Watering the Food Desert: A Policy Analysis of Urban Food Access Disparities in the Lower Ninth Ward, New Orleans

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Abstract

In major cities across the United States, low-income, minority neighborhoods are faced with significantly limited access to affordable, nutritious foods. Scholars and policy makers have used the term "food desert" to describe these areas where the low availability of healthy foods has resulted in serious public health and economic consequences. In this paper, we conduct a policy analysis examining two potential solutions to the national food desert problem using the Lower Ninth Ward of New Orleans, Louisiana as a case study. We have selected this neighborhood because it presents an extreme case of food access insecurity in a predominantly black, low-income community that is particularly susceptible to economic hardships in the years following Hurricane Katrina. The two options that we examine for improving healthy food access in the area are: (1) attracting a corporate supermarket retailer; and (2) developing a local food system in the form of farmers' markets, community supported agriculture, and community gardens. We will evaluate which alternative would most successfully achieve the policy objectives of improving public health, economic development, social capital, and environmental quality in the community. We also consider the general feasibility of each policy solution in regards to potential costs and cultural fit. Ultimately, we argue that the development of a local food system would serve as the most effective and feasible policy strategy for addressing the food desert problem in the Lower Ninth Ward neighborhood.

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The Food Desert Problem in the United States

I. Introduction

In major cities across the United States, low-income, minority neighborhoods are faced with significantly limited access to affordable, nutritious foods. While middle and upper class neighborhoods enjoy an abundance of grocery stores and supermarkets, poor neighborhoods lack market access to fresh produce and other nutritious foods, but play host to a plethora of liquor stores and fast food chains. The significance of these distributional disparities is far from trivial – extensive research has shown that inner city populations suffer disproportionally from a number of diet-related health epidemics, and are faced with oppressive economic circumstances in trying to secure a nutritious diet (Walker et al. 2010; Massey and Denton 1993). Scholars and policy makers have used the term "food desert" to describe these areas where the low availability of healthy foods has resulted in serious public health and economic consequences.

The increasing presence of food deserts raises critical questions about the efficacy, justness, and sustainability of the current food system in its ability to serve the most vulnerable members of society. This issue is of concern to scholars of environmental studies because it highlights an important problem in our current food system that requires a multifaceted, interdisciplinary approach in order to be solved. The food system is one of the principal ways that people interact with and impact the environment. Moreover, the phenomenon of food deserts fundamentally impacts the social, economic, and environmental quality of inner city communities. As the environmental movement has become increasingly concerned with food system dilemmas and with issues of socioeconomic inequality, it is important for scholars and policy makers to think critically about remedies for food deserts in the United States.

In this paper, we will conduct a policy analysis of the food desert problem in the Lower Ninth Ward (LNW) of New Orleans, Louisiana in order to evaluate the potential advantages and disadvantages of two potential solutions. The options we will examine are: (1) attracting a corporate supermarket retailer; and (2) developing a local food system in the form of farmers' markets, community supported agriculture, and community gardens. By evaluating the impacts of these potential solutions, we challenge scholars and policy makers to consider a broad spectrum of factors that may influence a food system policy in a neighborhood such as the LNW. Ultimately, we will argue that a local food system model would address the food desert problem in the most effective and feasible manner in the LNW. While our conclusions may not apply to every community, we believe that by evaluating the dimensions of two policy options, we provide a framework for tackling food access disparities in cities across the country.

II. The Policy Analysis Approach

In order to evaluate potential solutions to the food desert in the LNW, we will conduct a policy analysis, an approach that "determines the most beneficial solution to a broad problem through the deconstruction and weighing of multiple factors" (Bardach 2005). This is the most appropriate method of analysis because it provides a framework for thinking like policy makers to find concrete solutions to real world problems.

Policy analysis is performed in several steps. The process involves defining the problem, gauging its severity with a body of evidence, suggesting alternative solutions, creating evaluation criteria, and finally, deciding on the most effective and feasible intervention given those criteria (Bardach 2005). In this paper, we will follow this process in order to advise policy makers on choosing the option that addresses the food desert problem in the most effective and feasible manner in the LNW. We will draw upon secondary literature to study the impacts of similar

initiatives. Furthermore, we will utilize primary data drawn from personal interviews with various food system experts, local policy makers, and members of the New Orleans community (see Appendix I for a list of interviewees). Ultimately, we will select the policy option that improves access to affordable healthy food and provides the greatest benefit to the LNW.

III. Defining Food Deserts

Current literature on food deserts provides various interpretations of the term, revealing a lack of consensus on a widely accepted definition. In "Disparities and Access to Healthy Food in the United States: A Review of Food Deserts Literature," Walker et al. (2010) note that the term "food desert" was first coined in the United Kingdom in the early 1990s when public concerns surfaced about the social and geographic segregation of retail services. The trend of suburban supermarket expansion depleted city centers of access to fresh food, and inspired a broad field of research surrounding the issue (Massey and Denton 1993).

Some scholars and community advocates suggest that the notion of a food desert fuels the misconception that low-income residents face a complete lack of food, when in reality we see "communities where fresh and healthy food choices are scarce while poor food choices, best symbolized by fast food restaurants and liquor stores that call themselves 'food marts,' are abundant" (Gottlieb 2010). The 2008 US Farm Bill defines a food desert as "an area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower-income neighborhoods and communities." This definition, however, needs further refinement in that it fails to make a clear distinction between absolute and relative deprivation – does a food desert not have enough healthy food options or just less than other neighborhoods?

For the purposes of this analysis, we define a food desert as a low-income area in the US that not only has a low availability of healthy foods relative to other neighborhoods, but that also has such limited access as to hinder residents' ability to consume a nutritiously sufficient diet. Specifically, we employ a definition used by Rose and Bodor (2009) that identifies areas with a poverty rate greater than 20 percent in which items from all six fruit and vegetable groups in the USDA's Thrifty Food Plan (TFP) cannot be purchased from any market within two kilometers. While there are many components of a nutritious diet, fruits and vegetables are certainly a critical component, and thus serve as a useful proxy for healthy foods in general. These criteria provide us with an adequate measure for evaluating a community's relative and absolute lack of access to the products that comprise a healthy diet.

IV. The History of Urban Food Deserts

Food deserts are part of a broader pattern of racial segregation in America's urban communities. In order to contextualize the contemporary food desert problem in the United States, it is important to understand the historical trends, particularly in urban housing development, that have led to grave disparities in food access.

Prior to the 1930s, the US federal government played a limited role in urban housing issues. However, in 1931, President Herbert Hoover made clear his intentions for increasing American home ownership at the Conference on Home Building and Home Ownership. Hoover put forth four recommendations for the future of federal housing policy: (1) creation of long-term, fixed-rate, self-amortizing mortgages; (2) encouragement of low interest rates on residential mortgages; (3) implementation of government aid to increase efforts to house low-income families; and (4) reduction of home construction costs (Jackson 1980).

Soon thereafter, President Franklin Roosevelt continued these trends in federal housing development with the Home Owners Loan Act of 1933. This initiative was aimed at refinancing mortgages that were threatened with default or foreclosure through the Home Owners Loan Corporation (HOLC). Government intervention in the housing market continued with the creation of the Federal Housing Administration (FHA) in 1934. Such programs served to make single-family homes the norm for middle-class America. HOLC supplied upwards of $3 billion in mortgages for roughly one-tenth of all owner-occupied, non-farm residences in the US. After only 25 years of FHA operation, families in owner-occupied dwellings had risen from 45 to 62 percent (Jackson 1980). While these programs helped to raise living standards for many Americans, they also perpetuated patterns of racial discrimination, separation, and exclusion.

Neighborhood "improvement" associations had been in place in major cities such as New York and Chicago for decades. These associations claimed to promote security and increase property values, but in reality, they served to keep white neighborhoods homogenous by preventing black entry into nearby homes through the creation of restrictive covenants between homeowners, city council members, and real estate agents. Zoning restrictions were heavily enforced, sometimes to the extent that cash payments were made to white homeowners in order to stop them from employing black servants or maids (Massey and Denton 1993).

