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Urban Agriculture: A Response to Urban Food Deserts

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Urban Agriculture: A Response to Urban Food Deserts

Thesis submitted in partial fulfillment of the requirements for the degree of Master of Community Planning

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Abstract
As an integral part of a new and improved food economy, urban agriculture has the potential to bring productive uses back to urban lands while creating jobs, social capital, green space, and, most importantly, fresh produce. The City Council of Cincinnati recently introduced a program to allow urban agriculture on city-owned vacant parcels. This thesis attempts to identify Cincinnati’s food deserts – areas without transit or pedestrian access to full-service grocery stores – in order to determine whether the new program has the potential to improve food access in the areas that need it the most. Once the food deserts are identified using GIS software, these are overlaid on maps of the proposed vacant parcels to determine if there is any overlap. Finally, an inventory of additional vacant parcels in the city is examined to determine the possibility of these being used to ameliorate the food access issues.
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Chapter 1: Introduction

This thesis contrasts the modern food system along with its inherent problems with a re-localized, sustainable, and economically viable food economy. As an integral part of that economy Urban Agriculture (UA) has the potential to bring productive uses back to urban lands while creating jobs, social capital and green spaces (UNDP 1996). By growing nutritious fruits, vegetables, meats and eggs, a city and its dwellers can decrease their reliance on foods shipped vast distances while at the same time beautifying neighborhoods, cleaning the air and creating opportunities for education and exercise.

If done properly, farming in the city can create vibrant green spaces, preserve cultivatable land, cool buildings, revitalize brownfield sites and improve biodiversity (Mendes 2008). Older industrial cities with declining populations often suffer from social ills related to poverty, malnutrition, unemployment, in addition to large portion of unused property within their limits. UA can create vibrant social spaces; promote food security, community safety, physical activity, and social inclusion. In addition, it has the potential to enhance community capacity building, encourage participatory decision making and improve the health and nutrition of residents (Brown and Jameton 2000). This paper attempts to take a first step towards bringing some of these benefits to Cincinnati.
by illustrating the areas of the city in most need of increased access to fresh vegetables and to identify within those areas, vacant parcels of land upon which UA could be practiced.

**Problem Statement**

I consider herein the effects that a lack of access to fresh, nutritionally balanced food can have on the health of community residents. The nature of the modern food system along with a host of evolutions in the food retailing business model have left low-income communities with very few healthy food options. Food deserts, as these communities have been termed, are in cities and rural areas around across the United States. Many cities have made attempts to entice full-service grocers into the inner cities, often with financial incentives or tax holidays, which have been met with mixed results. The economies of scale necessary to make the modern food retailer profitable are not typically attainable in the central city model. Some retailers are exploring alternative store models tailored specifically to urban areas, but few have found their way to Cincinnati’s poorer neighborhoods. Despite the best efforts of non-profit organizations to operate on a co-op model, few are successful for long (Winne 2008).
This thesis does not propose that Urban Agriculture will replace completely the traditional model of food procurement in cities (i.e. purchased from large retail grocery establishments); however there is reason to believe that it can have a measurable impact. Individuals or organizations starting garden plots throughout the city are an important step, but for the effect to be demonstrable and widespread, the movement must be concerted and planned. This implies the need for local governments and civic organizations to bind together to remove the regulatory barriers that exist, while actively promoting extensive use of vacant land for food production. Additionally, if Urban Agriculture is being proposed as a way to alleviate a social, economic, or environmental problem, then the geographic extent of these problems is an essential piece of information.

The argument that underscores this thesis, is that both urban and rural areas are tied to a food system which has succeeded in getting low-cost food to markets around the US and world, but failed to provide for the balanced food needs of many inner city residents. I profile briefly the failures of the system and advocate for structural changes to that system necessary to provide healthy food to all people in the United States. I do not propose that all residents will soon begin eating only food grown in their neighborhood. However, much like the weeds that can grow from the cracks in the pavement, urban agriculture can find its first home in the food gaps of cities.
1.1 Background

“Green Trends”

Along with the rest of the country, Cincinnati seems to be embarking on a trend of “green” consciousness in which governmental and non-governmental programs, policies, activities, and plans emphasizing environmental stewardship gain popularity. The meaning of “green” differs depending on the person defining it. To some “green” means a reduction in the usage of petroleum-powered vehicles in order to avoid carbon-dioxide and other tail-pipe emissions which are noxious to people, plants, and animals (often referred to as ‘greenhouse gases’) and may even lead to global climate change. To others it means the reduction of stormwater runoff by using less impervious pavement and more native grasses, which in turn have the added benefit of beautifying neighborhood parks and streetscapes. Yet another group of “green” advocates emphasize the need for a set of “reduce, reuse and recycle” guidelines to avoid over-consumptive purchasing behavior. Regardless of the lack of a singular definition or any nuanced discussion of the benefits of any “green” policy, it is an extremely successful marketing strategy.

Oil companies now use the word and the color in nearly every television and print ad; large department stores embark on “green” campaigns to sell more fluorescent light bulbs which purportedly use less electricity (hence reducing the need for coal-burning power plants); and food suppliers emblazon the words “organic” in large green letters across the packaging, which underscores the idea that food crops grown with fewer chemical fertilizers and pesticides have a smaller negative impact on natural systems by both reducing the amount of natural gas used in their production and reducing the amount of those fertilizers and pesticides from running off the field and into natural waterways. Aside from corporate cooptation of the “green” trend, politicians
around the United States have begun using the word and some of the jargon associated with it¹ to win support from environmentally minded constituents.

Here in Cincinnati, the “green” trend has manifested itself in the Green Cincinnati Plan, the culmination of a process begun in 2007 at the behest of the Mayor. The Plan and the legislation behind it focus on “significantly reducing regional greenhouse gas emissions while preserving both economic development and transportation options throughout the region” (City of Cincinnati Manager n.d.). Incidentally, only one of the Plan’s recommendations focuses on food-related greenhouse gas emissions, specifically recommending a reduction in meat consumption among city residents². (City of Cincinnati Manager 2008)

Food Access

Mostly in response to the closing of the only full-service grocery store in the neighborhood of Avondale, Cincinnati City Council passed a resolution in early 2008 establishing a Food Access Task Force to “address the disparity that exists between lower income communities and higher income communities regarding access to quality and healthy food supplies” (Council Doc#200800315). As objectives, the task force intends to develop new grocery stores, improve existing corner stores, and establish farmers’ markets. For the first year, they limit their research and recommendations on the relatively lower income Avondale and Walnut Hills.

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¹ As an example, the recent term “greening the fleet” is used to promote the idea of changing all vehicles in a city (or company) department to more efficient models which reduce the amount of fuel used by the fleet and hence have an environmental and budgetary benefit.

² The production of meat is a significant contributor to greenhouse gas emissions and is also an extremely inefficient source of calories. Cows consume ten pounds of grain for each pound of hamburger they produce (Roberts 2008). The production of grain, in turn, contributes its own gas emissions.
Urban Agriculture

It is in this political landscape that the City of Cincinnati Council unanimously passed a resolution authorizing the use of city-owned vacant parcels for urban gardening. Through a simplified suitability analysis the Parks Department narrowed down the list of lots available for the purpose to 123 (Council Doc#200900006, see appendix). The characteristics used during the elimination process were limited to physical properties (tree cover, slope of terrain, and minimum size) and tenure of the parcels in question. The list of potential parcels was further reduced to 15 after the parks department consulted with the agencies that manage the parcels. In the resolution, City Council mentioned the benefit to the city in the form of maintenance cost savings. In addition, the original motion by Vice Mayor Crowley (Council Doc#200801277, see appendix) states that the use of idle land would help beautify
the city, improve the availability of fresh local foods, supplement the diet of local residents, reduce stormwater runoff, and create local jobs.

Going forward, the task of the City Manager and other stakeholders is to decide on a mechanism to allow for the leasing of 5 to 10 parcels to residents and/or non-profit groups to be used as pilot projects for the 2009 growing season. The City Resolution did not give further instructions regarding the location of the plots in relation to the areas in most need of the aforementioned benefits (i.e. fresh vegetables, job opportunities, etc). This thesis attempts to guide that decision making process by identifying areas of the city that could be called ‘food deserts’ – that is, areas with a lack of retail access to fresh nutritious foods (specifically “full-service” grocery stores). My assertion is that by locating urban agriculture activities in areas where access to retail outlets with fresh fruits and vegetables is limited, the program could partially or completely supplant the role of grocery stores and/or charitable food providers in providing those dietary staples.

