these memories when working in their own gardens of their own homes. Gardens are a place for escapism in childhood--as a space for imaginative play and dreaming of “future gardens” and in adulthood--a place to connect with nature, be in control of a productive process and escape from the anxieties and stress of the modern world.\textsuperscript{86}

\textbf{Notions of place.} An interesting population to study in terms of their cultural attachments to gardening is the immigrant population. In a study of Southeast Asian and Iranian immigrants
in Southern California, gardens were found to be important spaces in terms of culture. The act of immigration is a jarring experience, no matter what socioeconomic background one comes from, no matter what the factors are surrounding the person in question. As humans we form attachments to and identities from the places and spaces surrounding us. Immigration is a move from one place to another. It is common to feel disoriented and alienated upon moving to a new place, because one has lost their “material anchor,” connecting them to their own cultural identity and conception of self. For these immigrant communities, gardens can serve as a way to create a little bit of home in their new space.

Similar to Gross and Lane’s argument about childhood and adult experiences of gardens, gardens are a “container of memory” of one’s homeland. Gardens are a significant space from which one can draw meaning. Memories can become attached to the odor of a certain plant, the gazebo that looks just like one’s grandma’s gazebo, and that place where I used to always play in the dirt before dinner! “Past memories of favorite childhood gardens spill over on to present and ideal images of gardens.”

Beyond these childhood ideals, gardens can be very reflective of culture and culture change in immigrant populations. Gardens for families who practice Hinduism and Buddhism can be a meditative sacred space, with altars and statues among the plants growing. For certain families, gardens can be divided into their “American” garden and the garden representative of their homeland. Certain families have their front yard “Americanized,” with the typical foliage that characterizes suburban American front yards. Meanwhile, the backyard is “a different story.”

87 Mazumdar, Shampa and Sanjoy “Immigrant Home gardens: places of religion, culture, ecology, and family” Landscape and Urban Planning, 105.3. 15 April 2012, 258-265
88 Mazumdar, Shampa and Sanjoy
89 Mazumdar, Shampa and Sanjoy
The backyard is where one would grow plants found in their homeland that aren’t available in the average market, that form part of their cuisine.90

Other usages of these spaces are the growth of medicinal plants. The practice and growth of medicinal plants is common throughout many cultures, and again, not something that is readily accessible in the average American supermarket. Others may grow ornamental plants from their homeland for sentimental reasons...to bring a little bit of their own landscape to the new landscape they inhabit. The growth of these nostalgic and culturally relevant plants forms a bridge in these communities between the place they left behind and the new place they inhabit. “To be human is to live in a world that is filled with significant places.”91 Humans don’t bump about blindly in the world, and one’s own surrounding ecological conditions influences their cultural practices and identity in a profound way. The “ecological space” of the home garden for these immigrant families is a meeting place between the environmental nostalgia of their homeland, an important store of memories, and a means of connecting with one’s new environment.

**Cultural Roots.** The notion of cultural identity and the natural and built environment are two tied up notions. People draw meaning from their environments, be it a spiritual, personal, or cultural meaning. The garden is a special place in terms of the practice of “place-making” because it is productive and a place for the harvesting of produce that is significant to one’s culture and of social capital.92 In the immigrant gardens of the study, the social nature of the home garden was important. Not only were the gardens studied to be a space for the family that

---

90 Mazumdar, Shampa and Sanjoy
91 Mazumdar, Shampa and Sanjoy
92 Mazumdar, Shampa and Sanjoy
maintained it, but a place of connection with the local community. Produce was shared among neighbors from similar cultural backgrounds, providing a common space to exchange culturally relevant produce and to form connections with like individuals dealing with the same stresses of assimilation and knowing a new culture. So, the garden can be a tool to generate social relations with this community, which is integral for a happy life in the new homeland! In terms of the family itself, the gardens can be a place for older generations to teach newer generations about the important crops from their own homelands. As younger generations become further assimilated into the new culture, this is a place of cultural grounding to know one’s “roots” so to speak. What is most interesting is that the home garden is simultaneously both a place to identify with one’s homeland and stay connected with their culture of origin, but also a way to form relationships and identities with their new environment and home.  