Programs such as HOLC only amplified racial discrimination in the housing market with the use of federal funding. HOLC was infamous for its implementation of "redlining," a discriminatory practice that denied predominantly black neighborhoods housing mortgages. Loans were said to be provided based on the level of associated risk, which was determined by four indexes of neighborhood quality: (1) neighborhoods that were "new, homogenous, and in demand in good times and bad" were considered most desirable; (2) areas that had "reached their

peak, but were still desirable" with high potential to remain stable were considered slightly less desirable, but were still eligible for frequent loans; (3) areas "within such a low price or rent range as to attract an undesirable element;" and finally, (4) areas deemed completely undesirable, were typically "redlined" (Massey and Denton 1993).

The factor that typically made a neighborhood "undesirable" was the presence of racial minorities, and as such, the two lowest quality categories received scarcely any loans from HOLC. In 1951, for example, HOLC gave 44 percent of its loans in New York, New Jersey, and Connecticut to neighborhoods described as "native white," and another 42 percent to neighborhoods described as "native white and foreign." Just one percent of the remaining loans were made in neighborhoods characterized as "Negro" (Hillier 2003). The consistent denial of loans to finance home purchases and home improvements in minority communities led to increased urban disinvestment and a "flight" of white populations to the newly developed suburbs. Starved of capital and investment, inner-city neighborhoods spiraled into decay.

While the American housing market was on a path of continuous transformation and segregation, so too was the food retail industry. The 1930s marked a turning point in the development of large chain stores with the emergence of food retail outlets that sold a wide variety of food types. These "supermarkets," as they came to be known, greatly increased their share of the food retail market, rising from 34 percent in 1948 to 62 percent in 1982 (Desjardins 2010). Across the country, supermarkets consolidated the food retail industry, presenting a considerable threat to the success of small, independent community grocers, and ultimately put many of them out of business. While smaller grocers were typically dedicated to providing culturally specific foods and fostering community relationships, supermarkets focused on maximizing profits, with little concern for local preferences (Desjardins 2010).

Grocery stores in the inner city began shutting down at an alarming rate, abandoning a clientele that had notably less spending power than its suburban counterpart. In Boston, for example, 34 of 50 supermarkets closed between 1970 and 1990; in Los Angeles County, supermarkets dropped from 1,068 to 694 over the same time period (Desjardins 2010). Suburbs were considered more attractive to supermarket retailers than cities due to their "larger, less expensive tracts of land ready to be developed, simplified and business-friendly zoning and other regulations, more homogenous consumer preferences, and less crime" (Giang 2008). Essentially, inner cities were seen as risky places for business due to higher property costs, elevated crime rates, and an overall poorer consumer base. Today, an estimated 23.5 million Americans live in low-income communities with very limited access to supermarkets (Treuhaft and Karpyn 2010).

V. The Importance of Healthy Food Access

Today, the food desert issue has become a prominent area of interest for scholars, policy makers, and community activists alike because of the associated public health and economic ramifications that have been observed in these neighborhoods. On the public health front, research indicates that low-income communities with limited access to grocery stores and greater exposure to fast food and convenience stores suffer significant health problems, as opposed to communities with a higher median income and greater access to fresh fruits and vegetables.

In general, poor access to healthy foods corresponds with poor dietary habits, which in turn leads to poor health outcomes such as obesity, diabetes, heart disease, malnutrition, and more. Linking access and consumption patterns, Morland (2002) finds that African Americans living near a supermarket are more likely to meet dietary guidelines for fruits and vegetables – for every additional supermarket in a census tract, produce consumption rose by 32 percent. Similarly, Moore et al. (2008) find that—even while controlling for variables such as age, sex,

race/ethnicity, and socioeconomic status—adults with no supermarkets within a mile of their homes are 25 to 46 percent less likely to have a healthy diet than those with more supermarkets nearby. Such trends strongly suggest that dietary choices are determined in part by what is available: individuals with an abundance of healthy food options are more likely to develop healthy eating habits than those with limited healthy food access.

Furthermore, research has shown that such limitations on food access and nutritional intake lead to poor health outcomes, while conversely, greater access contributes to lower rates of diet-related disease. For example, Powell et al. (2007) find that an increased availability of chain supermarkets is associated with lower levels of obesity among teens in the US, while a greater availability of convenience stores is associated with a higher prevalence of obesity. A collaborative study between leading research organizations in California shows that rates of obesity and diabetes are around 20 percent higher in lower-income neighborhoods that have a greater density of fast food and convenience stores compared to that of supermarkets and produce vendors (CA Center for Public Health Advocacy 2008). Similar findings, linking the local food environment to diet-related disease, have been shown in research by Morland (2006, 2008), Inagami (2006), Rose (2004), and many more.

Another consequence of food deserts relates to the economic dimensions of healthy food access disparities. From the standpoint of economic inequality, it is important to consider the potential differences in costs that low-income households face in trying to secure a nutritious diet. In neighborhoods with very limited access to supermarkets, local residents are caught in a catch-22 of trying to find affordable, healthy groceries: “living in a food desert raises the cost of access to food, either because of higher prices in corner stores, or because of transportation costs to get to supermarkets” (Rose and Bodor 2009). If citizens try to satisfy their shopping needs at

local corner stores, they will likely face limited options and higher prices for fresh produce or other healthy items that are scarce in these areas. Studies have shown that supermarkets carry a much greater quantity and variety of fresh foods than smaller grocers, and that supermarket prices are much lower than those at small stores (Chung and Myers 1999; Kaufman 1997). Corner stores simply do not benefit from the economies of scale that a supermarket offers, and therefore cannot offer such competitive prices.

Alternatively, residents of food deserts can potentially commute to supermarkets that may be several miles away in the suburbs or wealthier urban areas. However, the costs of transportation may outweigh other savings from shopping at a supermarket. Rose and Bodor (2009) estimate that those living in an area with poor food access that commute by bus to a supermarket more than 2 kilometers away end up paying approximately $34 per month more in transit costs than those with good supermarket access (less than 2 kilometers away). Such costs can become prohibitively expensive over time for low-income households, thus narrowing their choices to the array of fast food and other high-calorie snacks sold nearby.

In a 2009 report, "An Economic View of Food Deserts in the United States," Bitler and Haider describe how in areas with very limited healthy food options, retail firms may have significantly greater market power. As a result, they would have an incentive, and the leverage, to lower the quantity and raise the prices on nutritious food items that are locally scarce. From the standpoint of economic efficiency, this would represent a lack of meaningful competition among retailers, resulting in a deviation from "perfect competition" – in essence, a market failure. However, it is important to refrain from making conclusions about the potential inefficiency of the food retail market without a clear understanding of why the privilege of access has been distributed in the way that it is.

As Bitler and Haider (2009) point out, "very little progress has been made at understanding why food deserts exist; simply noting that certain places have little nutritious food available tells us nothing about whether the underlying causes are related to supply, demand, or both." For example, we can conceive of an area that is devoid of healthy food options because consumers lack information about the nutritional benefits of different foods, thus limiting the demand needed to sustain a supermarket. Conversely, supply factors—such as higher start-up and operating costs for firms in urban areas—can have a direct impact on where a firm decides to locate. Supermarkets generally have very small profit margins, and often cite cost concerns as a barrier to investing in underserved communities (Treuhaft and Karpyn 2010).

One study of supermarkets in Philadelphia found that "there are location-specific cost differences that make creating and expanding supermarkets in urban areas more expensive than doing so in suburban locations." The study found that the costs of employee training, security, maintenance, and property taxes were all significantly higher for urban stores than those in the suburbs (TRF 2010). Whether heightened security in urban stores is a necessary expense or is a manifestation of stereotypes about inner city crime is an important question to explore, but is beyond the scope of this analysis. Regardless, it seems clear that these systemically higher costs can serve as potential "barriers to entry" that discourage supermarkets from competing for business in low-income neighborhoods. In such cases, already established firms, such as corner stores and small grocers, can have appreciable market power, allowing them to reduce selection and increase prices, thus diminishing overall efficiency (Bitler and Haider 2009). While further studies are required to understand the various market forces that serve as disincentives for firms to locate in underserved communities, it is clear that there exist systematic barriers that suppress competition and keep access low in food desert areas.

The problem that exists in cities across the country today is that low-income residents are unable to buy healthy food at an optimal price, and ultimately suffer the health consequences of consuming high-calorie, low-nutrient items. Studies such as Morland (2006) show that consumption of healthy food increases in low-income, minority communities when supermarkets become accessible, thus demonstrating that demand may not be adequately met by local supply in these areas. As Glenn Ford, a food retail entrepreneur from Minneapolis, argues, the issue is not so much one of hunger, but a lack of nutritional quality (Ford 2012). Low-income families are spending money on food every day, but the costs of acquiring healthy food become too high in areas of limited access. In this way, consumer benefits are not being maximized and producers may be missing out on potentially profitable business; thus the total net benefits to society are diminished. Ultimately, it may well be that disparities in healthy food access have suppressed meaningful competition in inner city communities, resulting in a distribution of resources that is not only unequal, but also inefficient for the economy as a whole.

