FOOD JUSTICE IN POST-INDUSTRIAL US CITIES: THE ROLE OF NONPROFIT ORGANIZATIONS

A Dissertation
Submitted to
the Temple University Graduate Board

In Partial Fulfillment
of the Requirements for the Degree
DOCTOR OF PHILOSOPHY

by
Md Mahbubur R. Meenar
January 2014

Examining Committee Members:
Michele M. Masucci, Advisory Chair, Department of Geography and Urban Studies
Deborah A. Howe, Department of Community and Regional Planning
Lynn A. Mandarano, Department of Community and Regional Planning
Henry L. Taylor, Jr., External Member, State University of New York at Buffalo
ABSTRACT

The primary purposes of this dissertation were to (i) assess and identify post-industrial urban neighborhoods with food-insecure and vulnerable populations, and (ii) explore and analyze the role of nonprofit organizations (NPOs) in addressing place-based food insecurity. The study used mixed-methods, including qualitative GIS, statistical tests, surveys, interviews, and field observations. A food justice theoretical framework was used to develop a Place-Based Food Insecurity and Vulnerability Index (PFIVI), which factored together 33 variables to measure six indicators. The study applied this index in the City of Philadelphia and then examined three types of interventions that NPOs embark on – providing hunger relief, providing healthy and affordable food through the alternative food movement, and offering food-based programs and events tied with community capacity building efforts. Statistical relationships between PFIVI scores and NPO-driven programs showed spatial mismatch issues between the programs and community needs in some neighborhoods. This research also highlighted other limitations of these programs and the challenges that NPOs face both on- and above-the-ground. While the NPOs are trying hard to promote food justice through their mission statements, advocacy, outreach, and on-the-ground programs, the city may have only partially achieved this goal. A lot more needs to be done by strengthening organizational networks, strengthening social networks with community residents, and offering healthy but affordable food in disadvantaged neighborhoods, and NPOs alone should not bear these responsibilities.
To

My Daughter

Ereshva
I would like to thank my dear wife Sharmin for her unconditional love, support, and encouragement throughout my doctoral program.

I acknowledge my committee members Dr. Michele Masucci, Dr. Deborah Howe, and Dr. Lynn Mandarano, for their advice, constructive feedback, and support. I thank Dr. Henry Taylor, Jr., the external member of my committee, for his valuable time and inspiration.

I also acknowledge four students of the Department of Community and Regional Planning who assisted me with data collection and processing, field visits, and copy-editing: Gregory App, Brian Olszak, Matthew Popek, and Christine Thomas.

It would not be possible for me to undertake this study without the support from Philadelphia’s nonprofit organizations that are dedicated to local food systems, food justice, and food insecurity issues. I thank those administrative staff, managers, grassroots activists, and community organizers. I also would like to thank the Delaware Valley Regional Planning Commission and the City of Philadelphia’s Department of Public Health.

Last, but not the least, I acknowledge my boss and my mentor, Dr. Jeffrey Featherstone, for his strong support for my academic and research career throughout the last 13 years.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>iii</td>
<td>ABSTRACT</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>DEDICATION</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>ACKNOWLEDGMENTS</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>LIST OF TABLES</td>
<td></td>
</tr>
<tr>
<td>xii</td>
<td>LIST OF FIGURES</td>
<td></td>
</tr>
</tbody>
</table>

## CHAPTER

1. INTRODUCTION ................................................................. 1
   - Purpose and Background .................................................. 4
   - Justification of Study .................................................... 8
   - Research Questions ....................................................... 12
   - Structure of the Dissertation ......................................... 13