*Changing Gardens, Changing People.* In a similar study on the role of Latin American home gardens, the garden has been studied as a marker of change and adaptability in Latin America. Home gardens are common throughout much of Latin America yet have not been studied in great detail. Gardens in Latin America, as is true across most of the research conducted, are places of social interaction. In the garden, the family interacts and exchanges plants and information. These gardens are a place to share knowledge across generations, and the kind of knowledge/ability to maintain the garden that each demographic possesses reflects factors like age, gender roles and differences in learning opportunities. Women are typically the heads of the garden, and it has been noted that knowledge of these garden management practices increases with the age of the landowner. The garden forms a “knowledge market” in a sense,

---

93 Mazumdar, Shampa and Sanjoy
94 Pulido
where women form networks to discuss gardening techniques and best practices for success in their own gardens. This “knowledge market” is a way to be more resilient--how to maintain one’s knowledge and cultural practices during change processes. Similar to the immigrant families studied in the previous case study, the garden is an important space to form networks of communication and to share knowledge from family to family, from individual to individual.

Although the author admits that little about the process of cultural change and gardens has been studied, it can be said that human actions in the management and care of the home garden are affected by external elements that “conform culture.” “From the small farmer perspective in Latin America, the HG is an integral space in their lives that is valued and continues to be an important structure, even in adverse economic conditions. Culture is reflected in garden structure, as in species selected and their associations.” In the Latin American context as in the North American context, immigrant families have a unique interpretation of the garden as a place to recreate their former landscape while adapting to their new landscape. For example, Japanese families who have migrated to certain regions of Brazil form a unique blend of Japanese plants and the local foliage. Also, the home garden changes based on the social status and the cultural background of the family who maintains it. Latin America is filled with countries with many diverse groups. Indigenous people will select different plants than non-indigenous people. Also, people of a higher social status were found to have more trendy ornamental plants in their gardens as opposed to their counterparts of a lower social status. This can fit into a greater dialogue of the influence of globalization on the plants selected for the gardens. One can imagine that families seeking to emanate a more “cosmopolitan” vibe will seek ornamental, non-

---

95 Pulido
96 Pulido, 14.
native plants. Meanwhile, lower-income or indigenous communities will choose plants for more pragmatic reasons—medicinal plants and plants they use in their cooking.97

**Preserving Traditional Diets.** The produce made by home gardens can also be studied in terms of the maintenance of traditional diets. Food is certainly linked with culture. Often, merely the name of a country can conjure images of iconic dishes. Food and culture are indubitably linked. Where do home gardens fit into this picture? Home gardens are typically the source of the important native plants and species that create the famous diets and plates that are associated with certain cultures.

Because of globalization and changes in the world agricultural system, diets are slowly becoming homogenized. Despite the important connections between heritage foods and cultural identity, the food industry is selling the “Western diet” of processed foods and white grains across the world. The industrialization of agriculture and the formation of the global food system has pushed the consumption of these foods over one’s “heritage foods.” These heritage foods are important because of their connections to the region that they are grown in and the fact that they have been sustaining human populations for the majority of history. In addition to the lost cultural value, these lost heritage foods are also a loss in biodiversity.98 As stated in the Millennium Ecosystem Assessment, biodiversity supports human well-being through the provision of important services: provisioning, cultural, supporting, and regulating.99 This biodiversity, as part of heritage diets, has been sustaining humans for so long and can continue to

---

97 Pulido
98 Millennium Ecosystem Assessment
99 Millennium Ecosystem Assessment
sustain new populations, “holding the technical and cultural keys for resilience.”\(^{100}\) By ensuring that we have options, biodiversity is a “winning card” because “options increase our resilience.”\(^{101}\)

**Chapter 4. Current Gardening Developments -- a Tour of Today’s Sustainable Gardens**

A home garden is a piece of landscape design. As a part of the environment that is influenced by humans, there is an element of design in the production of these gardens. Just as the system of agriculture uses design to shape the fields of corn, so does the home gardener and community gardener when designing their yard garden. A garden is only as sustainable as the design that goes into its creation. What distinguishes a sustainable home garden from an unsustainable home garden is the design. Through a discussion of sustainable design principles, and examples of garden designs, this chapter provides practical knowledge of garden design.

“If you are a poet, you will see clearly that there is a cloud floating in this sheet of paper.” Thich Nhat Hanh, a prominent figure in Buddhist philosophies breaks down the concept of “interbeing” -- a complex notion of interdependence. According to the concept of interbeing, something as simple as a piece of paper is much more than a piece of paper. In a piece of paper there is evidence of all the complex factors that are needed to combine to make this paper become paper--clouds, sun, trees, the logger that cut down the tree, the paper factory and its employees...the list goes on. This form of seeing the world reminds us that we are interdependent.