VI. Food Access as a Matter of Justice

Beyond the basic implications for public health and economic development, why is food access an issue of environmental justice? Moreover, why should this be of immediate concern to local policy makers? Broadly speaking, the study of environmental justice seeks to examine the unequal distribution of environmental risks and benefits across geographic and socio-demographic lines. The environmental justice movement argues on behalf of those communities—often low-income, minority populations—where people are disproportionately affected by polluted land, water, and air. Increasingly, however, advocates have sought to extend this concern for distributive justice to the complex issue of food systems. Such a "food justice" agenda "ensures that the benefits and risks of where, what, and how food is grown and produced,

transported and distributed, and accessed and eaten are shared fairly" (Gottlieb 2010). The food desert issue raises critical questions of justice about the ways in which the benefits and risks of the current food system are distributed among different segments of society.

Theories of distributive justice address the broad spectrum of social values on personal liberty and the proper role of government in regulating society. Social contract theory, for example, is a widely accepted approach in American society that articulates and justifies the need for government on the grounds that government protects rights and ensures justice. However, which rights must be protected and the extent to which government should go to ensure them has long been a contentious issue of debate. Democratic governments are bound by a duty of justice; thus it is important to articulate what exactly constitutes a just distribution in order to effectively present a case for why certain processes or outcomes should be rectified.

In *Anarchy, State and Utopia* (1974), Robert Nozick argues for the importance of protecting individual property rights, but that only minimal state intervention to protect these rights is justified and that "any state more extensive violates people's rights." Nozick argues that any distribution that results from voluntary transactions is just. If the individual has rightfully created or attained resources and engages in the voluntary exchange of these resources in the free market, then the outcome is justified. This "entitlement" theory of justice considers the historical implications of how distributions came about, rather than using end-result principles to determine how resources are distributed and "who ends up with what." Thus, as long as government serves its minimal purpose of protecting personal rights and nothing more, Nozick believes that liberty and autonomy can thrive, and justice will be achieved.

We believe that Nozick's entitlement theory of justice is misguided in two particular ways. First, his theory holds a central focus on how resources are distributed among individuals

without acknowledging how injustices can arise from structural forces that create and perpetuate racial and socioeconomic inequalities. Nozick does not address the possibility of markets ever allocating opportunities and benefits inefficiently; market failures are hardly a consideration in Nozick's idyllic view of capitalism. From his standpoint, if we allow voluntary processes of exchange to run their course without government regulation, we will end up with a just distribution – no matter how unequal it may be. The problem is that Nozick's conception is predicated on the assumption of a just starting position where all are able to engage in the acquisition and exchange of resources. However, as we know from the history of segregation and discrimination in this country, the playing field has in no way been level for all.

Our second, and perhaps greater, concern is that Nozick does not adequately address how these past injustices should be rectified so that the free market can function efficiently and fairly. As previously described, historical discrimination has fundamentally shaped the socioeconomic landscape of modern American society; thus this shortcoming in Nozick's argument appears particularly troubling. How can we expect a just distribution for racial minorities and other marginalized groups when they live in neighborhoods so deeply influenced by discriminatory policies? There must be a way to repair past wrongs in order to create a more just future, yet Nozick does not provide a way for this to be achieved. In the context of food deserts, where the distribution of healthy food privileges has been shaped by discriminatory policies in the housing and retail industries, it is not fair to assume that free market capitalism will provide a just outcome. By contrast, other social contract theorists promote a more compelling description of how risks and benefits are distributed, thus emphasizing the government's role in ensuring collective wellbeing and a society free from oppressive inequalities.

For example, in *A Theory of Justice* (1971), John Rawls aims to articulate a shared consensus on the basic principles of distributive justice by considering what would happen if we constructed a theory of justice behind a "veil of ignorance" that prohibited us from knowing our place in the hierarchy, and then chose the social values we would want to live by. Rawls' methodology ensures that our choices would not be distorted by personal bias and selfishness. What he concludes is that people would sacrifice the opportunity to be as wealthy and advantaged as possible for the assurance that they would never be extremely destitute and impoverished. Everyone would want some sort of safety net insuring a basic standard of equality and freedom from oppression. To achieve this, Rawls proposes that society should be organized according to the following principle of justice: "all social primary goods—liberty and opportunity, income and wealth, and bases of self-respect—are to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favored."

In contrast to Nozick, Rawls presents a vision of society that tends toward equality in working to repair historical injustices so that everyone—particularly the most vulnerable—can benefit in some way from the larger social system. In essence, Nozick conceives of society as a collection of independent actors interacting and exchanging resources with one another for the sole purpose of personal gain. Rawls, on the other hand, understands that members of society are inherently interdependent, and thus recognizes that active cooperation is necessary for collective wellbeing. To ensure this better state, Rawls' theory justifies more extensive government intervention in order to maintain equality or at the very least an adequate safety to ensure basic liberties and opportunities for all.

In the context of the current food system, we see that access to a fundamental good—healthy food—is drastically unequal in its distribution and availability among different segments

of society. However, the unequal distribution of this resource does not work to the advantage of the least favored – especially low-income, minority communities. The reality, as we have argued, is quite the opposite. The disproportionate lack of access to affordable healthy foods has created dire circumstances for the public health and economic development of inner city communities. Thus, from a Rawlsian perspective, the current system for distributing healthy food is unjust. Some may argue that free market transfers in the food retail industry have created wealth, and thus social services, that potentially benefits marginalized neighborhoods. Although it would be very difficult to track what actually "trickles down" from the profit of suburban supermarkets to inner city residents, it seems likely that the increased costs of healthcare and access to groceries in food deserts would far outweigh these benefits. Therefore, we reject the notion that the current food system works to the benefit of the poor in some way. We believe that the presence of food deserts is unjust and must be addressed now.

Ultimately, "should the very existence of geographical areas devoid of healthy food retail be viewed as an anomaly that can be easily fixed, or as a symptom of systemic injustice that requires policy-level rethinking?" (Desjardins 2010). We believe that the presence of food deserts represents an environmental injustice. Policy makers have a duty to ensure a just society; therefore we argue that this issue requires public policy intervention, creating change for vulnerable citizens. To this end, we have chosen to examine two distinct policy strategies that could provide a more just and effective food system for those currently suffering the most.

Food Deserts in New Orleans: Problems and Solutions

VII. The Lower Ninth Ward as a Case Study

Selecting a case study for a policy analysis is different than selecting a case for theory building. Good policy cases place an emphasis on relieving suffering and improving human

welfare. New Orleans, and the LNW in particular, serves as a good case study because of the severity of the food desert problem that results from the city's unique geographic setting, its long history of racial discrimination, and the LNW's high profile status in the aftermath of Hurricane Katrina. The LNW is characterized by all the factors typically found in food desert areas: a large population of racial minorities, high poverty rates, poor health trends, and severely limited access to fresh foods. We believe that although the LNW requires its own sets of unique solutions, our findings can be generalized in order to solve food deserts elsewhere. Therefore, the LNW presents itself as a compelling case for policy makers to address.

In many ways, New Orleans' unique geography has long shaped its social settlement patterns: until the 20th century, development was largely confined to the higher land atop the city's natural levees along the Mississippi River (see Appendix II for a map of New Orleans). Much of New Orleans is classified as a topographical "dip pattern" – a below-sea-level depression that lies between two mounds of higher ground (Landphair 2007). Historically, higher land has offered the most protection from flood damage, and thus much of it was developed by the wealthy. Meanwhile, the "swampy expanse downriver that ultimately became the Ninth Ward attracted mostly free people of color and immigrant whites… unable to afford property on higher ground" (Landphair 2007).

New Orleans' notorious reputation for natural disasters has also heavily influenced race and class trends throughout the city's history. Hurricane Betsy, for example, struck the city in September 1965, flooding certain areas with over six feet of water (Landphair 2007). Many of the residents in poorer areas, such as the LNW, were left for days before any attempts at rescue were made. In "'The Forgotten People of New Orleans': Community, Vulnerability, and the Lower Ninth Ward," Landphair (2007) explains that Hurricane Betsy "exacerbated white flight

from the Ninth Ward" and was the "catalyst that drove remaining whites, already inflamed by school integration, to St. Bernard Parish." Furthermore, the storm "came to symbolize long-standing municipal indifference to the Ninth Ward" (Landphair 2007).