2. THEORETICAL BACKGROUND .............................................. 16
   - Social Ecology Framework ............................................... 17
   - Food-Related Literature ............................................... 21
     - Global Food Security .................................................. 21
     - Community Food Security ............................................. 25
     - Food Justice ........................................................... 26
     - Food Geography ....................................................... 28
   - NPO-Related Literature .................................................. 30
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>STUDY CONTEXT AND METHODOLOGY</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Study Context</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Post-Industrial US Cities: Policies, Debates, and Food Insecurity</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Study Location</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>The Neighborhood Context</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Methodology Overview</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Mixed Methods Research</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Qualitative GIS</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Research Design</td>
<td>72</td>
</tr>
<tr>
<td>4.</td>
<td>PLACED-BASED FOOD INSECURITY AND VULNERABILITY INDEX</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Measuring Food Insecurity – Review of Methods</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Development of a PFIVI</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>Selection of Indicators and Variables</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>Building Model in GIS</td>
<td>106</td>
</tr>
</tbody>
</table>
Application of the Model in Philadelphia .......................................................... 109
Data and Application ......................................................................................... 109
Results and Discussions .................................................................................... 122
Conclusion ........................................................................................................... 129
Next Three Chapters ......................................................................................... 130

5. THE DYNAMICS OF PLACE-BASED CHARITY FOOD PROGRAMS.............. 132
Hunger Relief Services ....................................................................................... 134
The RELIEF Index ............................................................................................... 140
  Selection of Variables ......................................................................................... 140
  Data and Methodology ....................................................................................... 140
  Results ............................................................................................................... 144
  Statistical Tests – HUNGER and RELIEF ......................................................... 146
Challenges Faced by the NPOs .......................................................................... 149
Conclusion ........................................................................................................... 154
Next Chapter ....................................................................................................... 155

6. ALTERNATIVE FOOD PROGRAMS AND NPOS ....................................... 157
Alternative Food Movement/ Community Food Movement .............................. 158
The ALTFOOD Index ......................................................................................... 167
  Data and Methodology ....................................................................................... 167
  Results ............................................................................................................... 172
  Statistical Tests – ALTFOOD and LOWACCESS ........................................... 174
Issues and Challenges ......................................................................................... 177
Conclusion .............................................................................................................184

Next Chapter .........................................................................................................185

7. NPOS AND THEIR COMMUNITY CAPACITY BUILDING .................................186

Selection of Study Samples .................................................................................187

Examination of NPO Activities ..........................................................................191

Data and Methodology .........................................................................................191

Results ..................................................................................................................195

Observations on the Ground .................................................................................229

Conclusion ............................................................................................................231

Next Chapter .........................................................................................................235

8. ASSESSING THE ROLE OF NPOS.................................................................236

Summary of Key Findings .....................................................................................236

Contribution to Theory and Methods .................................................................244

Contribution to Practice and Policy .................................................................250

Study Limitations and Future Research Agenda ...............................................259

Final Remarks: NPOs Addressing Food Justice? .............................................262

Conclusion ............................................................................................................267