\(^{101}\) Cobb, 173.
and fits in well with the concept of sustainability.\textsuperscript{102} From the seed to the plate, the industrial food system is strikingly unsustainable, as it is totally dependent on nonrenewable energy every step along the way. It is estimate that it takes an average of “10 petroleum calories to produce just 1 food calorie.”\textsuperscript{103}

A garden is only as sustainable as its design. In order for these gardens to form part of the dialogue around sustainable agricultural futures, they must incorporate the techniques of sustainable design. Ecological design is “any form of design that minimizes environmentally destructive impacts by integrating itself with living processes.”\textsuperscript{104} The theory behind this kind of design is that natural systems and living processes really know what they are doing. There is wisdom in these natural systems that we blatantly ignore in most human decision-making and design choices. According to authors Ryn and Cowan, there are 5 main principles to sustainable design. These are that solutions grow from place, ecological accounting informs design, design with nature, everyone is a designer, and make nature visible. The first principle is about the importance of making choices for the local scale, because of all the specific things to find at this scale. The second solution refers to thinking of environmental problems in a more complex way. One should make decisions taking into account more than the traditional form of accounting, but envision issues in terms of their impacts on natural systems and human beings.\textsuperscript{105}

Today’s agricultural system is a broken complex system that places focus on the maximization of profit over any other concern. Ryn proposes human scale solutions to large-scale


\textsuperscript{103} Denckla Cobb. 199.

\textsuperscript{104} Ryn. x.

\textsuperscript{105} Ryn.
problems. “At a large scale, basic issues become imponderable puzzles...When we return to the human scale, these problems begin to resolve themselves...Design is accountable to place when we can read the consequences of our actions right on the landscape.” Applying this methodology to a home garden means that these gardens can be used to solve some of the problems of the contemporary agriculture system.

Reflecting back on the interdependence illustrated through the paper and clouds example, by being aware of these processes, we can make design decisions that are healthier for ourselves and for our planet. By approaching environmental impacts as not just “current” events but as a process that is influenced by human action over time, “we are led to examine the entire histories of the things we use.” Understanding things in terms of the processes and natural systems that were involved in, jeopardized by, harmed by, benefitted by their production is what will lead us to a better way of going about things. The important questions to ask along the way while doing this kind of analysis are “What was sacrificed to create it? What are the potential harms to humans and nature caused by its creation…that is we have to ask very hard questions of the economic process and we have to apply human and ecological values.” This is a form of “life-cycle analysis,” which is to say it looks beyond the immediate to the greater causes of the issue at hand. This is a form of “ecological accounting;” the same kind of analysis in the first chapter of this thesis. Home gardens, are part of the greater natural systems and processes that happen around them. Ecological accounting should inform design decisions.

---

106 Ryn, 99.  
107 Ryn, 100.  
108 Ryn, 112.  
109 Ryn, 112.  
110 Ryn, 112.
Great, this is a nice thought, but how can this relate to home gardens? By analyzing the agricultural system through this framework, we can imagine cleaner alternatives as well as be critical in a more thoughtful way of the current state of affairs. The kind of understanding attained through an analysis of this kind is very valuable and a deep level---the impacts that are incurred over a life-cycle, the socioeconomic implications, the ecological implications, and the beneficiaries and those taken advantage of by each choice made. Peter Bahouth is a director of the Turner Foundation, and did this kind of analysis in a really interesting way, by detailed analysis of the life-cycle of the average North American tomato, addressed to “nervous eaters,” called “The North American Regional Report, or the Attack of the Killer Tomato.” In this report, Balhouth brings the tomato from its birth on a farm in Mexico as a seed to the salad on a consumer’s plate. Along the way, the tomato effects taxpayer dollars that are used to study GMOs, the land of growing the tomato was drenched in toxic pesticides, the waste, brought miles away, and affects a neighboring predominantly low-income neighborhood. The farm workers were exploited and suffered greatly in the process. The workers are underpaid, and will face many health problems from their exposure to the harsh pesticides over time. The tomatoes themselves are picked way too early and frozen. They have to travel many, many miles, wasting gas and fossil fuels along the way. Besides the waste of fuel, they are each wrapped in plastic and trays, which are all “disposables,” convenient for human life but dreadful for a future of a healthy planet. The big trucks are refrigerated, consuming more and more energy. Lastly, the tomatoes are blasted with gas to prompt early ripening. This produces a tomato with lackluster flavor and also a lack of nutritional value.  

---

111 Ryn, 113.
112 Ryn, 112.
“While Bahouth’s tomato does not single-handedly destroy cultures, disfigure landscapes, or change the climate, it is an integral part of the system that does all of these things. The damage is done slowly, cumulatively, through a series of small failures of design and conscience.”¹¹³ This is to say, this tomato isn’t the culprit here. The system of food that we have is a flawed system that doesn’t take this form of “ecological accounting” into mind while going about its business. However, just as Thich Nhat Hanh was able to see clouds in a piece of paper, one can see a farmworker struggling with lifelong health problems because of exposure to pesticides on the tomato farmer. One could also see a child facing serious nutritional problems from eating food stripped of its natural nutrients every day for their school lunch. One can imagine the massive amounts of pollution, not to mention the expenditure of energy, caused by transporting this very tomato a long distance, from Mexico to Maine for one example. Equally, one can see the damage this system of monocultures, lack of connection to place, and reckless use of resources has caused to not only our planet but ourselves. In terms of a sound environmental future, this is not a sustainable path to go down.