Today, the racial and economic make-up of New Orleans and the stark variation across neighborhoods have attracted the attention of environmental justice research (Bullard 2009; Massey 1993; Mielke et al. 2001; Perlin 2001; GNOCDC 2011). New Orleans has exceptionally high poverty rates, with 24 percent of the population living below the poverty line from 2005-2009, compared to 15.1 percent nationally in 2010 (DeNavas 2011). In certain neighborhoods, that number is as high as 70 percent (Rose and Bodor 2009). Its racial makeup is also extreme – the citywide African American population is nearly 70 percent, with some neighborhoods reaching 99 percent (US Census Bureau 2010).

The inequality that is widely present in New Orleans extends to food access and health as well. Scholars and policymakers have cited New Orleans as being one of the worst food deserts in the nation (Gottlieb 2010). Across the board, the city's inhabitants have minimal access to supermarkets and, consequentially, minimal access to fresh food. Each supermarket in the city serves 18,000 people on average – almost double the national average of 10,000 people. Over 60 percent of New Orleans neighborhoods are located more than 2 kilometers away from a supermarket, and an astounding 87 percent are at least 1 kilometer away (Rose and Bodor 2009).

Even in this broader context of limited food access, the LNW stands out as the most extreme example of healthy food deprivation in New Orleans. With a poverty rate of 26 percent, an African American population of over 80 percent, and limited access to fruits and vegetables defined as nutritious staples by the USDA Thrifty Food Plan, the LNW exemplifies the vulnerability of residents living in food deserts. Furthermore, 40 percent of residents in the area

do not own cars, making the trip to a far-away supermarket a major obstacle in accessing healthy foods in the LNW (Rose and Bodor 2009).

While healthy food access has long been a problem in the LNW, the devastation wrought by Hurricane Katrina has exacerbated the situation in many ways. The LNW was the neighborhood hardest hit by the storm, given its low-lying land in close proximity to the Industrial Canal that experienced two major breaches. The severity of the devastation has prevented many residents from moving back into the community: prior to Katrina, the LNW had a population of 14,008; as of 2010, only 2,842 people had moved back into the community as permanent residents (US Census 2000, 2010). Many homes that were once occupied by families now stand empty, with large "Xs" spray-painted on them – markings made by FEMA that indicated whether or not a home had been searched after the storm.

Although the community has been through incredible trauma and hardship, it should not be considered a lost cause. Extreme cases of food deserts exist throughout the US, but the case in New Orleans presents a unique opportunity for positive change. Hurricane Katrina may have wreaked havoc on the city's infrastructure in 2005, but it also created incredible potential for much needed structural readjustment and rebuilding. As scholar and city planner Chester Hartman (2006) writes, "Katrina exposed the consequences of decades of institutionalized discrimination and inequality, resulting in extreme human suffering, devastation and economic losses for individuals and families on the lower rungs of the socioeconomic ladder." Seven years after Katrina, widespread disparities still exist in New Orleans, but the opportunity to improve struggling communities such as the LNW through policy change is still very much possible. For these reasons, we have selected the LNW not only as a food desert facing significant challenges, but also as a place with tremendous potential for implementing policies to improve community

wellbeing and livelihood through greater fresh food access. As Flint Mitchell (2012) of the Greater New Orleans Foundation explains, “Hurricane Katrina presented us with a unique opportunity to make a change to the community environment in New Orleans… we have a great opportunity to make changes for the better. One of our goals is to become one of the best cities in the US in terms of food access.”

VIII. The Potential Solutions

Varying schools of thought exist on how to increase access to healthy foods and alleviate the problem of food deserts in low-income urban communities. Our policy analysis compares two distinct strategies in this regard. One approach provides incentives for corporate supermarkets to open stores in areas of limited food access. Another approach demands a ground-up, grassroots effort to build and sustain a locally viable food system.

In New Orleans, policy makers and community leaders have begun to address food access disparities. The New Orleans Food Policy Advisory Committee was established in 2008 as a broad coalition to advise the city council on improving community food access (FPAC 2010). That being said, additional efforts are needed to provide a feasible, long-term solution for the community. We will evaluate the potential impact of two different solutions in the LNW: bringing a mainstream supermarket to the community versus establishing a local food system.

Bringing in a large outside grocer is a policy option that takes advantage of the "conventional system’s ability to supply low-cost food" to residents in the LNW (Desjardins 2010). Supermarkets are defined as large retail stores operated on a self-service basis, selling groceries, fresh produce, meat, bakery and dairy products (Encyclopedia Britannica 2012). Supermarkets provide customers with a wide variety of fresh, nutritious food at competitive prices year-round (New Orleans Food Policy Advisory Committee 2006). Additionally, Aimee

Quirk, the economic advisor to the mayor of New Orleans, believes that the placement of a supermarket "economically stimulates and revitalizes the community" (Quirk 2012).

Alternatively, a local food system stresses a direct connection between producers and consumers that "circumvents the conventional food supply chain and its reliance on car-culture, experimenting with smaller-scale, more community-based provisioning of food" (Desjardins 2010). A local food system in the LNW would include a farmers' market, a CSA drop-off site, and community gardens. Farmers' markets are often held in a public space where local farmers sell produce and a variety of other products directly to consumers. CSAs are a system in which consumers buy a share of a farm's harvest at the beginning of the season, receiving a portion of the produce on a weekly basis, while also insuring financial stability for the farmers. Establishing a CSA drop-off site in the LNW where members could pick up their weekly produce share would provide residents with another form of direct access to fresh, local produce. Another dimension of the local food system involves community gardens, which provide residents with a plot of land on which they independently grow food for a nominal fee. In the LNW, where vacant land is plentiful, the establishment of community gardens is a tremendous untapped resource in improving food access (Kharod 2012). Policy makers often stress the importance of community involvement in improving healthy food access in the LNW, which comprises a key attribute of a local food system (Davis 2012; Green 2012; Kharod 2012).

In reality, the policy options to the food desert crisis in the LNW need not be so polarized; a supermarket and a local food system could theoretically coexist and prove beneficial to the community. However, we believe that comparing these contrasting solutions is an important exercise in understanding what is best for the community. For our purposes, we aim to highlight the process involved with choosing between these two different policy approaches.

IX. Evaluating Policy Options

In thinking like policy makers in New Orleans, we want to understand the problem of food deserts in the LNW neighborhood and decide on a course of action that will best improve access for marginalized residents. A food desert, as we have defined, is a low-income area that not only has a low availability of healthy foods relative to other neighborhoods, but also has such limited access as to hinder residents' ability to consume a nutritiously sufficient diet. Knowing that the lack of affordable healthy food options is extreme in the LNW and that the implications for personal health and economic development are severe, our aim is to figure out which option would provide the greatest benefit to the community in the most feasible, cost-effective manner.

We will evaluate which alternative would most successfully achieve four distinct objectives: (1) improve public health, (2) improve economic development, (3) improve social capital, and (4) improve environmental quality. As Susan Hoyt, former City Administrator from Northfield, Minnesota explains, a policy maker would likely choose an alternative based on two fundamental considerations: "(First) will [a policy solution] meet the community's health or quality of life goals and needs? And (second), how feasible is it to implement in the local community? In other words, what are the barriers?" (Hoyt 2012). Furthermore, it is important to consider the factors that would shape local policy making decisions in New Orleans. As Liz Shephard of LifeCity in New Orleans explains, policy makers in the city make decisions based on how compelling a case may be and if there is available funding to support a given project (Shephard 2012). Thus, selecting the relevant criteria and weighing the importance of each objective is an essential part of evaluating the need for local policy intervention. Ultimately, we hope to use our selected criteria to present a coherent case for why one of these two policy options is the better choice for addressing the needs of the LNW community.

X. Improving Public Health

Any solution to the LNW food desert problem must aim to alleviate the pressing public health concerns in the area. Our goal is to help improve the overall health of the residents in the LNW community. We aim to evaluate the effectiveness of two different policy options in making it easier for residents to meet healthy dietary standards in order to lower rates of obesity, diabetes, and cardiovascular disease, while decreasing the prevalence of malnutrition in the neighborhood. An ideal policy solution will allow all LNW residents to meet these public health standards through increased access to fresh food.