<table>
<thead>
<tr>
<th>Goals mentioned in original City Council motion</th>
<th>Characteristics used to choose parcels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost savings by reducing necessary upkeep (i.e. grass mowing)</td>
<td>Slope of terrain (less than 30%)</td>
</tr>
<tr>
<td>Beautification</td>
<td>Minimum lot size (0.2 acres)</td>
</tr>
<tr>
<td>Increasing access to fresh food</td>
<td>Low tree canopy cover</td>
</tr>
<tr>
<td>Reducing stormwater runoff</td>
<td>No present or future use for the land</td>
</tr>
<tr>
<td>Job creation</td>
<td></td>
</tr>
</tbody>
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*Figure 3: Comparison of the intended goals of the program and the characteristics used in determining the selection of parcels*
Let it be noted that I have not been asked by City Council to conduct this research and I have no specific reason to believe they will heed the advice contained herein. However, it is my firm belief that as this and subsequent research continues, the decision-making process over where to site the urban gardens can become more nuanced and hence, more effective.

Considering the original justification for the urban farming program, it would seem that the selection of parcels could have targeting areas of the city where the benefits of UA were needed most. Time constraints were likely the biggest limitation, but also a lack of knowledge of UA as well as a breakdown in communication channels between legislative and executive departments. This thesis does not address the reasons for those limitations nor attempt to recommend changes to city government protocol, but rather attempts to aid future decision makers in the methods by which they may target an urban agriculture program in food desert areas.

1.2 Research Questions

There are three main research questions that guide this thesis project:

1. Where are the food deserts in Cincinnati?

2. Are any of the proposed parcels for the Cincinnati Urban Farm program contained within the food deserts identified?

3. If the focus of the City pilot program were on increasing food security in the deserts, which parcels would be best candidates?
1.3 Limitations

This project has needed to rely on secondary data sources and is therefore subject to the accuracy of those. Furthermore, there is a lack of socioeconomic and other data (such as car ownership) at the geographic level that was required. Though it would enrich the study, the time necessary to gather and incorporate such data into the analysis would have been prohibitive for a Master’s thesis.
Chapter 2: Literature Review

2.1 Food Systems Defined

The concept of food systems is uncommon among food researchers, who mainly deal with specifics such as diets, nutrition, organics, agriculture, etc. “Food systems” has been defined previously (Pothukuchi and Kaufman 2000) as the chain of activities and processes related to the production, processing, distribution, disposal, and eating of food. Similar to a natural ecosystem, each part is most deeply understood in relation to the whole.

2.1.1 The Current Food System

The food system governing the world today has its roots in the modernist era. Technology, organization and command-and-control devices have been mobilized to conquer obstacles to material progress. As early as the depression-era 1930s, the federal department of agriculture began to subsidize the production of high-calorie crops such as soy beans, wheat, and especially feed grains such as corn with the stated goal of reducing domestic hunger and providing a more stable livelihood for the nation’s farmers.
In theory, these agricultural subsidies have the effect of increasing agricultural production and/or driving down domestic food prices (Glauber 2008).

With the advent of the green revolution and the agricultural policies of the Nixon administration in the early 1970s, farm yields in the United States continued to rise quickly. Technological advances and increased application of petroleum-derived fertilizers, pesticides and herbicides required less human labor and therefore, allowed larger pieces of land to be owned and farmed by one family, or one corporation. This farm consolidation has allowed for efficiencies of scale unseen in the history of civilization. American agricultural output in 2006 was two and a half times that of 1948 while the number of independent farms has fallen by over 100 per cent (Economic Research Service 2009). In the relatively short span of a generation, the food system has gone from one of perennial fear of food insecurity to one in which the overproduction of calories is so large that an army of marketers must be employed to develop new ways to sell more calories to increasingly over-fed consumers.

One result of the consolidation of farms and the commoditization of crops has been the turning upside down of the food economy. The farm’s share of retail food prices has fallen from 31 per cent of the total in 1977 to roughly 20 per cent in 2004 (Stewart 2006). The remaining percentage goes to various intermediary marketing agencies involved in processing, storing, transporting and selling the food to consumers. This remaining percentage - often called the “marketing bill” - has also undergone reallocation. Food processors have historically accounted for the largest portion. However, their share has eroded significantly in the past 30 years (Roberts 2008). Large grocery stores and food-service chains are now powerful enough to dictate nearly everything about the products they buy, from the price of the cereal to the color of the meat.
2.1.2 Grocery Stores

The emergence of the grocery store as the primary food retailing establishment in the United States can be traced to the introduction of the supermarket in the 1930s. The supermarket, which had a large selling area and a broad selection of products under one roof revolutionized the U.S. food retailing industry and provided the impetus for fewer but larger retail food stores (Marion, Mueller and Cotterill 1979). Thus, with store formats growing larger and investment in “location analysis” methods, it was to be expected that the overall number of grocery stores per capita would decrease, and retailers would likely follow their more affluent customers to the suburbs.

The retail revolution has generally been beneficial for those consumers with the mobility to reach stores located outside of walking range. The historical trend toward food that is more convenient, more varied, and less expensive has been accelerated (ibid). However, such improvements at the retail level come at a huge cost to those farther up the supply chain. To survive, food manufacturers have been forced to take on drastic cost-cutting strategies which have negative consequences for labor, environment, and ultimately, the quality and nutritional value of the food.

The efficiencies of scale necessary for retail food establishments to prosper have led to a much larger store format serving larger geographic areas. Big box retailers such as Wal-Mart and Target have caused the consolidation of the grocery business in some areas. Retailers believe they can decrease costs through supply-chain management practices—coordinated activities that generate operating, procurement, marketing, and distribution efficiencies. Expected efficiency gains and lower investment

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3 A method by which the most profitable store locations are chosen based on detailed demographic characteristics and transportation modes.
requirements will allow them to maintain profit levels while keeping prices competitive with big box retailers, warehouse club stores, and other emerging and potential rivals (Economic Research Service 2000). The global buying power of such very efficient companies has put an increased financial burden on traditional local grocery stores as well as the national supermarket chains. These pressures often affect small-scale inner-city grocery stores the most, often leading to them closing or moving to areas with more profit potential.

When determining the market demand for grocers in a given area, several factors sway the analysis; among them are the median income of area residents and the population density of the area. Unfortunately for poor areas, a high median income has a stronger correlation to store location (Winne 2008). Supermarkets primarily base their locational decisions on revenue projections and number of targeted customers they can reach within the trade area. The trade area in dense urban areas is smaller because of the lower speed limits on streets and the prevalence of zero-car households.

Spatial limitations can also prevent grocery stores from remaining or relocating in cramped urban neighborhoods. Often stores have only one loading dock which cannot accommodate the larger delivery tractor-trailers. The additional architectural design costs to compensate for such problems on top of already high costs for rent, insurance and security lead to grocery disinvestments at inner-city locations. Green field developments at the urban periphery where land prices are lower, zoning regulations are more lenient and median income is higher prove to be much more attractive.
When a small grocery store is in competition with large supermarkets, the grocery store often must create a niche market by selling unique, premium quality, or ethnic foods that are not easily found in supermarkets. However, the demand for these relatively more expensive specialty goods and services is less likely to exist in low income areas.

There are signs of hope for some inner cities where grocery chains are finding economic success with alternative store formats which take advantage of the high densities of certain middle-income neighborhoods. It remains to be seen if these models can also sustain themselves in lower income areas of Cincinnati where the density continues to decrease.

2.2 Food Security

The issue of matching food supply to the food need, especially for urban inhabitants, has long been a source of social, economic, and political concern. Archeologists attribute the fall of some ancient urban civilizations to the simple lack of food (Brown and Jameton 2000). Others argue that for most of the twentieth century, starvation and malnutrition have been due mainly to the inequitable distribution of the food resources of the world (Ponting 1991, Action Against Hunger (ed.) 2001) or an inherent failure in the capitalist economic model (Marx 1906). Thomas Robert Malthus, a minister and social theorist writing in the early days of Europe’s industrial revolution, cautioned that hunger would always be a destabilizing factor because, by his calculations, populations tend to grow geometrically, a rate that easily exceeds the usual arithmetic rate of growth in food production (Malthus and Gilbert 1798). As urban population continues to grow, greater agricultural production has been demanded of the hinterland. Various
attempts to increase yields on existing agricultural lands have been successful. The Green Revolution of the 1960s emphasized an increase in the use of hybrid seeds and carbon-derived pesticides. The sustainability of this system, considering the detrimental effects these technologies have on the environment, is doubtful (Ponting 1991, Brown and Jameton 2000, Roberts 2008). In his article ‘Malthus foiled again and again,’ Trewavas (2002) argues that despite some of these deleterious effects of industrialized agriculture and the hunger that continues to exist in the world, human ingenuity will again prevail over malthusian fears of overpopulation and food shortages. The latest incarnation of these solutions from the halls of biotechnology comes in the form of genetically modified organisms (GMOs), now being aggressively promoted as part of a second Green Revolution in Asia and Africa by various philanthropic groups (Bill and Melinda Gates Foundation 2009).