How would this tomato’s story change coming from a sustainably designed home garden? Well, maybe the seeds were from a local store. They were planted by grandpa and his grandson, no human rights abuses in the process—although maybe a grandson who is a little tired of hearing grandpa’s classic stories about the war. The tomato has all the nutritional value that it should have, without the miles traveled and accumulated pesticides of a conventionally-produced tomato. In terms of a sustainable choice, a home garden is both easier to understand and break down. The knowledge of the “ecological history” is so much more graspable on this “human-scale” level.

¹¹³ Ryn, 113.
Sustainable Home Gardening. First things first, the act of home gardening is already a step in the right direction. Breaking from the norm of buying produce from the grocery stores, of supporting this fractured food system blindly is already the first step to a sustainable home garden. In order to design a home garden well, one should follow the principles of ecological design outlined by Van Der Ryn: solutions grow from place. This one is the most relevant to the discussion. In order to best have a garden suited to your own needs and that of the unique environment it inhabits, build a solution from place. For a designer, place refers to the specific local conditions—amount of daily sunlight, climatic conditions, etc. Place can be expanded to include the same aspects of “place” mentioned in the previous chapter. An individual can plant the house garden of their childhood dreams and still make it sustainable.

There are infinite ways to design a home garden in a sustainable manner. Outlined below will be a brief tour through several sustainable garden techniques. However, in terms of designing a great home garden, the world is your oyster—provided you respect the natural systems and processes already in space. There are a few design techniques home gardeners can use to make a garden that is as sustainable as their intentions.

Permaculture. If Van der Ryn and Cowan provide a way of conceptualizing these sustainable design principles, permaculture is a way of applying these concepts in a practical way.

“Permaculture uses a set of principles and practices to design sustainable human settlements.”114 This word, as one may imagine is a contraction of “permanent culture” and “permanent agriculture.” What is key about permaculture is the combination of a cultural/ethical worldview and sustainable agricultural practices. A key aspect of permaculture is the mimicry of natural

---

114 Hemenway, Toby. Gaia's Garden. 5.
systems--using nature as a model, but still including humans. The goal of permaculture is to create a relationship between humans and these natural systems, and ensuring a sustainable future. There are many things to bear in mind when making a design project: practices like organic gardening, recycling, renewable energy, and even environmental and social justice as “tools for sustainability.” Permaculture acts as the “toolbox” that helps us organize and make decisions utilizing those tools. It is an interdisciplinary design approach with many different strategies, which seeks to make the best features of whatever is available to it.\textsuperscript{115} Ultimately, permaculture isn’t based on “stuff,” but rather the connections and relationships between everything.\textsuperscript{116}

Permaculture echoes the same principles as Van der Ryn and Cowan. The main concept of permaculture advocates for design that mimics and agrees with natural processes and systems. Permaculture includes ethical decision-making based on human health and environmental health. Permaculture gardening is also very broad definition, in that it involves redoing a garden to best suit the natural environment it inhabits.

What permaculture does is to envision gardens or any other design project as a small ecosystem. The application of ecological thinking to the garden can produce a more sustainable garden by copying the techniques of natural systems. The major “take aways from nature” are as follows.\textsuperscript{117} The first and most basic ingredient is soil. Not just any soil, but soil rich and fertile in nutrients and organic matter. The second is “plants that draw fertility from deep in the earth, from the air, and from rainwater.” The third is drawing from all nature has to offer—plants can be nourished by the earth, air and rainwater. The fourth is a “layer-cake,” by utilizing layers of

\textsuperscript{115} Hemenway, 5.
\textsuperscript{116} Hemenway, 6.
\textsuperscript{117} Hemenway
vegetation that can support other organisms. The fifth is the choice of perennial plants over annual plants. The last is allowing for healthy relationships between plants and all other organisms, from humans to insects to microbes. The last is a concept that Van der Ryn and Cowan would agree with---increasingly closed cycles. This style of gardening should be as self-sustaining as possible, over-time relying less on outside supplies. “Except for the harvest, little from the garden is lost by leaching and erosion—it’s all recycled.”