Across the board, studies show that increased access to fresh fruits and vegetables leads to increased consumption of these goods. One study found that participants with a supermarket within one mile of their home were 25-46 percent more likely to have a healthy diet as defined by the Alternative Healthy Eating Index, a dietary index associated with lower risk of chronic disease (Moore 2007). A study from New Orleans found that for each additional meter of shelf space given to fruits and vegetables, an individual's fresh produce intake increased by .35 servings (Bodor 2007). Another found that decreased travel distance to a food retailer led to higher fruit and vegetable consumption, and that overall, increased access to supermarkets led to higher consumption of fresh produce (Rose and Richards 2004). Specifically, African Americans have been found to increase their fruit and vegetable consumption by 32 percent for each additional supermarket located in a given census tract (Morland 2002). Such data strongly suggest a correlation between improved access and increased consumption of healthy food.

Although a variety of evidence suggests that consumption of fruits and vegetables increases with improved access, it is important to consider the different degrees of access provided by a supermarket versus a local food system. Supermarket produce departments have

"made way for year-round varieties, pre-cut produce, and more packaged and branded items" (Kaufman et al. 2000). They have the ability to sell a wide variety of fresh produce year-round, despite the climatic restrictions of the region in which each is located. For instance, the average supermarket in the US stocks 355 produce items, a number that has doubled over the past decade (Kaufman et al. 2000). Proximity to supermarkets has been shown to decrease rates of obesity, diabetes, and diet-related disease, as well as lowering average body mass index (Treuhaft and Karpyn 2010). Furthermore, the implementation of a supermarket in a food desert may lead to decreased malnutrition among residents, which Turner suggests is a large contributor to poor public health in the LNW (Turner 2012).

Local food models such as CSAs, farmers' markets, and community gardens, on the other hand, are subject to volatility when it comes to year round produce availability. In Louisiana, spring planting dates for many local varieties range from early January to mid-April, and fall planting dates range from late July to early October (Koske et al. 2009). The Louisiana Grower's Guide suggests optimal planting and harvesting times for different varieties, providing months in which a variety of produce should be more abundant. Between late July and early August, farmers in Louisiana can grow cabbage, southern peas, broccoli, cantaloupe, and several other fruits and vegetables. However, between April and May, only eggplant—which must be transplanted from another area—and cucumbers, can grow successfully (Koske et al. 2009).

A local food system would also bring other health factors into consideration. One study examining the impact of farmers' markets in Los Angeles revealed that 99 percent of shoppers believed that their neighborhood farmers' market "improves the health of the community" (McCarthy 2007). Additionally, community gardens could provide exercise opportunities for those actively involved. Studies show that gardening as a form of exercise is correlated with

reduced risk of obesity, coronary heart disease, and diabetes (Bellows et al. 2004).

It is therefore evident that our two policy options will provide varying levels of access to fresh produce throughout the year, impacting the health of LNW residents differently. While both options would improve the supply of fresh produce to the LNW community, we believe that a supermarket model would address diet-related public health concerns more effectively. A supermarket enables "one-stop shopping," which allows customers to buy all their food items in one location (PolicyLink 2007). Furthermore, supermarkets typically sell produce at a lower price than alternative food retailers because supermarkets are able to take advantage of economies of scale (Sheffrin 2003). Finally, supermarkets are likely to have longer, more consistent hours of operation than components of a local food system could offer. These factors would help increase residents' access to healthy, affordable produce, which in turn could help them maintain a healthier diet. Given that New Orleans aims to become one of the fittest cities in the country in the coming years, it is crucial to provide LNW residents easy, reliable access to affordable fresh food (Mitchell 2012). From a public health standpoint, we believe that a supermarket model would be the best solution to alleviate diet-related health problems in the LNW quickly, affordably, and efficiently.

XI. Improving Economic Development

A critical component of addressing food access inequalities in the LNW is the type of economic development that would occur with the introduction of a supermarket or a local food system. As previously discussed, the presence of food deserts can create problems for the equity and efficiency of a local economy. In the LNW, where the poverty rate is close to 30 percent and the average income is around $24,000, there is clearly a need for new, robust forms of economic development (Rose and Bodor 2009). In deciding which policy option would provide the greatest

benefit to the LNW, it is important to emphasize that we want the community to develop in the most equitable and efficient manner possible. As such, we want to see an increased supply of healthy foods in order to create greater market competition and a reduction in the procurement costs for low-income households. Furthermore, we want to choose an option that stimulates economic activity, providing jobs, revenue, and infrastructural investments for the community.

Attracting a large, full-service supermarket can provide a number of benefits for the economic development of inner city neighborhoods. Studies show that supermarkets offer significantly lower prices for fresh produce and other healthy items than do smaller grocers or corner stores (Chung and Myers 1999; Kaufman 1997). By increasing the availability of healthy food sold at affordable prices, supermarkets can create more equitable economic conditions in food desert areas. Another important contribution that a new supermarket can provide is the addition of jobs for local residents. The addition of a new supermarket, on average, creates around 100 to 200 permanent positions, as well as many temporary construction jobs (Abel 1998). Another key benefit of attracting a supermarket to an inner city neighborhood is that it often catalyzes complementary forms of local business development, such as pharmacies and restaurants (Treuhaft and Karpyn 2010). Moreover, "when community-serving institutions like community development corporations (CDCs) hold ownership interests in the stores, they reinvest profits into the community through their other activities such as local affordable housing construction or small business development" (Treuhaft and Karpyn 2010). Along with these potential developments, it is important to consider that large supermarkets can bring much needed revenue to neighborhoods in the form of sales and property taxes, which can be used to further finance local services and infrastructural improvements.

Alternatively, the strategy of developing a local food system has the potential to provide a number of economic benefits as well. The introduction of a farmers' market, for instance, can serve as a small business incubator for residents to sell homemade products. The initial fixed costs of operation at a farmers' market are minimal, thus providing an accessible pathway for low-income residents to generate personal revenue (Treuhaft and Karpyn 2010). Furthermore, research has shown that farmers' market offer prices for fresh produce that are often lower than those of nearby grocery stores because farmers are able to reduce supply costs by selling directly to consumers. One study from southern California shows that farmers' markets offered average savings of 28 percent over nearby grocery stores (Treuhaft and Karpyn 2010). Another component of the local food system model involves improving connections between farmers and consumers through the establishment of both CSAs and community gardens. Encouraging urban agriculture greatly reduces costs for low-income communities by providing fresh produce at a significantly lower price. Studies estimate that an urban farm can provide approximately $500-1,200 worth of fruits and vegetables per household per year. Furthermore, research shows that for every one dollar invested in a community garden, residents receive returns of around six dollars worth of fresh produce (Treuhaft and Karpyn 2010).

Ultimately, one of the most important aspects of a local food system—and one of its key distinguishing features from a supermarket model—is that produce that is sourced, managed, and sold locally will keep residents' food dollars circulating within the community. Such a self-sustaining cycle can help to stabilize and strengthen neighborhood development in the long run. As Glenn Ford argues, when inner city residents are forced to go outside of their neighborhood to buy food, or even if they shop at a corporate supermarket in their area, there arises a "balance of trade" problem. In a sense, dollars are being exported out of a community without importing

or generating capital revenue that will be invested back in the local economy. In a supermarket-oriented system, money either leaves an area outright, or is spent at a nearby chain store, such as Wal-Mart, that absorbs the majority of benefits without recycling profits locally (Ford 2012). Perhaps the most common way to quantify this impact is to estimate "leakages" of capital out of a given community. At the state level, for example, studies estimate that if every household in Virginia spent $10 per week on locally produced food, it would translate to an additional one billion dollars in the economy (Treuhaft and Karpyn 2010). While it would be very difficult to calculate such losses at a neighborhood level, such as in the LNW, it is important to consider the ways in which any food system actually extracts from or bolsters a local economy. Therefore, we believe that by "plugging the leaks" and providing neighborhood residents with affordable healthy foods, a local food system model would provide the most equitable and efficient solution for the LNW community to develop moving forward.