Despite the relative prosperity and agricultural modernity in the United States, hunger remains a problem. The USDA (2006) estimates that 35.5 million people—including 12.6 million children—live in households that experience hunger or the risk of hunger. This represents more than one in ten households in the United States. The public health consequences of hunger are evident. Even for those without clinical malnutrition, hunger is linked with increased incidence and virulence of infectious diseases, school and work absences, low energy, and problems with concentration (Brown and Jameton 2000).
2.3 Food Deserts

In an urban context, the term ‘desert’ is used to describe an environment lacking in certain facilities (Baines 1974). It began to be used in relation to food in the early 1990s by residents of a public housing development in the west of Scotland (Cummins and Macintyre 2002). The definition – more recently as applied to food - has gone through a number of incarnations, however the gist remains that food deserts are large and often isolated geographic areas in which fresh nutritious food is inaccessible due to physical or economic barriers (Ashman, et al. 1993, Lawrence 1998, Mari Gallagher Research & Consulting Group 2008). Changes in food retailing business models have led to many corner stores and full service grocers abandoning the inner city in favor of higher revenues of suburban locations (Bromley 1993). Assuming there are no farms at which to grow or otherwise procure food stuffs, this situation leaves the population in food desert areas dependent on personal vehicles, taxis, or public transit to reach a grocery store.
Figure 4: Diagram of the barriers to healthy food access

An increasing amount of research has attempted to quantify and locate food deserts. Mari Gallagher (2006) has completed a number of studies on food access issues in the Chicago area and The Food Trust (2002) is active in showing the food outlet inadequacies in Philadelphia. The U.S. Department of Agriculture has recently begun to undertake a comprehensive study which intends to capture the extent to which there are areas with limited affordable food access for low-income communities (United States Library of Congress 2008).
There is some debate over whether affordability should be included in the concept of food deserts. Studies conducted in Britain have found no difference in the price of a basket of food (‘healthy’ or ‘unhealthy’) purchased in a low-income neighborhood (Cummins and Macintyre 2002). Furthermore, reports conflict as to whether there is indeed a lack of healthy food in those communities (Piachaud and Webb 1996) and some accuse government officials and social service advocates of blindly supporting the concept of Food Desert to further health policy agendas (Cummins and Macintyre 2002).

The negative health impact to residents living in Food Deserts is evident. Communities lacking nearby grocery stores, but awash in fast food restaurants, are likely to have increased premature death and chronic health conditions (Mari Gallagher Research & Consulting Group 2006). These effects are most pronounced among the single mothers, children, the disabled and elderly populations who bear the costs through shorter life spans and increased incidence of diet-related diseases.

What is the effect on residents of a neighborhood when the only local grocery store closes? For populations who do not have access to a private vehicle, residing in a food desert may have detrimental effects on overall health and quality of life (Liu, et.al. 2007). A healthy diet has been found to reduce the risk of many chronic diseases (McCullough, Feskanich and Stampfer 2002). Conversely, the majority of these health problems can be attributed to a diet low in fruit and vegetable consumption (Darmon, Ferguson and Briend 2002) and to eating large quantities of sugary or high fat foods (Must, Spadano and Coakley 1991). Most Americans, especially those of lower income, shop for food at a local supermarket (Winne 2008). Though grocery stores also stock unhealthy foods, these items are more readily available at corner convenience stores, which are less likely to carry the items necessary to support a healthy diet.
In the early 1980s, Trevor Hancock, a physician and member of the Toronto Public Health Department, and Len Duhl, a psychiatrist and professor of urban development and public health, founded the Healthy Cities movement. The movement represented a changing perspective on community health. Whereas the Western medical profession focused on treating symptoms of ill individuals, public education on health and healthy living could better improve the health of the community as a whole and decrease the burden the infirm placed on public health systems. This preventative concept centered on community education about healthy eating habits, and the prevention of drug, tobacco, and alcoholism abuse. In 1986, the World Health Organization (WHO) adopted the idea and initiated the Healthy Cities Project, which quickly morphed into smaller movements worldwide (Tibbetts 2003). The latest five-year cycle of the European Healthy Cities Network of the WHO focuses research and action around tackling obesity and promoting physical activity and active living. One strategic goal of the network is to study the health impacts of urban agriculture (World Health Organization 2009).

Food deserts are a serious public health dilemma. Though there are limited examples of full-service grocery stores returning to the inner city to capitalize on the densities of these areas, the successes are the exception and not the rule. Cities such as New York, Portland, and Austin are among the cities which have successfully attracted retailers into formerly abandoned areas. The population of Cincinnati is likely to continue falling. It is therefore likely that the gap will generally widen in cities such as Cincinnati between suburban residents with adequate access to healthy foods at reasonable prices and inner-city or poor rural residents who lack such access. As prices for transportation continue to rise and no foreseeable increase in government spending on public transit,
it is also likely that low-income residents may become further isolated from the food outlets that remain. Though the national
dialogue about food deserts in a relatively recent one, there are a number of solutions that have been proposed.

Food banks have traditionally served as a safety net for people whose financial situation is temporarily untenable. There have
been, of course, always regular customers who depended on the food stuffs for survival, but an ever increasing number of
households are becoming reliant on the services of food banks (USDA 2006). Food is procured through large food manufacturers
who can take a tax deduction by donating food which is nearing the end of its shelf life or other products which have been
overproduced. Food bank leadership is very willing to accept the donations and increase their operations and ability to serve more
people and therefore justify larger monetary contributions from governments and private philanthropists. As Mark Winne states in
his book, Closing the Food Gap,

"Concern must be raised...about this codependency and what might well be termed a
stalemate in the battle against hunger." (76)

If the intermediary (in this case, the traditional food retailer) fails to locate and provide the needed goods, another option is
to deal directly with the supplier of those goods. Farmers’ markets provide an added option for consumers and producers to
circumvent the retail food industry. Once common in every large city in the United States, these outlets – sometimes also called
greenmarkets for their abundance of verdant produce – provide locally- and often organically-grown farm products to residents of
urban areas. Due to the increased interest in healthier foods and an increased understanding of the importance of maintaining small
sustainable, farms inside and near urban areas, the number of Farmers’ Markets in the United States has grown from 1,755 in 1994
to 4,685 in 2008 (USDA 2008) – a nearly 170 per cent increase in 14 years. Complaints have been lodged by poverty alleviation advocates that prices for produce at farmers’ markets located in underserved neighborhoods (i.e. food deserts) often outstrip the ability of residents to afford it. Programs introduced by the USDA in recent years have attempted to bridge the gap for low income residents by allowing sellers to accept food stamps and other forms of state-issued transfer payments.

2.4 Urban Agriculture

2.4.1 History

As a result of communal land privatization in England between 1750 and 1850 conflicts arose which led to the ‘allotments’ for the poor. It was a necessary concession to appease the masses of poor who had recently been evicted from land they had communally tilled for generations. The popularity of these early forms of community gardens had ebbed and waned, but allotments remain a vital community asset in many mid-sized British cities (Steel 2008, Crouch and Ward 1988). In contrast, the vacant-lot farming that sprang up in American cities in the 1890s was seen as a temporary solution to poverty (and, less importantly, malnutrition), not a long-term source of employment or fresh produce (Lawson 2005).

The turn of the twentieth century also brought about a desire among city dwellers to live more bucolic lives while still enjoying the amenities of living in or near a cosmopolitan center. This so-called ‘back to nature’ movement helped to bring about the development of city parks, country clubs, and dude ranches, as well as school gardens (Schmitt 1969). Agrarian living provided a
needed respite from the city and a morally rectifying experience for those who could afford it. According to many adherents, the purpose of school gardens, for example, was not to grow a few vegetables and flowers, but to teach civic virtues: honesty, economy, private care of public property, justice, and the dignity of labor (ibid.).

During major depressions in the U.S. economy, city garden plots have provided an extra food source to struggling families and extra cash flow to industrious individuals. The New York Association for Improving the Condition of the Poor (1898) noted that by helping families get out of the hot and crowded city, the program could help fight against tuberculosis. It also kept idle (and possibly mischievous) hands busy, and the vacant lot gardening program was seen to have a better return on investment than other forms of charity.

Gardening began to appear in school curricula in the 1890s with the establishment of the Putnam School in Boston (Lawson 2005). It was not long before the School Gardening movement began to sweep across the country. By offering gardening and other manual and industrial labor in the curriculum, they were also compensating for the recent on-the-job training for children which had been limited by child-labor laws (Lawson 2005). Gardens became places for moral reform and were reported to discourage youth gang activity (Shaw 1910). This began an impressive era lasting over 30 years in which federal monies were available and agricultural education was seen to be an essential component of a child's education. School gardens continued to gain momentum through WWI, but foundered during the post-war economic reorganization.

While earlier programs targeted specific groups – immigrants, youths, the poor – the later programs, arising out of a national crisis, sought to appeal to the public at large. The gardening programs were marketed with a focus on the recreational, social and
nutritional benefits of agriculture in order to attract households and the families (Lawson 2005). During WWII, the Victory Garden movement emphasized thrift and patriotic self-sacrifice. With the aid of several federal and state-level government agencies, gardening burgeoned in cities across the country. However, as the war mania temporarily subsided and government subsidies diminished, the structure that had supported urban garden organizing vanished.