REFERENCES CITED ..........................................................................................269

APPENDIX

A. SURVEY QUESTIONNAIRE ............................................................................305
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Social Ecology Framework</td>
<td>21</td>
</tr>
<tr>
<td>2. Levels of Community Development Organizations</td>
<td>36</td>
</tr>
<tr>
<td>3. Philadelphia Planning Districts and Neighborhoods</td>
<td>64</td>
</tr>
<tr>
<td>4. Overview of Study Methodology</td>
<td>74</td>
</tr>
<tr>
<td>5. Methods Used in Community Food Insecurity Literature</td>
<td>86</td>
</tr>
<tr>
<td>6. Place-Based Food Insecurity &amp; Vulnerability Index (PFIVI)</td>
<td>90</td>
</tr>
<tr>
<td>7. Details on Data Layers</td>
<td>111</td>
</tr>
<tr>
<td>8. Food Distribution among Philabundance Catchment Zones, 2006</td>
<td>137</td>
</tr>
<tr>
<td>9. Details on Data Layers – RELIEF</td>
<td>141</td>
</tr>
<tr>
<td>10. Chi-Square and Gamma Tests – HUNGER and RELIEF</td>
<td>148</td>
</tr>
<tr>
<td>11. Computing Spearman's rho – HUNGER and RELIEF</td>
<td>149</td>
</tr>
<tr>
<td>12. Details on Data Layers – ALTFOOD</td>
<td>169</td>
</tr>
<tr>
<td>13. Chi-Square and Gamma Tests – LOWACCESS and ALTFOOD</td>
<td>176</td>
</tr>
<tr>
<td>14. Computing Spearman's rho – LOWACCESS and ALTFOOD</td>
<td>177</td>
</tr>
<tr>
<td>15. Distribution of NPOs in Philadelphia’s 18 Planning Districts</td>
<td>190</td>
</tr>
<tr>
<td>16. Educational and Training Programs in a Year</td>
<td>198</td>
</tr>
<tr>
<td>17. Internships and Voluntary Work Programs in a Year</td>
<td>198</td>
</tr>
<tr>
<td>18. Events in One Year</td>
<td>199</td>
</tr>
<tr>
<td>19. Land Ownership</td>
<td>201</td>
</tr>
<tr>
<td>20. Methods of Communication with Constituents</td>
<td>205</td>
</tr>
<tr>
<td>21. Types of Content NPOs Shared through Social Media</td>
<td>206</td>
</tr>
</tbody>
</table>
22. Types of Content People Shared through NPO Social Media Platforms ........ 206
23. Types of Inter-O rganizational Partnerships ........................................ 208
24. Types of Inter-O rganizational Partnerships ........................................ 218
25. NPOs and their Bridging and Bonding Partners .................................... 221
26. Network Distance – Share Food Program and Its Partners ......................... 223
27. Network Distance – Mill Creek Farm and Its Partners .............................. 225
28. Network Distance – Southeast Philadelphia Collaborative and Its Partners .... 226
29. Network Distance – PHS and Its Partners ............................................ 227
**LIST OF FIGURES**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A conceptual flow diagram of the model</td>
<td>108</td>
</tr>
<tr>
<td>2.</td>
<td>HUNGER sub-model results</td>
<td>125</td>
</tr>
<tr>
<td>3.</td>
<td>LOWACCESS sub-model results</td>
<td>125</td>
</tr>
<tr>
<td>4.</td>
<td>HABIT sub-model results</td>
<td>126</td>
</tr>
<tr>
<td>5.</td>
<td>HEALTH sub-model results</td>
<td>126</td>
</tr>
<tr>
<td>6.</td>
<td>ENGAGE sub-model results</td>
<td>127</td>
</tr>
<tr>
<td>7.</td>
<td>RISK sub-model results</td>
<td>127</td>
</tr>
<tr>
<td>8.</td>
<td>PFIVI model result</td>
<td>128</td>
</tr>
<tr>
<td>9.</td>
<td>PFIVI rankings of Philadelphia planning districts</td>
<td>128</td>
</tr>
<tr>
<td>10.</td>
<td>Philabundance catchment zones in Philadelphia</td>
<td>138</td>
</tr>
<tr>
<td>11.</td>
<td>RELIEF scores in census tracts</td>
<td>145</td>
</tr>
<tr>
<td>12.</td>
<td>RELIEF scores of Philadelphia planning districts</td>
<td>146</td>
</tr>
<tr>
<td>13.</td>
<td>ALTFOOD scores in census tracts</td>
<td>173</td>
</tr>
<tr>
<td>14.</td>
<td>ALTFOOD scores of Philadelphia planning districts</td>
<td>174</td>
</tr>
<tr>
<td>15.</td>
<td>Locations of NPOs are shown as points</td>
<td>189</td>
</tr>
<tr>
<td>16.</td>
<td>NPO service areas</td>
<td>197</td>
</tr>
<tr>
<td>17.</td>
<td>Programs targeted toward vulnerable/disadvantaged populations</td>
<td>202</td>
</tr>
<tr>
<td>18.</td>
<td>Frequency of community engagement according to NPOs</td>
<td>204</td>
</tr>
<tr>
<td>19.</td>
<td>Conceptual network</td>
<td>213</td>
</tr>
<tr>
<td>20.</td>
<td>Organizational network of food-related NPOs and their partners</td>
<td>216</td>
</tr>
<tr>
<td>21.</td>
<td>Organizational network of food-related NPOs</td>
<td>217</td>
</tr>
</tbody>
</table>
22. Planning districts and their PFIVI and network density ranks .......................... 219
23. SHARE Food Program (circle) and its partners (squares) .............................. 223
24. Mill Creek Farm (circle) and its partners (squares) ..................................... 224
25. Southeast Philadelphia Collaborative (circle) and its partners (squares) ........ 225
26. PHS (circle) and its partners (squares) ......................................................... 227
27. Understanding NPOs in urban social ecology context ................................. 245
28. Raster overlay analysis using qualitative GIS .............................................. 248
CHAPTER 1
INTRODUCTION

I would like to introduce the topic of this dissertation through five place-based mini-stories. These stories appeared in popular newspapers, magazines, and other news outlets. Although the stories are set in Philadelphia, the fifth largest city in the US, their essence and experience are similar to, if not exactly the same as many other inner cities in the nation, especially post-industrial cities.