XII. Improving Social Capital

Social capital refers to "interpersonal trust [within a community] – the norms of reciprocity and mutual aid that facilitate collective action for mutual benefit" (Kawachi 1999), an element that is vitally important to healthy communities. Measuring social capital takes into account an individual's level of trust, integration into a social network, membership in voluntary associations, and self-efficacy (Lillbacka 2006). In the US, higher levels of social capital have been linked to better health, quality schools, more economic growth and racial tolerance, and less juvenile delinquency, tax evasion, and violent crimes (Kawachi 1999; Putnam 2001). One study found that Louisiana ranks dead last in the US in overall social capital and ranks last or near last in each of the above categories (Putnam 2001). Furthermore, Kawachi (1999) found that Louisiana had the highest level of social distrust of any city in the country.

In the LNW, we aim to evaluate the impact that the opening of a supermarket and the creation of a local food system would have on social capital by assessing resident participation in a community organization, self-reported happiness, neighbor relations, and trust. Though these measurements are difficult to quantify, there is well-documented reason to believe that associations exist between food venues and community cohesion.

Supermarkets are a central location to see one's neighbors, receive updates on community events, and meet new residents. Putnam (2001) suggests that even little interactions at the supermarket, such as nodding to someone in line, are a very important, however invisible, part of social capital building. Additionally, for many low-income residents, the presence of a supermarket in their neighborhood is a sign of economic progress and community success, which leads to increased social capital (Altschuler et al. 2004).

A local food system causes individuals in a community to congregate and associate with one another as well (Hinrichs 2000). Farmers' markets and CSAs both reinforce the 'invisible' social capital that is created from simple interpersonal interactions common at a food hub (Putnam 2001). Both markets and CSAs stress a direct connection between consumers and producers, creating relationships in which both parties benefit and a sense of solidarity is built. Community gardens serve as places of sharing and personal interaction, and can lead to increased trust and community cohesion. After looking at successful community food projects in Montreal, for example, Lovell (2010) found that gardens are vital in cultivating individual empowerment through the growing of one's own food, contributing to community interaction and enhancing technical and cultural knowledge. Community gardens also lead to other types of community organizing and neighborhood greening projects that nurture community capacity and build social capital (CFSC North American Urban Agriculture Committee 2003; Twiss 2003).

Glenn Ford explains that mainstream supermarkets often times violate fundamental aspects of creating community because members of the neighborhood are not involved in the planning and implementation of a store: "In very few of these inner city areas do you ever have people saying 'I really feel like I'm part of my own destiny'" (Ford 2012). Economically viable local food options, such as CSAs, Ford argues, are great "because there are local relationships that you can establish, and I believe that anytime you do that, that is a good thing" (2012).

Evidence from New Orleans' community members provides strong reason to believe that local food initiatives would boost social capital and feelings of community cohesion in the LNW as well. Nat Turner, founder of Our School at Blair Grocery—an alternative education center and commercial urban farm based in the LNW—has conducted research with the program's youth participants over the past several years. In his most recent "Participant Impact Survey," Turner asked a variety of questions to program participants about how they perceive the success of the project. The results show that 52 percent of respondents feel a stronger connection to their local community; 35 percent feel a stronger connection to their culture; and 100 percent feel more confident in their ability to run a small business or micro-enterprise (Turner 2011). Such results indicate that local food initiatives increase community cohesion and individual empowerment.

Both policy options increase social capital by creating gathering places that encourage personal interactions among community members. That being said, we believe that a local food system provides a greater boost to social capital than does a supermarket due to the inherent nature of social cohesion that is fostered in a community-built food system (Hinrichs 2000).

XIII. Improving Environmental Quality

The impact of Hurricane Katrina and its close proximity to industrial sites has made the LNW a focal point of the environmental justice movement, and has raised concerns about

environmental quality in the community (Ross and Zepeda 2011). The neighborhood's relationship to the surrounding environment has changed drastically since Katrina. Half of LNW community members have stopped eating fish from the adjacent Bayou Bienvenue Wetland Triangle, which has historically been a dietary staple, because of perceived toxicity (Ross and Zepeda 2011). Studies show that the LNW has soil arsenic levels that exceed safe limits and some of the highest soil lead levels in New Orleans, reaching 20,000 parts per million (the safe limit in the US is 400 ppm) (Abel 2010, Shogren 2006, Rotkin-Ellman et al. 2010).

Interestingly, it may be that improving food access and environmental quality are intrinsically linked in the LNW. Community members have identified the environmental restoration of their neighborhood as a key to improving access to healthy food. A healthy natural environmental is "necessary for food justice in the Lower 9th Ward because wetland degradation has diminished access to culturally relevant food that was traditionally procured from surrounding wetlands and grown within the neighborhood" (Ross and Zepeda 2011). We aim to evaluate which of these policy options is more beneficial for the LNW community given residents' hope for environmental restoration in the wake of Katrina and the desire for renewed access to healthy, fresh, and traditional food in the area (Ross and Zepeda 2011).

Building a supermarket, which involves the use of a large paved area, would reduce neighborhood "green space," and may replace infrastructure that capitalizes on the natural environment, such as a community garden (Pauleit et al. 2005). Scholars have suggested many benefits of having green space, from increasing nearby property values to reducing human and environmental health risks (Forest Research 2010). Furthermore, scholars have found that rainwater runoff increases with "the replacement of vegetation by impervious built and paved surfaces," which leads to "less infiltration" (Pauleit et al. 2005). Adding a large tract of paved

surface for a supermarket decreases the amount of vegetation able to filtrate rainwater runoff.

A local food system could utilize the large amount of vacant land in the LNW by encouraging green space initiatives such as community gardens. Hurricane Katrina left large swaths of deserted open land. The LNW is 1.8 square miles and has 2,000 housing units today, compared to 5,600 in 2000 (GNOCDC 2010). Actively using these areas for gardens and farming may result in a significant increase in ecological awareness among residents. It is also possible that the process of developing community gardens could help remediate soil quality by either growing inedible plants to facilitate the uptake of contaminants or by removing polluted topsoil (Gottlieb and Joshi 2010; Rotkan-Ellman et al. 2010). Forest Research suggests that, "the removal of contamination, waste and derelict buildings through regeneration transforms local areas, increases inward investment and increases local house prices" (2010).

In addition to soil remediation, a local food system could have benefits for flooding in the LNW. In 2009, FEMA put the LNW in the 'highest flood risk' category when evaluating the potential for future flooding in New Orleans (Kirkham 2009). Given this, it is important to consider that green space in the LNW, such as community gardens, can significantly reduce runoff (Gill et al. 2007). In addition, a local food system could lead to significantly less packaging waste and fewer carbon emissions in the neighborhood compared to that produced by a supermarket (Lovell 2010).

Each policy option for increasing food access in the LNW could also have broader global environmental implications. Although these impacts are inherently more dispersed than on a local level, it is important to consider how each policy option fits into the context of the larger food system. Greater demands for produce could increase carbon emissions from production and transportation, water usage, pesticide use, and deforestation. Studies have attempted to quantify

the broader environmental impacts of the food system using food miles and land use change as indicators of a food basket's ecological footprint (Pretty et al. 2005; Pauleit et al. 2005). For instance, fruits and vegetables travel, on average, 1,500 miles across the country from field to supermarket. Moreover, it is estimated that the food industry accounts for 10 percent of fossil fuel use in the US – 80 percent of which comes from processing, transport, and domestic energy consumption (Treuhaft and Karpyn 2010). While such figures are important to understand the scale of the problem, further research is needed to determine how these impacts could be assessed on a neighborhood level.

We conclude that a local food system would be a more beneficial option for improving environmental quality in the LNW. Turning unused land into productive food growing spaces makes use of available resources and limits the transportation and packaging costs of produce by connecting the source and the consumer physically. Maintaining green space may also help mediate flood risk by improving natural runoff drainage. Furthermore, we believe that a local food system will promote community dialogue about ecological awareness to a greater extent than would a supermarket. Residents would have the opportunity to become more involved in their food system and community than if they were to purchase produce at a supermarket.

XIV. Feasibility Analysis

In order to address food access deficiencies in the LNW, it is important to evaluate how a supermarket or a local food system would achieve our four main policy objectives. However, it is also critical to evaluate the feasibility of implementing and sustaining either policy option in the community. "Not every community can support a grocery store nor can every store be the best option for healthy foods; every community needs to figure out what will work for them and

what they need" (Treuhaft and Karpyn 2010). Ultimately, the best policy solution will provide the greatest benefit to the LNW in the most cost-effective and socially desirable manner.