The 1970s saw a renewed interest in urban gardening. Rising gas prices and increasing racial unrest led to a number of states passing legislation to fund start-up and management costs of inner city plots. The U.S. Department of Agriculture (USDA) began administering a program through State land grant university Community Development Extension offices to provide promotion, technical training, and limited funding for seed, soil and tools (Lawson 2005).

An added impetus during this resurgence in public interest, was the environmental movement spearheaded by books such as Silent Spring by Rachel Carson (1962) which helped to expose the negative ecological consequences of industrialized agriculture. Radical ecological theorists in the Deep Ecology movement sought a response to industrialism and other aspects of modernity they felt were responsible for “ecological violence”, personal alienation and social disintegration (Zimmerman 1994). In contrast to the urban renewal programs which proposed a complete clearing and rebuilding of blighted land, some urban activists conjured utopic images of a “green” city lifestyle with recycling and gardening providing a means to solve the environmental, economic, and social woes of the time (Gardens for All 1973).

While many were growing food as a way to increase access to fresh, healthy produce, others were raising concerns that growing within the reach of vehicle exhaust on nearby roads might add pollutants, especially lead, to the food (Lawson 2005). This
led several agencies to begin testing soil for lead before planting a garden. Many of the current regulations which prohibit food production within cities were developed as a response to the presumed hazards that come about when rural and urban activities mix.

2.4.2 Types

The literature identifies three distinct types of UA. In the United States, these categories are commonly referred to as community gardens in which a large lot is subdivided and each family is given a plot to manage; school gardens where gardening on the school grounds is incorporated into the curriculum; and market gardens where flowers, herbs, vegetables, and animals are raised for retail or wholesale marketing (Brown and Jameton 2000). The pattern of urban sprawl in many cities like Cincinnati has created an abundance of empty inner-city lots. Ironically, as land in the inner-city becomes available when failed inner-city businesses and decaying homes are torn down, new suburban housing and business developments overtake rural farmlands at the city's periphery. In order for this newly cleared urban land to be most useful, however, it must be done in a suitable way. Simply leveling the structure and leaving the materials on site (often filling the void of former basement) and then covering with a shallow layer of topsoil makes the newly vacant land nearly impossible to use for UA.

2.4.3 Benefits

This thesis attempts to contrast the problems of the modern food system with the benefits of a re-localized, sustainable, and economically viable local food economy. As an integral part of that economy, Urban Agriculture (UA) has the potential to bring
productive uses back to urban lands while creating jobs, social capital and green spaces (UNDP 1996). By growing nutritious fruits, vegetables, meats and eggs, a city and its dwellers can decrease their reliance on foods shipped vast distances while at the same time beautifying neighborhoods, cleaning the air and creating opportunities for education and exercise.

The literature mentions a host of benefits, which can generally be divided into environmental and social. Often, UA can help cities move towards sustainability goals already pledged. If done properly, farming in the city can improve air quality, create vibrant green spaces, preserve cultivatable land, cool buildings, revitalize brown field sites and improve biodiversity. (Mendes 2008) Older industrial cities with declining populations often suffer from social ills related to poverty, malnutrition, unemployment, and unused property. UA can create vibrant social spaces; promote food security, community safety, physical activity, and social inclusion. In
addition, it has the potential to enhance community capacity building, encourage participatory decision making and improve the health and nutrition of residents.

2.4.3.1 Social Benefits

Placemaking

A garden in the neighborhood, especially if it is cared for by nearby residents can easily become a place which will attract people because it is pleasurable or interesting. England is famous for its “allotment” gardens which are characterized by a concentration in one place of a few or up to several hundreds of land parcels which are assigned to individuals or families. These areas often become a destination within the city for not only the gardeners themselves, but friends, families and passersby (Crouch and Ward 1988). Gardening can also provide a way for recent immigrants to integrate into new neighborhoods and become better acquainted with neighbors. In fact, horticulture can form the basis for communication across many diverse cultures (Wekerle 2001).

Local Art Venue

Previously under-maintained parcels which urban gardeners keep free of blight such as broken bottles, used tires and other garbage provide an excellent venue for other beautification projects. Local artists become interested in the possibilities of engaging local youth in art projects onsite.
Aesthetics

In a survey of 4000 members of the American Horticulture Society, over 60 per cent of respondents cited feeling of ‘peacefulness and tranquility’ as the most important personal benefit to be obtained from gardening (Porteous 1996). In a world of concrete, brick, and steel, gardens and parks provide an important visual segue between the raw nature and the man-made world.
Employment

In many cities of the global south, UA represents a significant source of jobs in the local economy. Recent immigrants to American cities who lack the necessary skills to enter the formal economy find that farming uses expertise that is common in the rural areas of their own countries. Hence, these immigrants actually enjoy a competitive advantage over American city residents who have long ago lost farming knowledge. Job training programs in various cities have begun to incorporate farming into their curriculum.

Locally, the Cultivating Healthy Environments for Farmers (CHEF) program aims to recruit and train new urban agriculturalists. Though still in the beginning stages, this initiative led by Findlay Market may be the beginning of a new economic force in the inner city.

Food Security

By 2015 about 26 cities in the world are expected to have a population of 10 million or more. To feed a city of this size – at least 6000 tons of food must be imported each day. (Drescher 2000) The increasing financial and environmental costs of transporting such a vast amount calls into question the sustainability of our existing food system’s ability to provide fresh, high-quality food for all urban residents. UA has the potential to decrease the dependence on that system by increasing food production near eaters.
Participatory Decision Making

Urban Agriculture presents an opportunity for grassroots community development in which gardeners and community members plan and implement aspects of the farming project with very little outside pressure. There are numerous cases of community gardeners coming together to thwart an attempt by an outside entity to meddle in the affairs of the garden.

Social Capital

One of the most important benefits of UA is the role it can play in increasing community control over local food sources and in facilitating the link between food producers and consumers. Indeed, UA has been the catalyst for the development of formal food policy councils, which are ultimately comprised of a variety of stakeholders in the local food system including producers, wholesalers, retailers, consumers and local officials (ETC - Urban Agriculture Programme 2001). By beginning to focus policy on local production and consumption, a number of other issues arise necessitating the input of more and more stakeholders. In this way, the web of what Bolin et al. (2004) refers to as “bridging social capital” expands among a diverse set of food system actors.

Health and Nutrition

The role UA plays in the nutrition of urban residents differs greatly between developing countries and those which have industrialized. In the case of the first, UA has been seen to be the single most important determinant in the nutritional status of children (Maxwell, Levin and Csete 1998). That benefit does not come without risks; specifically the risks of contamination due to
wastewater reuse and lead poisoning due to accumulations of paint residue or diesel fumes in the soil. In the case of more food-secure American cities, UA has not traditionally been seen as a significant contributor to the diets of urban residents. The conjecture that UA should someday replace the rural agriculture as the main supplier of the urban poor has been cast in doubt (ETC - Urban Agriculture Programme 2001, 25).

2.4.3.2 Environmental Benefits

Cool Buildings

UA has the potential to reduce the urban heat island effect by increasing the amount of vegetation in urbanized areas. Brick, steel, and asphalt act as heat sinks by absorbing the heat of the sun during the day and releasing it throughout the evening, therefore increasing the average temperature as felt by city residents. The soil and plants covering one of these areas reduce this “heat island effect” by providing shade. Also, when placed on the roof of buildings, these can insulate the building therefore reduce the energy demands of air conditioning and refrigeration.
Decreased Runoff

Stormwater runoff is a significant contributor of non-point source pollution in the nation’s rivers and streams. As rainwater which cannot percolate into the ground, but rather washes across roofs, pavement and even well-manicured lawns\(^4\), it takes with it pollutants such as motor oil, plastics, and chemicals. Moreover, in heavy rainfall events older cities such as Cincinnati without dedicated storm sewers are subject to what are called Combined Sewer Overflows. By reducing the amount of impervious surface and/or collecting and storing rainwater for later use, UA can help to reduce the amount of runoff in the city.

Biodiversity

By increasing the habitat for animals and insects, UA contributes to the strength and diversity of urban natural life. Also, many vacant or abandoned urban lands have become overgrown with non-native invasive species (Cincinnati has problems with both honeysuckle and English ivy). Through habitat restoration (i.e tearing out the invasive plants) and careful propagation of native or at least non-invasive species of edible as well as non-edible plants, urban farmers can begin balance back to urban ecosystems.

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\(^4\) Especially during heavy rainfall, grassy lawns can be nearly as impervious as concrete. Plants with deeper root systems and increased spacing are best at storing or allowing rainwater to percolate and eventually recharge underground aquifers or slowly seep into nearby waterways.
Air Quality

An increase in the amount of trees and other large deciduous plants can have a large beneficial effect on the quality of the surrounding air. By inhaling carbon dioxide and other gases (ozone, carbon monoxide, and sulfur dioxide), tree leaves can improve the breathing conditions for urban residents. Leaves also filter the air by removing dust and other particulates. Rain then washes the pollutants to the ground.