Location 1: Norris Square, Philadelphia

In the mid-1980s, a group of local women, tired of drug dealers and blight, began transforming a derelict vacant lot into an urban oasis called Las Parcelas… What was once a heaven for drug dealers now boasts vegetable and flower garden plots, an outdoor kitchen serving traditional Puerto Rican food, a mural and a colorfully painted 1940s-style casita. Led by Iris Brown, that original group of women activists now call themselves Grupo Motivos, and they continue to create beautiful urban gardens in and around Norris Square that represent aspects of Puerto Rican culture and identity, provide communal gathering spaces, and create service and recreational opportunities for local youth… Colobo, across Palethorp Street, is an African-themed garden that recognizes and celebrates the African roots of Puerto Ricans. Iris and Grupo Motivos worked with local gardeners, teenagers and visiting Ghanaian gardeners to design the space, which features three painted mud houses and indigenous African plantings… Colobo explores the shared African-Caribbean heritage in a city where racial tension defines so much of the urban experience, and in a neighborhood where the Latino and African American communities have not always found common ground. (Mandell, 2013)

Location 2: Northern Liberties, Philadelphia

Northern Liberties, which has experienced significant gentrification over the past two decades, lacked a major grocery store until the opening of a [supermarket] … But access to healthy, locally-grown products remained an issue for low-income residents of the neighborhood until this year. The Food Trust established a weekly farmers' market … that is part of the
Philly Food Bucks initiative, which was launched in 2010 by the Philadelphia Department of Public Health and The Food Trust. Philly Food Bucks are coupons designed to increase the use of ACCESS cards and SNAP food stamp benefits to purchase fresh produce at 25 Philadelphia farmers' markets in low-income communities… Residents of low-income neighborhoods in Philadelphia are half as likely to have access to quality grocery stores as residents of high-income neighborhoods. Over 30% of Philadelphia residents receive food assistance benefits but usage of those benefits at farmers' markets has been relatively low. (Wessell & Abbasi, 2013)

Location 3: North Philadelphia

Farm to Families connects a diverse group of Philadelphia-based nonprofits to get fresh, affordable, local food to North Philadelphia families each week, year-round… Just a decade ago, a national study conducted by the Fresh Food Financing Initiative showed that Philadelphia had the second lowest number of supermarkets per capita of major cities in the United States. Lack of food access was particularly severe in low-income neighborhoods and was linked to high rates of diet-related diseases such as obesity and diabetes… In order to reduce the number of food deserts in Philadelphia, the Farm to Families initiative was created to provide sustainable food systems for families in North Philadelphia, where rates of childhood obesity are the highest in the city [70 percent]. The systems create access to affordable, readily available and reliable sources of healthy, culturally appropriate and locally produced groceries… Participation is simple; individuals and family can easily order and pay for a food share one week ahead of time… The weekly shares are available in $5, $10 and $15 packages. Each box contains fresh fruits and vegetables. (Bennett, 2011)

Location 4: Philadelphia Metro Area

Gleaning is the time-honored practice of combing through fields, harvesting that which the farmer has left behind. In a contemporary context, that can mean fruits or vegetables that are too big, small, or oddly-shaped to meet mainstream specifications. Because labor is among the biggest expenses on diversified farms, gleaning can also mean harvesting a crop that a grower has chosen not to harvest knowing that he or she may not be able to break even on that labor. Philabundance, the largest hunger relief organization in the Delaware Valley and a member of the Feeding America network of food banks, has a new program to make sure that crops in the field like these don’t go to waste. The Philabundance gleaning program replaces farm labor with volunteers, capitalizing on a
resurgence of interest in agriculture, and employing a pick-your-own model where volunteers harvest instead on behalf of those in need. Food security in a contemporary context doesn’t strictly mean lack of access to calories, but consistent access to a variety of nutritious, satisfying, and culturally appropriate foods. Unfortunately for hunger relief organizations like Philabundance, accessing donations of high-quality foods, specifically fruits and vegetables, is especially difficult. Gleaning programs allow small-scale farmers, who aren’t often in the position to make big donations, to contribute in this mutually-beneficial model. (Teel, 2013)