A key principle of permaculture involves mimicry of natural patterns. Nature has many repeating patterns, its own style of landscape design. These patterns are often spirals, waves, branches and circles. These patterns are manifested in many scales, from the spiral in a daisy flower to the celestial patterns of constellations. What these patterns can be described as nature’s own problem solving technique—“moving, collecting, harvesting or dispersing matter and energy in a marvelously simple and effective way.” Human-made gardens are typically done in a grid or straight line style. However, by using these natural patterns as the basis for our garden design we can make a more efficient use of space and labor and work in a way more in tune with natural systems. One style of garden that exists in a natural form is the keyhole garden. The keyhole garden is a space-saving alternative to the traditional row garden, built in a keyhole shape. This U-shaped form with a small entrance allows the gardener to plant the same amount of plants in an efficient way. This form has other benefits as well. Depending on the location or the kind of plants used, microclimate adjustments can occur, like taller plants trapping warmth inside the garden. Irrigation is simple because of the condensed size of the garden.

---

118 Hemenway, 31.
119 Hemenway, 37.
120 Hemenway, 37.
Keyhole gardens are aesthetically-pleasing. If planted in a raised bed style, they facilitate gardening for elderly people, disabled people, and pregnant women, by evading the need to bed down. In Monteverde, the keyhole garden proved to be quite successful. Most community members commented positively on the attractiveness and ease of gardening presented in the keyhole system. This kind of garden was well-suited to the needs of the community, as it was accepted by the community and adapted to suit the rainy Monteverde climate.\textsuperscript{121}

\textbf{Xeriscaping.} Although not commonly used to produce edible plants, xeriscaping is an interesting design approach. Xeriscaping is a form of agriculture made for very dry climates. Although “xeriscaping” as a concept has been misunderstood to mean “zero-scaping,” it is linked

\textsuperscript{121} REU.
to creating a sustainable small-scale garden of native plants, “true” to their local conditions.\textsuperscript{122} The seven principles of xeriscaping are “planning and design, grouping plants according to their water needs, using good soil, selecting the proper plants, choosing practical turf grass, efficient irrigation, mulching and maintenance.”\textsuperscript{123} Xeriscaping uses water as a focus, by organizing plants in accordance with their water needs—“to their thirst.” Plants that need more water are located closer to the home and those needing less water are grouped farther away. So, plants are zoned in according to their water needs. Xeriscaping is another manifestation of the desire for native plants and systems. Historically, there is a predisposition towards “water-loving exotic plants” in home landscapes.\textsuperscript{124} When water scarcity wasn’t really a concern, this had a minimal impact on households. However, as water scarcity becomes a prominent issue, this way of home gardening is no longer sustainable. So, particularly in the American Southwest, native plants are planted.

Xeriscaping exemplifies most sustainable design principles because of its attention to local conditions. Despite the standard aesthetic of the American garden being the classic green lawn, this form of gardening calls for a new “local” look! On Long Island, New York, a xeriscaping garden was made as a collaborative effort between the Water Authority, Nassau County and local community members and businesses that wanted to get involved.\textsuperscript{125} The garden was built as an educative effort, but it seems that not all members of the community fully understood the details. One resident commented “I thought maybe it was a garden sponsored by Xerox.”\textsuperscript{126} Another resident had a different opinion, saying “Xeriscape is something some of us

\begin{footnotesize}
\textsuperscript{122} O’Brien
\textsuperscript{123} Musleah
\textsuperscript{124} O’Brien
\textsuperscript{125} Water Authority of Great Neck North Website
\textsuperscript{126} Musleah
\end{footnotesize}
have been doing for decades without knowing what to call it…my lawn hasn’t seen water for 30 years.”

Either way, both individuals expressed interest in this garden system. Xeriscaping isn’t traditionally utilized in a kitchen garden, but can be experimented with in future home garden projects. As water scarcity becomes an issue of increasing concern, this is a regionally-appropriate sustainable solution.

What all of these design techniques speak to is a need to apply sustainable techniques to home gardens. If home gardens are merely translations of large-scale conventional agriculture to a minute scale, they are merely a repeat of the same ills but at the household level. By applying these sustainable design principles to home gardens, they can more greatly contribute to a sustainable alternative to industrial farming. Most of these techniques are relatively simple and don’t require a degree in agriculture for their successful integration into a home garden system.

What the design element speaks to is a trust in natural systems. The industrial system is as far from this local sensibility as possible. This is another side of the sustainability debate. In order to be sustainable, these techniques must not only be sustainable from an ecological perspective, but from a social and cultural perspective as well.

Chapter 5. Politicizing the Garden—Political Perspectives on the Home Garden

In a round table discussion in Monteverde, Costa Rica, another woman spoke of her positive experience having a home garden. She mentioned that having a garden is to have *la merienda*. This is to say, having a garden is having a daily snack or a light meal on hand. Most gardeners are proud to have ready access to food they have produced themselves.