Soil Remediation

Urban farmers are often forced to begin projects on poor urban soils. Through a variety of composting and remediating techniques, UA has a tendency to naturally increase the nutrient content and aeration of the earth around the growing area.

2.4.4.3 Other Benefits

Green space

An increased amount of green space in dense urban environments allows for increased recreation opportunities for residents, which in turn can greatly increase neighboring property values.
Fewer Food Miles

By reducing the distance food travels between producer and consumer, UA can decrease the energy needs of transportation and refrigeration, while at the same time increase the freshness and, some say, the nutritional value of the food. There is an educational value in children and adults seeing firsthand from whence their food comes.

Farmland Preservation

With urban sprawl taking over many cities in the United States farms set in predominantly pastoral settings can quickly become threatened by more economically remunerative land uses. By increasing the intensive of cultivation, farmers can begin operating on a UA model by increasing crop diversity and tapping into the urban direct marketing scheme. There is another argument that by preserving large open spaces inside cities UA is decreasing densities and therefore pushing housing and other development even further from the center of the city – in other words, it is worsening the leapfrog effect.

2.4.4.3 Economic Impact

By most indicators, the national and international economies are in recession. Newspaper headlines are daily bemoaning the “mortgage crisis”, the “financial meltdown”, and unemployment rates unseen in decades. Like many other post-industrial rust belt
cities, Cincinnati is having difficulties finding a niche in the globalized economy. Unemployment stands at nearly 9 per cent in the city, which is nearly the same as the national average (Cincinnati USA Regional Chamber 2009).

Downturns in the economy can often provide an opportunity for a reprioritization of the workforce. Generally, a healthy local agricultural economy can benefit a city and region’s economy by circulating dollars locally, and therefore providing a multiplier effect instead of that money going to distant agricultural regions (i.e. California or Chile). The farms or gardens that are developed in and near a city also rely on other industries for inputs such as soil amendments, tools, and packaging.

There is also a positive fiscal impact to city budgets of reusing urban land for agriculture. When compared with the prospect of continuing decreases in tax revenue due to vacant or foreclosed properties, using land for the purposes of agriculture, while not as fiscally beneficial as another commercial land use, is more sustainable than others and certainly better than nothing.

An empirical study of the economic impact of UA can be essential to the survival of the activity when it is threatened by economic or political opposition – however it is also the most intangible type of study. Urban and Peri-urban agriculture often faces an audience doubtful of its contributions and its sustainability, and is only recently being analyzed in ways that can reveal its value to households and communities (ETC - Urban Agriculture Programme 2001).

Most economic impact studies of UA are produced by casual observation or by limited survey methods (RUAF 1999). A few studies exist that have drawn from statistical methods to derive figures (UNDP 1996) or gathered information from primary data sources (Nugent 1999). The problems of a lack of uniform conditions, multiple definitions, and differing spotlights have resulted in the literature on UA consisting mainly of case studies (ETC - Urban Agriculture Programme 2001). City case studies generally focus
on a number of aspects of UA - generally those that are of particular importance to the writer and to the specific circumstances of the city being studied. A Philadelphia study, for example, found that the mean economic value of community gardens in one season was $161 (Blair, Giesecke and Sherman 1995). A very small number of studies attempt a categorical review of all the positive and negative impacts that UA creates in the urban context. The net product of the case studies is to create confusion about the economic impact of UA since UA itself differs widely by city, and because the methods used in the case studies vary and are often not clearly described (ETC - Urban Agriculture Programme 2001).

![Figure 7: Cost-Benefit Analysis (Source: ETC)](image)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Output</td>
<td>Land</td>
</tr>
<tr>
<td>Economic Diversity</td>
<td>Water</td>
</tr>
<tr>
<td>Indirect Economic Activity</td>
<td>Labor Time</td>
</tr>
<tr>
<td>Recreational Activity</td>
<td>Seeds and Plants</td>
</tr>
<tr>
<td>Food Security Benefits</td>
<td>Tools and Equipment</td>
</tr>
<tr>
<td>Dietary Diversity</td>
<td>Energy Input (fuel and electricity)</td>
</tr>
<tr>
<td>Community Cohesion and Security</td>
<td>Environmental Degredation</td>
</tr>
<tr>
<td>Environmental Improvements</td>
<td>Health Risks</td>
</tr>
<tr>
<td>Health Benefits</td>
<td>Chemical Inputs</td>
</tr>
</tbody>
</table>
Few communities are prepared to expend the resources and time, nor do they often have the specialized skills necessary, to conduct a full economic impact analysis of farming activities done in the city. In North America, issues surrounding UA have not risen to the level of concern among local or national policy-makers that would warrant such an information-gathering and analysis effort (Nugent 1999).

According to Nugent (ETC - Urban Agriculture Programme 2001, 134-136), the most glaring gap from the contemporary literature on the economic impact of UA is computation of important economic variables: income, employment, annual output. Closing this gap will require progress toward a common definition of UA, continued progress on methodology appropriate to UA, and researchers who can devote significant time and effort to produce thorough empirical case studies that can serve as models.

2.4.4 Example Case Studies

Since the 1970s the P-Patch program in Seattle has been planning, implementing, and promoting community gardening throughout the city. More recently, through the use of a Community Supported Agriculture (CSA) model, the Cultivating Communities program aims to increase food security and self-sufficiency among recent immigrants living in public housing. The program includes a score of community gardens available for residents of public housing and three CSA ventures. In 2000, the CSA’s achieved $30,000 in produce sales from 150 subscribers, fed 40 growers’ families with organic vegetables, and paid each family $500 for the year for their efforts (Balmer 2005). As in the case of Cincinnati, the P-patch program has no direct link between urban food
deserts and the choice of plots. However, there is an emphasis placed on the selection of community gardens in or near public housing complexes which - because of the poverty of the residents - may also experience problems with access of full-service grocers.

In 1999, the Food and Hunger Action Committee was created to research food security in Toronto. This joint group of city staff, councilors, and citizens has published numerous reports, created the Food Charter and Food Security Action Plan, which recommend actions for expanding urban agriculture. Both documents have been endorsed by Council (TFPC 2006).

Toronto’s Official Comprehensive Plan contains several references to food security and community gardening, as well as to the Food Charter and Food Security Action Plan. In 1999, the Community Garden Action Plan aimed to create a community garden on parkland in every ward of the city by 2001. However, by 2003 nearly half of the city’s 44 wards still did not have a community garden (City of Toronto, 2003).

City Fresh is a comprehensive urban agriculture and nutrition initiative spearheaded by the New Agrarian Center and Ohio State University Extension. In an effort to meet the goal of building a more just and sustainable local food system in Northeast Ohio, one program of particular interest is called Fresh Stops. Fresh produce is picked up directly from participating urban and rural farmers and taken to “Stops” located throughout the city, but focused on neighborhoods lacking in retail sources of fresh produce. In addition to a wide array of local, seasonal vegetables and fruits, customers are given information on the benefits of a nutritionally balanced diet. The stated benefits of the programs include: fresher food with better taste, recirculation of dollars within local
economy, maintaining farmer’s livelihood, building synergies between urban and rural communities, and reducing fossil fuel usage in transport and production of foodstuffs (Ohio State University Extension 2008).

2.5 Keywords

food security, food deserts, city farming, urban agriculture, nutrition, organic agriculture

2.6 Definition of Terms

Full-service grocery: The Standard Industrial Classification of the U.S. Department of Labor defines Grocery Stores (5411) as:

“Stores, commonly known as supermarkets, food stores, and grocery stores, primarily engaged in the retail sale of all sorts of canned foods and dry goods, such as tea, coffee, spices, sugar, and flour; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry.” For the purposes of this report, I do not include convenience stores, corner stores or other similar retail establishments with limited or non-existent sales of fresh fruit, vegetables, or meat.

Urban Agriculture: defined by the UNDP (1996) as “an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock.” A large variety of methods ranging from community and back-yard gardening to aquaculture and food-producing green roofs comprise UA. Food composting, fruit trees, edible landscaping, and bee keeping can also be considered.
**Food Desert:** is defined as a district with little or no access to foods needed to maintain a healthy diet, but often served by plenty of fast food restaurants.

**Network Distance:** the term refers to the lowest value distance measure between pairs or lists of points (generally network nodes or points upstream and/or downstream in hydrological applications). Typically the network is a logical collection of linked polylines, joined at network nodes (or vertices), and possessing a network topology (sometimes called a geometry).

**Food System:** a set of interdependent and linked activities that result in the production and exchange of food. The activities include farming, packing, processing, packaging, storing, distributing, and selling food (Herrera 2006).

**Parcel, Lot, and Plot:** All three are used interchangeably in this document to mean a unit of land held by one owner – which, in this case, is most often the City of Cincinnati or its various subdivisions.