Location 5: Center City, Philadelphia

Never underestimate the power of the people - in this case, the city's community gardeners and farmers. They've successfully fought an attempt to place restrictions on their ability to grow fresh food in neighborhoods all over Philadelphia. [A] City Councilman … has backed down from his proposal that growers in certain areas (mixed-use commercial) be required to get permission from the Zoning Board of Adjustment to use the land some of them have been growing on for decades. The idea was met with disbelief, then anger, and by this week the opposition had become very organized. The lobbying - and email traffic - was intense. (Smith, 2013)

These are some of the stories about Philadelphia’s poverty, vacant lands, hunger, food insecurity, healthy food access, organized community engagement, and citizenship. These are five examples of the programs or initiatives that Philadelphia-based nonprofit organizations (NPOs) undertake to not only address food hardship, but also distribute healthy food to community residents who just want to eat local, eat well, and eat sustainably. However, many times such stories may not offer the full narrative, as they lack constructive criticism of NPO programs, and do not focus on the struggles and challenges faced by these NPOs to fulfill their missions. As an example, the following narrative adds a new dimension to the very first example – Las Parcelas – driving critical attention to a number of issues that Grupo Motivos might be facing on-the-ground.

Las Parcelas gardens on lots, which have a checkerboard of ownership – including 4 or 5 different city agencies and private, tax delinquent owners.
Like many gardens [in Philadelphia]… Las Parcelas see land tenure as key to preserving these [urban agriculture] projects that represent the community’s legacy. Without land tenure or land use protections, many gardens have been lost, due to development pressure, when cities have sold [urban agriculture] spaces or allowed them to go to sheriff’s sale. (Meenar, Featherstone, Cahn, & McCabe, 2012, p. 7)

Purpose and Background

This dissertation offers a place-based analysis of food insecurity, poor food habit, food-related health conditions, and other relevant problems as experienced by vulnerable populations in many US inner-city neighborhoods. It also offers an examination of NPO-initiated place-based interventions (i.e. programs, outreach, and events) in disadvantaged communities. While I perform research on the role of these NPOs in combating food insecurity and vulnerability, I also seek to understand NPOs’ role in securing food justice in poor, minority neighborhoods. These concepts are briefly presented in this section, but will be discussed in detail in Chapter 2.

Based on commonly-used definitions, community food security (CFS) means having continuous “access” to adequate food for an active, healthy life (Nord, Andrews, & Carlson, 2009) and to food that is affordable, nutritious, culturally appropriate, and personally acceptable (Anderson & Cook, 1999). CFS is not only a numerical aggregation of household food security, but is also related to broader socio-economic-institutional factors that affect the quantity and quality of food and its affordability within a community. Food justice, as a theory and a place-based grassroots movement, connects to literature on democracy, citizenship, community development, community resilience,
networked social movements, and social and environmental justice (Wekerle, 2004; Gottlieb & Joshi, 2010; Alkon & Agyeman, 2011).

Food insecurity and hunger exist in many lower-income urban neighborhoods. In 2012, 18.2% of households surveyed by the Food Research and Action Center (FRAC) answered “yes” to the question – “Have there been times in the past twelve months when you did not have enough money to buy food that you or your family needed?” (FRAC, 2012). According to the US Department of Agriculture (USDA), one out of every six Americans in 2012 was food insecure. This means about 16% of Americans, including 17 million children, lived in food insecure households (USDA, 2013). The rate is disproportionately higher with vulnerable populations – 35% of households with children headed by single women and 25% of Black households were food insecure. For these people, food insecurity meant living with trade-offs, such as choosing between buying food and paying the bills or receiving medical care, or choosing between high-calorie, cheap junk food and fresh, nutritious food. In 16 metro areas, at least one in five people in 2012 reported food hardship (FRAC, 2012). The reasons for continued high rates of food hardship are commonly attributed to unemployment, low minimum wage, and inadequate nutrition support programs.