---

127 Musleah
128 REU
When asked about their individual motivations to garden, another woman in the same focus group interview said: “Sembrar es poder.”129 This translates to mean both “to harvest is to be able,” and “to harvest is power.” Home gardening, although it is an individual act is a way to increase resilience, both on an individual level and a community level. Having a garden is a form of reclaiming control over one's diet. Although one household garden may not make any sort of serious political change, it provides individuals with both a sense of pride over their own gardening accomplishments as well as a way to eat healthier at home. This decreases reliance on the fractured food system, and gives gardeners “mini food system” of their own design.

Can a home garden be viewed politically? The home garden is a private endeavor, an extension of the home in most cases. Things within this private sphere are less graspable for the political system, typically outside its domain. Although a political system in which each house is provided with a flourishing garden would be nice, that just isn’t a practical and graspable system. However, there are motions that policy-makers can make to support a lesser reliance on the industrial food system. Grappling with concerns like feeding a growing population in a sustainable way, policy-makers are facing more challenges than ever before in responding to problems. What the home garden encourages is a resilient system for individuals to complement what the greater systems are giving them already.

On a global and national scale, it is evident that a “global industrial agricultural system” is an unsustainable model. This model chronically exploits those that it should support. This model strips eaters of their connections with their food. This model supports itself through subsidies for unsustainable farming, so that needs to be changed. The current farming system heavily relies on global transportation and imports, and is exploitative to vulnerable populations.

129 REU
In the Millennium Ecosystem Assessment, four global scenarios to explore “plausible futures for ecosystems and human well-being” were developed. These scenarios are divided into four main models. The first model, “the global orchestration model,” focuses on global trade and economic liberalization. The second model, “order from strength,” is focused on security, protection and emphasizes regional markets. The third model, the “adapting mosaic,” focuses on “regional, watershed-scale ecosystems as the focus of political and economic activity.” The last model, the “techno garden,” is a globalized world of connections via technology.

For the purposes of a sustainable food system, the ideal model for policy-makers to aspire to is the “adapting mosaic.” The current state of affairs is a global, dispersed, profit-driven model. Agribusiness and its practices of monoculture are completely disconnected from local knowledge and local environments. Local knowledge ensured people could produce food in accordance with the natural systems and local environmental conditions. Food policy from a national level can’t capture all these local needs while attempting to manage the difficulties of keeping a nation fed. Approaching food issues from the local level is of the utmost importance. In terms of future policy, making choices at the local level, utilizing the principles of sustainable design and ecological economics is what will make for a more sustainable future. This “adapting mosaic” will provide greater stability on a national level. Making decisions about agriculture and food is better at the local level, because of increased knowledge of the particular conditions—socioeconomic, cultural and ecological that surrounds the issues at hand. In this model, the regions can adapt to the many challenges of managing changing ecological conditions in a more locally appropriate way.

---

130 Millennium Ecosystem Assessment
131 Millennium Ecosystem Assessment
132 Millennium Ecosystem Assessment
This brings to mind one of the principles of ecological design—“solutions grow from place.”\textsuperscript{133} “Only a few generations ago, it would have been absurd to suggest that one should design and build in ways that did not reflect local climate, materials, landforms and customs.”\textsuperscript{134} Some examples of this idea put into practice are the local food movement and permaculture, both of which seek answers at the local level to questions related to the food system. Today’s consumers are becoming more conscious that it may not be in their best interest to eat those tomatoes from Mexico. As consumers gain insight to the mechanisms of the food system, and the way it not only exploits other humans but natural systems, they may feel motivated to seek local answers to the problem of the food supply. Part of this “adapting mosaic” scenario involves “improving knowledge about ecosystem functioning and management, which results in a better understanding of resilience, fragility, and local flexibility of ecosystems.”\textsuperscript{135} By working at a local level, consumers, farmers, and policy-makers can collaborate to share knowledge necessary to a successful, resilient food system.

An essential component of a new model is the garden. In terms of our food system, the household garden, although it is a secondary source of food, can be understood as a micro-representation of the kind of food that is valued by individuals and by various cultures. As evidenced by the data of the NGA survey, people plant things they want to eat. People see in the gardens, as evidenced by the quote at the start of this chapter, a place to reach out the window and grab fresh food. The household garden is unique to analyze from the policy level because of its small, intimate scale. It is a reflection of cultural values, important foods, and the basis of the formation of intergenerational knowledge about gardening. What this research has revealed is

\textsuperscript{133} Ryn
\textsuperscript{134} Ryn, 88.
\textsuperscript{135} Millennium Ecosystem Assessment, 72.
that the garden is ultimately a representation of the individual food self-sufficiency and a basis for household food security. At the heart of this “adapting mosaic” model is the garden as a component of maintaining food security. How can the political system incorporate gardens into its policy choices? It is not likely that any politician will offer a garden to each family, and if that was the case, it wouldn't be an efficient system. However, politicians can do a few things to encourage home gardeners to make it easier.