**2.7 Closely Related Topics**

Providing a healthy, equitable, and sustainable local food system for its citizens is no less important a task for municipalities than providing affordable housing, efficient transportation or aesthetically pleasing parks and other open space. This paper assumes that the production and processing of food within the city is a key component of that food system and that urban policy makers would
be remiss to ignore it. A number of planning professionals and scholars are beginning to write about the role of planning in the food system (Pothukuchi 1999, Mendes 2006).

In 2007, the New Oxford American Dictionary featured as its ‘word of the year’ a noun used to describe a new type of eater; Locavore is loosely defined as a person who makes a conscious choice to consume food products from the area immediately surrounding their community (Oxford University Press 2007). It is widely assumed that sourcing ingredients locally will reduce the energy consumed in their transportation, support the viability of local farms, and ensure freshness in the product. The typical size of a ‘food shed’ varies from a 50 to a 250 mile-radius from home depending on the area of the country and the level of commitment of the eater (Margot 2006, Kingsolver 2007).

2.8 Contribution to the Literature

It is evident that City Council members – by passing the resolution unanimously – recognize the benefits that vacant lot urban gardening can bring to Cincinnati. This thesis hopes to better focus stakeholder attention on those areas of the city which could most benefit from the increased access to fresh foods. Moreover, by recreating the methods and benchmarks used in this study to detect the presence of food deserts, researchers can later determine the impact the Cincinnati Farms program may have had on a neighborhood.
Chapter 3: Methodology

3.1 Previous Food Desert Studies

Mari Gallagher is arguably the most prolific researcher of food desert prevalence in American cities. Her method consists of creating a Food Balance Score by calculating the average distance from a Census block centroid to any “mainstream food venue” (healthy grocery outlet) and dividing this by the average distance to a “fringe food venue” (fast-food restaurant or unhealthy corner store). Subjective criteria were established to sort the venues into mainstream and fringe. Also critical to this method is the weighting of the scores by population density within each Census block. The benefit of Gallagher’s method is the ability to compare the saturation of good and bad food options within a specified proximity of an area. By using Euclidean (straight line) distances, this method ignores geographical barriers to food access such as highways, water bodies, steep hills, or areas lacking in road access.

A study conducted in London, Ontario, Canada used only supermarkets as access points for healthy food (Larsen and Gilliland 2008). Using Network Analysis in ArcGIS, service areas of 1000 meters were drawn around the supermarkets. In addition, bus routes were used to determine access via public transit. Bus access was determined by using a 10-minute no-transfer ride combined with a 500-meter walk (network distance) at the beginning and/or end of the bus trip. This study also determined the
minimum distance residents must walk to the closest supermarket and aggregated data to the Census Tract level for further analysis and to allow for comparison with socioeconomic characteristics of neighborhoods.

<table>
<thead>
<tr>
<th>Stores studied</th>
<th>Gallagher Study</th>
<th>Larsen Study</th>
<th>This Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categorize between “fringe” and “mainstream” food venues</td>
<td>Only “Full-Service” supermarkets as defined by food retail census</td>
<td>Only “full service” groceries defined as well-known corporate chains</td>
<td></td>
</tr>
</tbody>
</table>

| Method                    | Determine distance from each block centroid to both fringe and mainstream plus density to find a score for each census block | Determine walking and transit distance from each census block centroid to nearest supermarket, then aggregate to census track level (1 km service area) | Determine walking and transit distance for whole study area to determine areas of no access (500 m service area) |

| Additional Considerations | Socioeconomic data and car ownership data by neighborhood | Location of potential UA projects |

| Result                    | A score for each neighborhood; color coded map             | Average distance for each neighborhood to nearest supermarket plus socioeconomic correlation | Map with food deserts drawn and potential UA illustrated |

*Figure 8: Comparison of food desert studies*
3.2 Study Area

This study aims to find the areas within the city of Cincinnati which have a lack of access to full-service grocers. By limiting this study in this way, it allows for a more focused analysis of the program which was intended to be mono-jurisdictional. Time and resource constraints are weighed on this decision. Census blocks located within the Cincinnati incorporated area as defined by the CAGIS layer file cintibnd.lyr will be studied.

To determine fresh food availability, grocery stores which meet one of the following criteria will be considered:

- located within the city boundaries;
- located no more than 500 meters “network distance” from the Cincinnati incorporated boundary - the assumed maximum distance a customer is willing to walk; or
- located no more than 500 meters “network distance” from a bus line and within 3 miles of the incorporated Cincinnati area.

3.3 Data

Locations of brand-name full-service grocery stores (Kroger, Bigg's, Save-A-Lot, IGA, etc.) were determined through the use of Internet-based business directories, company websites, and direct phone calls. In addition, a number of retailers meeting the definition of full-service grocery store. Those found within the city boundaries or otherwise meeting the above criteria were retained and the rest eliminated. This list of geocoded stores formed the inventory of the available food outlets.
All demographic information used in this thesis was found using U.S. Census TIGER/LINE data available free-of-charge through ESRI. The most recent data available at the census block level was current in the year 2000. Demographics may have changed significantly in that time, however, accurate population statistics are not necessary to answer the research questions of this thesis.

Finally, the locations of parcels proposed for the Cincinnati Farm Program were sourced from the city parks department. Over the course of the negotiations among city department which control the various vacant parcels, the official list of those available to the program changed frequently – gradually decreasing in number as certain parcels were eliminated by one agency or another. For the purposes of this study, I have used the list of 15 parcels which were under consideration for final approval in March of 2009.

3.4 PART I: Locating Food Deserts

Gather Supermarket addresses

Addresses of full-service grocery stores were gathered from local business directories and verified using several additional sources: telephone directories; company Web sites; inspection of air photos and maps; phone calls; and site visits.

Geocode

Using ArcGIS 9.2, the exact coordinates of the grocery stores was determined and manually reviewed to ensure precision.
Determine network access

Using US Census data, this project will calculate each census block’s access to grocery stores using practical criteria, particularly 500-meter network distance (7- to 10- minute walk depending on topography) from block centroid to grocery store. If the centroid of a particular census block falls within the above areas, the population of that block will be identified as having supermarket access.

Determine bus access

Through the use of ArcGIS 9.2 it has been possible to locate the areas of the city in which a non-car-owning household would find it difficult or impossible to reach a full-service grocery store. The assumption here is that the only affordable options remaining to gain access to the convenience of a grocery store are walking and public transit. The ability to travel on foot is limited by the coverage of roads and the endurance of the walker.
Figure 9: Example Walking and Transit Access

The public bus operated by the Southwest Ohio Regional Transit Authority (SORTA) is essentially the only form of public transit available in Cincinnati. The one exception is the paratransit service (also operated by SORTA) that offers curb-to-curb service for persons with disabilities. Therefore, the limitation for the grocery buyer not meeting the qualifications for paratransit to reach a store is a factor of the location of regular bus stops and the reach of the bus routes themselves. In addition, the frequency
and hours of service can also be a factor to consider, but I have not taken this into consideration here except in the case of express service buses. These limited-service buses are designed to service commuters travelling to and from the central business district from the suburban areas, and as such operate on a limited schedule during morning and evening rush hours and stop at very few places. Since these are not practical for grocery shoppers, they have been eliminated from this analysis.

Because of the steep hillsides, large parks and cemeteries in Cincinnati, there are a number of areas where population density is extremely low compared to most urban areas. As expected, these areas with very low population density and limited road access, appear in the analysis to be food deserts and though they match the definition, these areas are of less concern than large population
centers which lack access. This must be taken into account when determining where to focus resources toward ameliorating the deserts.

This project uses information on Cincinnati’s public transit network to determine accessibility by city bus. Out of the 43 active routes in the system, 13 were eliminated either because they did not stop within the required 500-meter walking distance of a store or they operated on an express schedule. The latter, by operating only during morning and evening rush hour and only in one direction at a time do not provide a reasonable means of travel for grocery shopping. Network Analyst was then used to select and map individual bus routes that are located within 500 meters of each supermarket; a 500-meter network service area was created around each stop of the remaining 30 bus route to determine areas with public transit access to grocery stores. If the centroid of a particular census block falls within at least one of the above areas (bus access of pedestrian access), the population of that block was identified as having supermarket access.

3.5 PART II: Match Proposed Lots with Deserts

- Import layer with Cincinnati Farms project proposed lots (n = 15).
- Determine network access of the plots using above methods.
- Identify those whose “service areas” overlap with identified food deserts.
3.6 PART III: Identify Alternative Vacant Lots

- Map all vacant parcels in CAGIS database
- Select samples from those located near center of food desert.