According to USDA, about twenty-nine million Americans live in food deserts, located in either urban or rural areas. Food deserts are lower-income rural areas where people have to travel at least 10 miles to get to their nearest supermarket/grocery store or lower-income urban areas where people need to travel at least a mile. While a one-mile
ride to the supermarket by car does not sound unreasonable, getting there by bus with multiple transfers may take a few hours in many inner cities.

This USDA definition of food desert is debated, because according to this definition many disadvantaged inner-city neighborhoods are not food deserts as they have access to even medium-size grocery stores, even though the quality and quantity of fresh and healthy food are not guaranteed and are usually higher-priced. Besides, not all grocery stores or supermarkets offer fresh produce at a competitive price. Geographic access to a certain food outlet does not mean people have real “access” to healthy food, because they may not have economic or cultural access. Food access became a national issue ever since First Lady Michelle Obama started her “Let’s Move!” campaign, an obesity awareness advocacy program, and the Obama administration started the Healthy Food Financing Initiative, a program to eliminate food deserts by providing financial help and incentives to get more supermarkets established in disadvantaged neighborhoods (US Department of Health & Human Services, 2010). Since 2004, the financial organization The Reinvestment Fund (TRF) has financed over 900 supermarkets in underserved areas of Pennsylvania and this model has encouraged similar programs on New York, Louisiana, and California (TRF, 2012). Retail chain Walmart has announced plans to open 275 to 300 stores in food deserts by 2016. Pharmacy chain Walgreens has claimed that 45% of its stores are located in food deserts and are equipped with fresh produce.

Food deserts, on the contrary, are also known as food swamps, because in these areas nutritious foods such as fruits and vegetables are more expensive than processed filler foods, commonly known as junk food (Yngve, Margetts, Hughes, & Tseng, 2009).
Lack of private transportation and longer commuting times offered by public transportation create a geographic barrier to healthy food outlets, such as farmers markets or full-scale grocery stores (Lancaster & Smith, 2010). Lower-income families usually rely on these calorie-heavy, nutrition-free choices, as these foods can sustain them at a cheaper price (Metallinos-Katsaras, Sherry, & Kallio, 2009) and they are always available everywhere – schools, street corners, hospitals, or gyms. The high price of healthy and fresh foods cannot help impoverished families take advantage of a larger variety of healthy choices (Jha, 2009). Consistent and frequent consumption of cheap, calorie-heavy, and nutrition-free foods by lower-income children or adults lead to short- and long-term health problems, such as obesity, diabetes, and other chronic diseases (Gundersen & Kreider, 2009; Metallinos-Katsaras et al., 2009). In cases where even these food choices are unaffordable, families must adapt and adopt some coping strategies to compensate for the lack of food: these include eating less-varied diets, participating in federal food and nutrition assistance programs, and obtaining emergency food from food cupboards or soup kitchens (Nord et al., 2009).

According to a recent report published by the International Human Rights Clinic (IHRC), a human rights approach to food should shift the focus from food assistance as charity to adequate food as a human right – a right that is universally recognized. This approach puts the pressure on the government so that it prioritizes the needs of the most vulnerable populations and ensures their basic needs and fundamental rights (IHRC, 2013). Until a human rights approach to food is adopted by the government, NPOs will continue to play a crucial role in providing or distributing food that is physically and
economically accessible, safe, nutritious, adequate, and culturally acceptable by vulnerable populations – the conditions set by the food justice theoretical framework. Researchers have agreed that NPO-driven food-related projects are “the core of the food justice movement” (Alkon & Agyeman, 2011, p. 345).