Ideally, each piece of the “adapting mosaic” model is self-sufficient. Self-sufficiency, in ecological terms, is manifested as a closed-loop system. Nature's processes are cyclic and restorative. From the water cycle, to the way soil is nourished by organic waste, nothing is lost in natural processes but repurposed into something useful. To say it succinctly, waste equals food.\textsuperscript{136} Materials move through systems in a non-linear way. However, typical economic and political processes operate in a linear way. In terms of these systems, if each patch of the abstract mosaic functions in accordance with these cyclical patterns, the whole mosaic works. Ideally, these “closed-loop” systems function both ecologically and socioeconomically.

\textit{Urban Zoning}. In the urban setting, home gardens are typically manifested as community gardens as opposed to individual property. So here it is easier for the political system to intervene. First, drawing on New York City as a case study, community gardens have been both bullied and supported by the political system. Operation of community gardens assisted by the government had been practiced during World Wars I and II and the Great Depression.\textsuperscript{137} In the 1970s, gardens were constructed as a form of taking control of the vacant spaces in New York. Through formation of garden coalitions and the manipulations of politics of scale, the home

\textsuperscript{136} Ryn, 127.
\textsuperscript{137} Smith, Christopher M. and Hilda E. Kurtz, \textit{Community Gardens and Politics of Scale in New York City}, 195.
garden was saved, and recognized as something that significantly contributes to life in the neighborhoods and the city as a whole.138 Because of grassroots movements, these community gardens were saved from being converted into high-rise housing. Creating housing is always essential, especially as urban populations grow. But, creating green spaces is another important part of establishing a healthy city. Urban planners and policymakers face tough decisions. However, at an urban level, the garden can serve numerous benefits that make them a valuable use of space. In terms of future planning, it is essential for planners and policymakers to bear this in mind. Home gardens, or small-scale community gardens often have to be “seized” by community members, as vacant lots that they reclaim as a community. Urban policy can change to support this movement. Through zoning practices, these empty spaces can be taken advantage of and utilized in urban farm projects. Currently, these projects occur at a local level, run by small businesses and non-profit organizations. If the government made policy to support these local organizations, they could work within their own communities, utilizing their local knowledge to make a garden suited to the needs of their communities.

To bring this sort of thinking to higher-level policy concerns, this way of zoning can be brought up to the regional level, and connected to farms and green spaces. Within urban and semi-urban spaces, vacant lots or even underdeveloped areas can be zoned as agricultural zones. By “re-making” vacant urban space into thriving gardens, communities can thrive.

**Education.** Another way that gardens can be implemented to fill in the gaps that the industrial food system leaves out is in the form of education. In the NGA survey, most participants believed that gardens had a great educative potential. A suggestion for policy-makers is to look to the garden as an educative tool, as it is a way to educate people of all ages about a

138 Smith, Christopher M. and Hilda E. Kurtz, *Community Gardens and Politics of Scale in New York City*, 204.
healthy lifestyle, food security, and about agriculture. Gardens can be utilized in schools as a form of experiential learning. Secondly, as part of the mosaic model, schools can incorporate these gardens into their food system. Edible Schoolyard is one example of an organization operating to facilitate the inclusion of gardens into elementary school curriculum. Dubbing it “edible education,” this organization “envisions gardens and kitchens as interactive classrooms for all academic subjects,” and a “free organic lunch for every student.”¹³⁹ Growing out of a project started at a school in California, this organization now works on a global level, with each “Edible Schoolyard” location varied based on its own local needs and concerns. This project both exemplifies the “closed-loop” system mentality as well as the abstract mosaic model. In its garden projects, Edible Schoolyard connects the kitchen to the garden, aiming to make as little waste as possible, while providing education and nutritious food to the students and school staff. This is an efficient way of going about things, as it maximizes the usefulness of the garden while generating minimal waste, hence “closing the loop.” Because of the mission of educating young people, this organization “closes the loop” in terms of building a more sustainable future. By encouraging younger generations to engage in “farm-to-table” practices, they are paving a future of more sustainable practices.