Expected Outcome

It should come as no surprise that the majority of the food deserts are to be found in low-income areas around the city. These neighborhoods are also likely to have a large proportion of vacant lots upon which UA may be appropriate. However, because of the age and formerly-industrial uses of some of these parcels and their adjacent buildings, heavy metals and impacted soils are likely to make in-ground gardens impractical. The cost of soil remediation is likely to be prohibitive especially for low income communities. Food production to alleviate localized food insecurity in the city was not a criterion the officials used in selecting lots for the Cincinnati Farms program. Hence, the overlap will be coincidence. There is a significant likelihood that certain parcels may have been eliminated as potential lots based on remote sensing data (i.e. satellite photo-derived tree cover); these same parcels may have indeed been ideally located to produce food for the neediest areas. It is hoped that the outcome of this study will be able to add another layer to the decision-making process - giving more weight to well-located parcels.
Chapter 4: Analysis

4.1 Part I

Where are the food deserts in Cincinnati?

The largest area food deserts as evidenced by the map (Figs. 10) are located in the neighborhoods of East End, California, Hyde Park, Mt. Lookout, Clifton, West Price Hill, Hartwell, and Winton Place. The map in figure 6 shows the population density in each of the census blocks of the various food deserts. The food desert census blocks west of Interstate 75 tend to be the densest. This is where attention should be focused.

After adding up all census blocks whose centroid is outside of an area of access (i.e. majority of the block is in a food desert) the result is nearly 108,000 population out of a total of 332,000 for the total city population (U.S. Census Bureau 2008). This represents nearly 33% of the city’s population living in areas with no walking or transit access to full-service grocery.
Figure 10: Map of food deserts throughout the city.
Figure 11: Map of food deserts by census track and density (pop per square kilometer).
4.2 PART II

Are any of the proposed parcels for the Cincinnati Urban Farm program contained within the food deserts identified?

There are a total of four proposed pilot garden plots (made up of six parcels) contained within the large food desert in the neighborhood of California (Fig. 13). But generally, the proposed plots do not overlap with the food deserts found in this study. As can be seen in Figure 8, a significant number of the proposed plots are congregated on the west side of the city. Since, this is also an area where many food deserts are prevalent it would seem likely that some of the proposed plots would fall within a food desert area. Unfortunately, that is not the case. Several plots are perhaps within walking or bussing distance to the border of a food desert, but in order for the UA project to have the most effect it would need to be placed near the centroid of the food desert.

Though the program did not set out specifically to address food deserts with the location of the proposed urban farms, it did have as a goal to increase the availability of “fresh local foods” and one could expect that chance alone would have placed more than four plots within the food deserts. But, the conclusion evident in this thesis is that not enough of the proposed parcels are located within food deserts (especially on the food-bereft West side) for the program to have much impact on the food desert problem.
Figure 12: Map of the vacant lots around Cincinnati proposed as urban gardens.
Figure 13: Map of neighborhood of California with nearest grocery store
4.3 PART III

If the focus of the City pilot program were on increasing food security in the deserts, which parcels would be best candidates?

It is not within the scope of this thesis to complete a thorough suitability analysis for all vacant lots within the city. Therefore, the vacant parcels that are proposed in this section may not be ideally suited for gardening. Qualities such as steep slope, road access, tree cover, and water access should be taken into account when deciding on the suitability of a site.

A total of 2938 acres (4.6 sq. miles) of vacant land (in 4381 parcels) lie within the food deserts in the city of Cincinnati. This is a combination of public and private land. The Cincinnati Farm Program has been limited to leases on city agency-owned parcels (i.e. public lands). However, if the city were to amend the current program to include policies similar to those of the P-Patch program in Seattle, it would allow the city to facilitate leases between private land holders and prospective urban farmers.
Figure 14: Map of all vacant parcels located within a food desert
Figure 15: Map of food deserts and vacant parcels on west side of the city
Chapter 5: Discussion & Conclusion

This thesis answers the question of whether the new city program to lease vacant parcels of land for UA has the potential to fill the gaps left behind by urban food deserts. Using a simple network analysis of walking and transit service areas, I have identified areas where access to a grocery store is limited to only those residents with access to a car. Similar to other studies (Mari Gallagher Research & Consulting Group 2008, Larsen and Gilliland 2008), I find that there is a significant portion of the city’s resident that lack access to the benefits of a full-service grocery store.

Considering the problems with the existing food system – whether one focuses on the environmental impacts of feed lots (Pollan 2008), the consolidation of food production into the hands of fewer and fewer corporations (Roberts 2008), or the market failures leading to large food deserts in cities across the country (Economic Research Service 2000) – the time for reform is upon us. Short of revolutionizing the food system, there are a number of small reforms and circumventions of the current system that are possible and could make significant steps towards improving access.

Admittedly, this thesis did not examine the prevalence of small grocery stores, convenience shops or even farmers’ markets (except the large ‘Findlay Market’ in the Over-the-Rhine neighborhood.) Though there is no guarantee that these retail
establishments would carry a selection of fresh and nutritious food and it is likely that the prices would be higher, these stores may provide food stuffs for a good number of households living near them. Hence, these stores likely provide some relief in areas identified herein as food deserts. There is a need for extensive research into the offerings of these various establishments around the city. Since these stores are already present in the neighborhoods, it may be more effective to work with shop owners to increase their stock of fresh healthy goods rather than attempting to attract a full-service grocery store to an area which may or may not be able to support it.

There may be a potential to increase access to existing full-service grocery stores through changes or additions to the public transit service. This could be especially effective in certain high-density food deserts in neighborhoods such as West Price Hill. Food deserts large in size, but sparse in population in neighborhoods such as California, however, may be more difficult to mitigate through the addition of a transit line – considering that these require a certain ridership to justify additional routes.

**Economic Considerations**

The underlying focus of this thesis has been on the benefits of intensive urban agriculture. In addition to environmental benefits of a re-localized food system which reduces the distance food must be transported, UA can also create jobs, and of course, increase the food security of neighborhoods.

So, what is the potential food production for the vacant lands within the food desert of Cincinnati? According to Will Allen, founder and CEO of Growing Power in Milwaukee, Wisconsin, his urban farms are able to sustain a profit of $5 per square foot per
year under intensive cultivation. For sake of argument, let us conservatively estimate that half of the vacant land within the food deserts of Cincinnati is cultivatable (in-ground, in "raised beds," or another method). That would signify 63,989,640 square feet, which multiplied by $5 gives us $319,948,200 worth of profit from agricultural production within the city limits. It must be noted that this is profit from the production and sale of the agricultural products, and not the actual value of these products. We shall assume that the value of these products is at least as high as the profit margin on them.

It is instructive then, if we use the USDA Economic Research Service (ERS 2003) estimate for food expenditures per capita of $40 per week. Using these figures one arrives at the sum of yearly food expenditures per person of $2080. The 108,000 Cincinnatians living in food deserts consume roughly $224,640,000 in food every year. Hence, food deserts themselves could likely produce 142% of the food necessary to feed the people within those deserts.

It can be assumed that a significant number of jobs would be created in order to staff the farms and distribute the product around the city. The number of these depends heavily on the agricultural methods employed. Generally, UA is a more labor intensive business than its highly mechanized and large-scale rural counterpart. A simple calculation using the above numbers on potential profit, and assuming an equitable distribution of the proceeds of these profits to laborers and direct managers, we can surmise that over 10,000 jobs paying $30,000 per year could be created.

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5 Allen’s methods of UA include extensive compost operation, usage of every square inch of land, year-round production, and the grouping of symbiotic plant and animal production (such as indoor fish farming with water chestnuts).
6 This figure is an average total for each person in a household. It includes both foods eaten at home ($25) and away from home ($15). The incremental cost per person is reduced for households with more eaters.
By sustaining themselves, the former food deserts would negate the need for large retail groceries and the concomitant distribution chains. Furthermore, food grown in the city could be exported to areas immediately surrounding. Taking into account the recent craze over locally grown agricultural products, it is likely that the demand for such products would be high enough, and producers could expect higher prices for their products if marketed correctly. The wealthy suburbs around Cincinnati are not immune to this craze. Indeed, areas with high amounts of disposable income coupled with health and environmental consciousness would pay the highest prices and would therefore be the first group targeted by new urban agriculturalists. And this brings us to the first of the problems with such a system.

The premise that for-profit UA practiced in food deserts can improve access to fresh fruits and vegetables in those same areas may prove to be false. Food deserts tend to be areas consisting of low-income demographic groups, and a case could be made that low income groups tend to be less willing and/or less able to pay a premium for locally-grown fresh produce or other agricultural products versus those found in the supermarket. Products grown in UA, because of the labor-intensive nature, are inherently more expensive. Growers are going to flock to the area of the city where their product can sell at the highest price possible or else sell to high-end restaurants for the same reasons. Moreover, the agricultural products with the highest profit margin are specialty crops (e.g. exotic vegetables, herbs, and meats) that can be sold to fine dining restaurants or more exacting high-income families. In other words, urban farmers are not likely to sell inside the food desert, but will instead attempt to market their products in higher income areas where access to fresh fruits, vegetables, and proteins is less of a problem because of the prevalence of full-service grocery stores and car ownership.
If for-profit UA will not ameliorate food deserts, then perhaps community gardening can be of more help. In fact, many of the social benefits of UA mentioned before are more pronounced in non-profit gardens. Certainly, benefits such as social cohesion, participatory decision making, and increased public health due to outdoor exercise are best enjoyed when profit is not the motive. Neighbors become better acquainted with one another, trust develops, and communities can become revitalized. However, the financial sustainability of a community garden will always rely on the williness of volunteers and the beneficence of municipal governments, philanthropists or other civil organizations.