Supermarket Model

In many ways, a conventional supermarket would provide reliable access to a familiar type of food venue for local residents. Currently, many LNW residents travel outside their neighborhood to purchase groceries at a Wal-Mart shopping center (Turner 2012). Bringing a similar store into the LNW would provide residents with a familiar shopping experience. As Nat Turner points out, people are used to the "perfect vegetables and the homogenized milk" found in a supermarket (Turner 2012). Furthermore, supermarkets are typically open from 12 to 24 hours a day, providing people with a reliable source for fresh food.

One challenge to implementing a supermarket in the LNW would be the high start-up and maintenance costs. Initial fixed costs for a new site would include land acquisition, labor, and construction materials. The costs of developing a new supermarket can run in to the millions of dollars. For example, in St. Petersburg, Florida, the development of a 38,000 square-foot supermarket cost $9 million, an amount that is considered significantly lower than average (PolicyLink 2007). Given the large scale of a supermarket, operating costs tend to be quite high. Once a supermarket is open, operational costs can include insurance, rent, equipment maintenance, labor, transportation, packaging, marketing, and outreach (CFSC North American Urban Agriculture Committee 2003).

Another major obstacle to the success of a supermarket in the LNW is the extremely low population density of the neighborhood post-Katrina. According to Glenn Ford (2012), a bare minimum of 7,000 residents is needed within a mile-and-a-half radius of a supermarket in order to make it feasible; a community of 50,000 to 200,000 would be much more desirable (Ford

2012). As for the LNW, Ford says that "for 2,000 people, there is a very small chance that you could have a full service grocery store there… as a matter of fact, it is impossible to make the numbers work for 2,000 people" (2012). For these reasons, we believe that a full-service supermarket would not be feasible in the LNW without partnerships of surrounding communities that have higher population densities to supplement local demand.

However, Ford suggests that providing transportation to a supermarket elsewhere in the city could be a potential short-term option until the population of the LNW rebounds (Ford 2012). But even this suggestion faces obstacles in regards to the geographic location of the LNW. Nearby St. Bernard Parish is a community that would be large enough to support a major supermarket, with a population of 35,897, but accessing the neighborhood from the LNW is only possible by the North Claiborne Avenue Bridge (US Census 2010). This access point is a "lift bridge" that lies over the industrial canal and opens to make way for passing cargo ships. The bridge is susceptible to fluctuations in the height of the canal water, forcing it to close often during storms. After Hurricane Katrina, for example, the bridge was out of service for two months (Baughn 2010). These sorts of infrastructural impediments could make regular access to a supermarket here very difficult for LNW residents. Therefore, we believe that building a supermarket in nearby St. Bernard Parish would be problematic for LNW neighborhood residents because of potentially inconsistent access to the area.

Local Food System Model

In recent years, local food initiatives have been springing up all around the country: farmers' markets nationwide have grown from 1,755 in 1994 to 7,175 in 2011, while CSAs grew from 50 in 1990 to 1,900 in 2008 (USDA 2011; Brown and Miller 2008). Although local food models have been successful in many cities across the US, there is no guarantee that such a

model would work in the LNW. Several factors to consider when analyzing the feasibility of this option are start-up costs, land availability and accessibility, and cultural fit.

The first-year budget for a farmers' market has been estimated to be $34,000, but actual cost is subject to factors such as market size, customer base, and market season length (Treuhaft and Karpyn 2010). CSA start-up costs are also highly variable because they are dependent upon the number of members involved and share prices. Community gardens require the lowest start-up cost of any local food system component at approximately $1 per square foot annually for seeds, soil, soil testing, fencing, and initial cleanup (Treuhaft and Karpyn 2010). This price is also dependent upon whether or not labor is volunteer or paid.

In addition to start-up costs, it would take time for a local food system to become established in the neighborhood, an important factor when assessing the immediacy of the problem. A new farmers' market, for example, can often take 3 to 5 years to become successful. As Madeline Kastler of the Institute for Agricultural and Trade Policy explains, "you need to somehow have your vendors show up week after week. What we have had is a real tough chicken and egg problem: the vendors show up for two weeks and there are only 2 customers and [the vendors] are out of there, and then the customers realize it's there and they come out and there are no vendors." Kastler suggests that monetary incentives for vendors to come consistently to a market would help to establish a successful farmers' market in the LNW (Kastler 2012).

An important consideration when analyzing local food system feasibility is the availability of capital for implementation, such as funds to attract vendors. There are several organizations in New Orleans and the greater Louisiana area that provide funding for community improvement initiatives, such as the development of local food projects. For example, The Foundation for Louisiana has a grant program aimed specifically at supporting innovation and

equitable access to resources. In late 2011, the Greater New Orleans Foundation awarded over $1.3 million in grants to six regional nonprofit organizations, several of which worked on food access issues. There are also national funding organizations, such as the Annie E. Casey Foundation, which strive to fund long-term commitments to helping vulnerable children and families. With ongoing grant programs and support from organizations like these, it seems likely that funding to develop a local food system in a community such as the LNW would be possible.

Another important consideration for the feasibility of a local food system is land availability and accessibility. Farmers' markets require regular access to a public space and an area for parking. CSAs require land for farming as well as a center for distributing their produce to buyers, while community gardens require small plots of land for farming (Treuhaft and Karpyn 2010). Given the very low return rate of residents to New Orleans post-Katrina, there remain some 40,000 vacant lots in the city, large concentrations of which sit in the LNW (New Orleans Healthy Food Access & Behaviors Convening 2012). However, gaining access to land that is viable for growing food is not easy. Sanjay Kharod of the New Orleans Food and Farm Network explains, "our biggest challenge is resources; resources are good quality soil and the area to have a sustainable farm… we have limited resources" (2012). In addition to contaminated soil, policy makers feel that they lack the resources to link interested residents to the little viable land that does exist in the LNW (Graham 2012; Kharod 2012). Moreover, the process of acquiring blighted lots for use is also a challenge. As Nat Turner describes, "the challenge of doing the other kind of work—with CSAs and more local food—is that it would take a massive alignment of state and local governments. Like here in [the LNW], we have massive blight and empty lots, and it took me over 22 months to be able to purchase lots from the city of New

Orleans" (Turner 2012). While there exists an abundance of unused land in the LNW, it may not be readily accessible for use, creating an obstacle to developing a robust local food model.

In assessing the feasibility of a local food system, it is also important to consider how it would fit culturally within the LNW community. Flint Mitchell of the Greater New Orleans Foundation suggests that the culture of high-calorie southern cuisine may be an impediment to change, and that healthy, locally grown produce may not interest consumers in New Orleans: "One of the things working against us is our culture (of food)... and it's hard to change that" (Mitchell 2012). It may be the case, however, that this lack of interest in fresh local food represents a disconnection between the older and younger generations in the LNW. Turner explains that, "all the elderly people in the neighborhood want bell peppers, and collard greens and mustard greens, and melon – they all want homegrown. As much produce as I can grow, they want it. But your average 20 or 30-something-year-old… has no interest in it" (2012).

Finally, a concern for LNW residents may be the form that a local food model takes. As Turner puts it, "in my experience, I don't think that black people in New Orleans do CSAs at all; they're not going to give you a check for $350 up front and then you're magically going to bring them some food at some point" (Turner 2012). Residents may be more supportive of community gardens or farmers' markets where they have the power to decide what produce they grow or purchase. Results of Turner's "Participant Impact Survey" show that 57 percent of respondents reported feeling more connected to their food and more committed to working on food access issues after being involved with community gardening (Turner 2011). This evidence suggests that neighborhood residents want fresh, healthy, local food, and that this demand could be met in a culturally appropriate manner through the development of a local food system in the LNW.

Conclusions

XV. Summary

After carefully considering the advantages and disadvantages of both a supermarket and a local food system model, we believe that the development of a local food system would serve as the best policy solution for addressing the food desert problem in the LNW neighborhood. While we acknowledge that a variety of other options could adequately meet the food access needs of the LNW community, for the purposes of this project, we believe that a local food system would serve as the most effective and feasible strategy in the neighborhood.