Secondly it is a prime example of the adapting mosaic. Although the various locations share similar curriculum, goals, and provide similar services, each location is altered to fit local needs and suited to the environmental conditions of the local community. In terms of the political perspective on this, this would be a good place for intergovernmental relations to develop. The government can take a page out of this book to promote the incorporation of this kind of education into the education system. In addition, by providing support to these organizations,

¹³⁹ Edible Schoolyard Website
either through tax breaks or subsidies, the government can ensure availability of this crucial education to future generations.

Another example of a “closed-loop” style project based in education is the Pasona office building in Tokyo. This building is filled with edible and decorative plants, housing over 200 species of varied produce.\textsuperscript{140} This building hosts educational lectures and offers classes for everyday people. It is located in downtown Tokyo. From its leafy exterior to its interior urban farm facilities, this building connects Tokyo residents with nature. This building is a closed-loop style project, as the farm project feeds the workers in the building. This building is actually the largest “farm-to-table” project located in an office building in Japan.\textsuperscript{141} The Pasona project works to advance urban farming through educational programming, such as community

\textsuperscript{140} Feng, Sophie “Japan: 'Office Farming' Greens Tokyo's Urban Jungle”
\textsuperscript{141} Kono Designs
workshops.  

What the Pasona project demonstrates is a successful urban farming project, used for education and provision of healthy food to the community. This idea should be adapted and translated as part of the adapting mosaic model. As the Pasona project is based in an urban setting, it serves as a model to other cities and urban policymakers across the world. Today's increasingly urban populations demand a source of food. If 60% of the world's population is expected to live in cities by 2030, it is essential to find a sustainable way to feed these hungry urbanites. It is atypical that the current food system provides city-dwellers local food. However, what Pasona does is insert food production right into the urban fabric. If other cities did similar projects on a larger scale, potential food crisis for the growing urban population can be avoided. Policymakers should seek to translate agriculture into the urban setting. Reliance on agribusiness means reliance on the transport of distant food sources. By investing in urban agriculture, policymakers invest in resilience.

Although gardens can be found across cultures, in order for policy to function successfully, it must be culturally appropriate. Policymakers must bear in mind the culture into

---

142 Feng

143 FAO, “Food for the Cities.”
which they plan on implementing their policies when making decisions. There is tension between working on a large-scale and developing culturally appropriate policies. As food and agriculture is linked to culture, but becoming an increasingly global system is it possible to standardize agricultural policy?

GLOBAL G.A.P. is an organization that aims to promote safe and sustainable agriculture at a global level by setting voluntary standards of agricultural products. This organization works from the private sector to incentivize producers to adopt sustainable practices. Historically, this organization began connecting retailers belonging to the Euro-Retailer Produce Working Group and has continued expanding their outlook. This is an interesting solution. It connects consumer demands for sustainable products with the producers themselves. This is a private-sector solution, but policymakers can look to this model while crafting policy. If the demands of consumers at a local level are linked to local producers, these demands can be made in a culturally suitable way, while supporting local industry.

For the mosaic to work, there has to be a management of local issues at the local scale, but with input from the overarching scale, connecting to the grand scheme of things. Ideally, people are working to create culturally appropriate solutions at the local level, and linking these with overarching standards. Any attempt to universalize values or policies is dangerous, but by connecting these policies with local practices and values, positive change can result.

By incorporating gardens into the urban setting, integrating gardening into the school yard and cafeteria, and promoting relationships between consumers and producers, home gardens can form an alternative to the “bottleneck” food system.

---

144Global G.A.P.
Most of these policy suggestions speak to a greater need to expand their focus when making decisions. Instead of focusing on exclusively standard economic analysis, they should do an ecological economics analysis, and take human and environmental health concerns into consideration. Policymakers face many difficult choices to make. At every decision we are at a crossroads. Do we prioritize short-term goals with the hope of increasing profit to be able to deal with environmental issues later on when we are richer? Or, do we change our focus to a more long-term perspective and mitigate while we still can? Ultimately, policymakers have to consider these factors and make informed decisions to the best of their abilities.
Bibliography


<http://kgi.org/blogs/roger-doiron/home-garden-worth>


Food and Agricultural Organization, “Food for the Cities”


Global G.A.P. <http://www.globalgap.org/uk_en/>


<http://www.academia.edu/357673/Home_gardens_as_an_alternative_for_sustainability_challenges_and_perspectives_in_Latin_America>

Research Experience for Undergraduates Site, Globalization and Community Health: Combining Social Science and Engineering, National Science Foundation award #1156735. N. Romero-Daza, PI and D. Himmelgreen, Co-PI, Department of Anthropology, University of South Florida


Water Authority of Great Neck North: “Xeriscape, Nature’s Garden”

<http://www.waterauthorityofgreatnecknorth.com/xeriscape.html>