UA certainly has a role to play in plugging the holes of the current food system. Its success in doing so relies on a variety of factors, the price of fuel for transportation being prominent among them. As the cost for transporting fresh produce increases, the comparative advantage due to efficiencies of scale for large producers far from Cincinnati decreases. Additionally, success hinges upon things such as the ability of full-service grocers or corner stores to adapt to the changing market landscape, the prominence food deserts take in the public health political arena, the trends in density in the city (affecting land prices), the cultural renaissance gardening may experience (using example from England or Germany where even the rich garden as a hobby) Ultimately, urban agriculture is likely to be a significant part of the sustainable restructured food system.

A municipal government ensuring land tenure for UA, either through a program similar to Cincinnati Urban Farm Pilot program or something more comprehensive as is done in Seattle, can be a recipe for success. The next step would include providing financial resources to purchase materials, assistance with water access, and/or coordinating distribution of the produce to consumers.
Considering that the Cincinnati program is in the pilot stage, adjustments can be made in subsequent years taking into account the successes and failures of this one. Since the program did not have benchmarks or goals set out from the beginning, it will be difficult to measure success without first determining what the program intends to do. If the main purpose of the program becomes increasing access to fresh fruits and vegetables in areas underserved by retail grocery establishments then this thesis will be instructive. In addition to characteristics such as slope and tree cover, a future suitability analysis of vacant lands could include a provision for location in a food desert.

**Conclusion**

Unfortunately, the Cincinnati Urban Farm Pilot Program was not designed to ameliorate areas lacking in food access. Since this was not a consideration, it should come as no great surprise that the proposed vacant parcels do not fall within food desert as these are defined herein. Any overlap would be incidental. That said, there is a potential to use the plots proposed in the California neighborhood to help increase access to fresh fruits, vegetables and possibly proteins (fig. 13). The density of this food desert is relatively low, but the distance to the nearest full-service grocery store (4 miles network distance) and the absence of transit routes signifies that zero-car households would not feasibly be able to access a full service grocery and hence may benefit from produce grown and sold directly in their neighborhood.
The food system in the United States (ignoring for a moment that it is part of a larger global system) is characterized by overproduction of monoculture feed crops by a decreasing number of farmers on lands farther and farther from centers of population and a long distribution chain which - despite itself - results in many Americans unable to access a healthy diet. There is a significant amount of reform that needs to be carried out at the federal level to even the playing field for small and medium-sized farmers producing a variety of crops organically near cities - the commodity crop subsidy system chief among them.

Many of the solutions proposed by experts and advocates focus on the idea of a more regionalized food system which can protect valuable farmland near cities, reduce the distance food travels and return to more organic methods of production. This is contingent on American’s willingness to pay extra, cook more, and become more cognizant of the source of their food. It would also necessitate a return to seasonal diets (i.e. eat asparagus only in spring months and squash only in summer and fall) and to less convenient multi-stop shopping (i.e. separate trips to the butcher, the farm-stand, and the dry goods store). These changes in lifestyle are more difficult for the average consumer than what the current system provides. However, when observing record national rates of obesity, the decline in rural and peri-urban agricultural economies, and the environmental degradation related to petro-chemicalized food production, it would seem that the time for reform has arrived.

The first step for cities and the urban planners working for them is to provide a healthy food environment - which includes land where community members and perhaps entrepreneurs can practice agriculture. Finding ways to encourage people to take advantage of that environment is a challenge for another thesis. Cities must also ensure that other barriers to UA are taken down:
• Ensure the zoning and building codes do not limit the production, distribution or sale of produce in the city. This includes allowing fencing, compost bins, water tanks, etc.

• Provide and/or allow outlets such as farm stands or mobile markets to be set up, especially in food desert neighborhoods.

• Develop a mechanism for leasing private and public land for the purposes of urban agriculture. A minimum guaranteed tenure of three years is necessary to incentivize farmers to make time and resource investments into a plot of land.

• Remove barriers to access to water. For example, though permits are temporary fire hydrant tapping permits are regularly issued for construction projects, but the same is specifically disallowed for any agricultural purposes.

• Launch a public education campaign around the value of gardening in the city – emphasizing both the economic and social benefits.

Recommendations for future study

There are many other facets of UA and food desert that could further enrich the repository of literature developing on the subjects.

• A more comprehensive suitability analysis (similar to Balmer et al.) specific to the Cincinnati area and taking into account food deserts. Other intended goals could also influence the decision making process regarding location of parcels: using unemployment rates to target areas in most need of job creation benefits of UA.
• An inventory of the corner stores and small markets which are found throughout inner-city neighborhoods including an assessment of the prevalence of fresh produce.

• A follow up of the Cincinnati Urban Farm Pilot project including an analysis of its goals and success after a number of years.

• An examination into the decision making process that led to the Pilot Program as it currently stands. This could analyze the communication channels between City Council and City Manager’s Office. How was the suitability analysis established?

Critique of the Study

Like every piece of research, this thesis has strong points and weak points. I can understand how it may be difficult for some to see the direct connections between the larger “broken” food system and urban agriculture, which I demonstrate here as one way to circumvent that system.

Methodologically, the study relies heavily on second-hand sources for the data used to find food deserts. More detailed information on the location and types of retail food establishments is available from commercial vendors, however, I chose not to spend the resources, and instead used the much simpler and possibly less reliable business directories. It would also have been possible to conduct first-hand surveys of all grocers in the city – though time and labor would have constrained me. Another layer of information which would have further reinforced the food desert analysis would have been car ownership data by neighborhood or census tract, though the scale of this data would not have matched the street-level food desert analysis.
Generally, I feel the information and conclusions contained herein should give future researchers and policy-makers a rough sketch of the problem of food access in Cincinnati and at least a peak at the potential for UA as a solution.
Bibliography


New York Association for Improving the Condition of the Poor. 1898. "Cultivation of Vacant Lots by the Unemployed." AICP Notes.


Motion

We move that the Administration shall publish a list of all parcels owned or controlled by the City for which there is no current use and no interested buyer.

We move that these lands be offered at nominal cost to residents who will agree to farm or garden the land and maintain it as a source of fresh or clean food.

We further move that the Administration shall report to Council in 1 month on its plan to implement the Cincinnati Farm program.

Statement

The City owns or controls thousands of parcels of land in the City for which there is no current City purpose, many of these parcels having no development potential because of their small size and irregular shape. Many City residents would appreciate having the use of a parcel of land for vegetable gardens, flower gardens, rain gardens, or neighborhood beautification. Some City residents would also be interested in earning a living through sustainable urban agriculture, producing food on land that is currently idle and selling it to residents through local farmer’s markets. The use of idle City land for gardening and farming would yield multiple benefits, including beautifying the City, improving the availability of fresh local foods, supplementing the diets of local residents, reducing storm water runoff, reducing the City’s costs to maintain vacant properties, and creating local jobs.
City of Cincinnati

January 7, 2009

TO: Mayor and Members of City Council

FROM: Milton D. Dohoney, Jr., City Manager

SUBJECT: Cincinnati Farm Program

REFERENCE DOCUMENT #2009/1277

At its meeting on October 22, 2008, the Finance Committee referred the following item for report:

MOTION, dated 10/22/2008 submitted by Vice Mayor Crowley that the Administration staff publish a list of all parcels owned or controlled by the City for which there is no current use and not interested buyer. I MOVE that these lands be offered at nominal cost to residents who will agree to farm or garden the land and maintain it free of bright or nuisance conditions. WE FURTHER MOVE that the Administration staff report to Council in 1 month on its plan to implement the Cincinnati Farm program (Statement Attached).

The City Administration has conducted a study of vacant City of Cincinnati owned parcels to determine their suitability for gardening and farming. Staff has used GIS to screen approximately 18,000 parcels and has preliminarily identified 123 parcels for further review and study. The criteria used to select parcels included:

1. Parcels at least .2 acres in size
2. Parcels with low tree canopy cover
3. Parcels with less than 30% slope

Attached for your information is a map that displays the geographic distribution and a list of parcels and the controlling agency.

The Administration recommends that the following process be used to select between 5 and 10 parcels for a 2009 pilot program:

1. Send the attached selected list of parcels to controlling agencies to review to determine current and future needs.
2. Hold internal meeting with field, OPR, and departments responsible for parcels to determine management criteria and some logistics.
3. Hold public meeting in January to gauge public interest and program direction.
4. Identify users/stakeholders/partners.
5. Develop policy.