We believe that a local food system model would achieve the four main policy objectives in the LNW that we have outlined in the following ways: (1) alleviating public health problems by increasing access to affordable, fresh produce; (2) stimulating the local economy by circulating food dollars within the community; (3) boosting social capital and community building by means of growing and selling food; and (4) protecting the local environmental quality by utilizing available blighted property and increasing productive neighborhood green space. Furthermore, we have determined through our research that a local food system would be the most feasible of our two options in terms of cost-effectiveness and cultural fit in the LNW. We have reason to believe that promoting a local food system is financially possible, that the necessary resources are available, and that there is a significant level of demonstrated interest in such an initiative. Therefore, we conclude that the development of a local food system would serve the LNW more effectively than would a supermarket as a viable, sustainable solution that can improve the community's overall access to affordable healthy foods.

XVI. Significance

Our challenge to scholars and policy makers in conducting this analysis was to broadly consider the issues that have characterized urban food deserts and the factors that would influence a strategic food policy for a neighborhood such as the LNW. Through this process, we have learned, above all, that food deserts are a very complex and difficult problem to analyze and address fully. The significance of the problem itself and the implications for selecting potential solutions are tremendous. Food access fundamentally impacts the physical, economic, social, and environmental health of inner city communities. Therefore, the widespread presence of food deserts in a "land of plenty" raises major concerns about the efficacy, justness, and sustainability of the current food system and its ability to serve more vulnerable members of society. As issues of food justice have increasingly made their way into mainstream discourse, it is essential to think critically about the potential solutions being offered to these pressing problems.

While a variety of assumptions and decisions shaped our decision that a local food system would best serve the LNW, we believe that this conclusion is relevant and significant to broader debates on how to build a more just and sustainable food economy in the 21st century. Such discussions often revolve around the notion of developing smaller, more robust community food networks that encourage ecologically sensitive agricultural practices and dynamic local economies. Our evaluation further legitimizes this argument by conveying the ways in which a local food system can be on par with or superior to the conventional supermarket strategy in terms of improving public health, economic development, social capital, and environmental quality in a community. Although this is not a one-size-fits-all solution for every food desert, we should keep these factors in mind when trying to address food access inequality anywhere.

XVII. Limitations and Future Research

In the end, we recognize the ambitious nature of performing a policy analysis of this scope in a mere ten weeks, and we acknowledge that our study has a variety of limitations as a result. We would have benefited greatly from a broader range of interviews with organizers, community members, and policy makers in New Orleans. Furthermore, without adequate neighborhood level data on New Orleans, we were unable to present many statistics specific to the LNW for crucial components of our paper, such as the economic analysis. Ideally, we would have addressed these issues by spending significant time in New Orleans collecting primary data in the LNW in order to strengthen the validity of our neighborhood-specific arguments.

In addition, it is important to acknowledge that our analysis focused on two policy options that represent opposite ends on the wide spectrum of potential solutions to the food desert problem. In reality, the choices facing policy makers are not so absolute. However, for our analytical purposes, we chose not to evaluate any intermediary policy options, such as improving healthy food access through existing neighborhood stores in the LNW. Such a "hybrid solution" that combines aspects of our two policy options may "make the most sense" for the LNW community (Shephard 2012). As Rose and Bodor (2009) explain: "Low density areas of New Orleans, as well as other cities, do support smaller functioning markets… Retrofitting such markets with extra refrigerators to carry fruits and vegetables could be a more efficient or lasting way to minimize access costs for areas residents."

Ultimately, we suggest that future research should evaluate the benefits and feasibility of policy options along the entire spectrum of possible solutions in order to gain greater insight into how to best address the food desert problem. We hope that researchers can use our work as a starting point for improving policy analysis on urban food access issues in the future.

Appendices

Appendix I: List of Interviewees

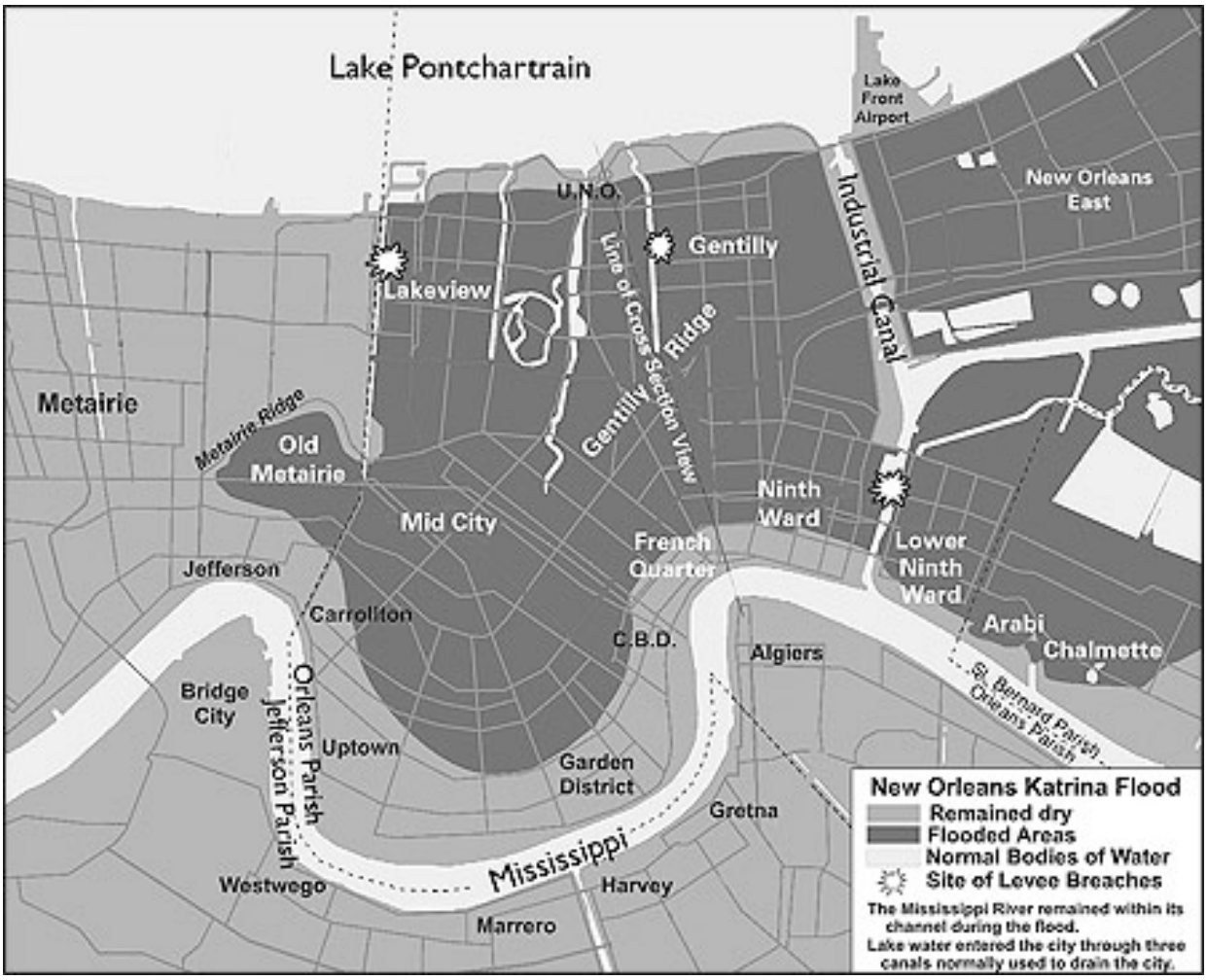
Glenn Ford – Founder and CEO at Praxis Marketplace, Minneapolis, MN. Praxis Marketplace is a fledgling supermarket chain that aims to provide increased food access to underserved communities at a reasonable price while creating jobs and acting as a community center.

Madeline Kastler – Program Associate at the Institute for Agricultural and Trade Policy, Minneapolis, MN. Kastler focuses her work on the IATP's Local Foods program that "advances small and medium-scale sustainable farming by expanding market opportunities, innovative partnerships and supportive policy change."

Liz Shepard – Founder and Chief Sustainability Officer at LifeCity, New Orleans, LA. LifeCity is "a membership-based organization that supports the development of green businesses and local events, while educating consumers about green products and services."

Nat Turner – Founder at Our School at Blair Grocery, New Orleans, LA. Our School at Blair Grocery is "an independent alternative school and sustainability education center based in the Lower Ninth Ward, New Orleans."

Appendix II: Map of New Orleans highlighting the Lower Ninth Ward and the sites of flooding and levee breaches throughout the city in the aftermath of Hurricane Katrina in 2005



http://www.nieman.harvard.edu/reports/article/100573/New-Orleans-Lower-Nine-Fades-Fades-Fades-Away.aspx

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