Justification of Study

The justification of this study lies in its unique theoretical and methodological approach. Geographic Information Systems (GIS) has been used to analyze spatial dimensions of ecological phenomena (Fortin & Dale, 2005). But I have not found any GIS study that, following a social-ecology framework, intersects food justice, food geography, community capacity, and social capital/social network theories. This research aims to fill this gap in knowledge by using a mixed methodology and assessing the advantages of such an approach. Understanding the causes of food insecurity from a broader or multi-theoretical perspective will help in the design and targeting of appropriate interventions. A place-based approach was needed for this study, because food insecurity exists in specific locations and most NPOs provide programs at fixed locations as well. Also, the ability of NPOs to positively impact, improve, or develop their communities is partially related to their ability to reach local residents and stakeholders (Twombly, De Vita, & Garrick, 2000).

*Theoretical approach.* In recent years, we have seen an emerging trend of geographic research – human, social, or spatial – on the broader topic of food production, distribution, and consumption in urban environments. Food geography literature
primarily addresses three types of food access issues – geographic, economic, and informational (McEntee & Agyeman, 2010). Food geography, as a theory, is still evolving and is tied with the concepts of CFS and food justice. A theoretical blending of all these theories or approaches is needed to comprehensively understand the issue. Although a social-ecology approach re-harmonizes human processes with ecological processes, few studies have taken this approach to analyze food insecurity and related issues or examine NPO programs that address those issues (Story, Kaphingst, Robinson-O’Brien, & Glanz, 2008; Companion, 2010; Lancaster & Smith, 2010). Few studies have followed a food justice narrative to incorporate the issues of hunger and food hardship with different aspects of the food movement (i.e., local food production and distribution, food consumption habit and health, and community engagement) in one single study (Alkon & Agyaman, 2011). Finally, not many studies have explored new forms of social capital and innovative forms of social connectedness through various NPO-driven programs, as discussed by Putnam and Feldstein (2003) before a decade.

There is agreement that no single NPO or other organization can solve the type of multi-faceted problems that the world faces today (i.e., poverty, global warming, education, and healthcare reform). Food insecurity is such a complicated and multi-faceted issue. A strong understanding of inter-organizational networks is critical for NPOs, because such networks are at the center of NPO activities, they increase NPO capacity to fulfill stated missions, and they contribute to the social capital of the communities in which NPOs operate (Johnson, Honnold, & Stevens, 2010). Bess, Speer, and Perkins (2012, p. 528) commented that only a few studies have examined “the
ecology of local organizations in which a coalition is embedded and how this broader network of relations influences coalition formation and participation”. The authors also argued for examining the role of context in organizational coalition development.

In order to broadly understand NPO-driven programs and their contribution, it is important to study NPOs’ inter-organizational networks. Participation in such networks can enhance or increase NPOs’ innovation in services, acquisition of resources, organizational performance, collaborative relationships, and NPO’s chances of survival (Coleman, 1988; Ahuja, 2000; Hager, Galaskiewicz, & Larson, 2004; Guo & Acar, 2005; Galaskiewicz, Bielefeld, & Dowell, 2006). Understanding the geographic distribution of NPOs and their programs is a useful starting point to realize community resources and their geographic proximity to local needs that are related to food security and food justice.

Methodological approach. Following food justice theory and using a mixed methods approach, this study aims to identify a large set of indicators and variables and develop a model that comprehensively measures food insecurity at a local level, such as a census tract or a neighborhood. As discussed in detail in Chapter 4, most studies related to CFS have looked at the issues of hunger and poor access to healthy and fresh food. This study argues that the concept of CFS, specifically at the scale of inner-city neighborhoods, goes beyond hunger issues and typical food desert analysis where using only GIS data such as supermarkets, grocery stores, median income, or car ownership is a common practice. In addition to the households living in poor inner cities who are already food insecure, other households might be vulnerable to such insecurity. Those
vulnerable households should not be excluded in current discussion and analysis. I expect to find out that results from only “geographic access”-based CFS assessment would be significantly different than a comprehensive “food justice”-based assessment that also includes economic and informational access, public health and food culture, and vulnerable people and places in urban environments.

Social capital and social networks have spatial or geographic dimensions, even though sociologists have always focused on only relational space (Metcalf, 2005; Nam, 2011). In 2005, Michael Batty indicated geographic social network analysis as one of the next steps for future research (Batty, 2005, p. 168). Yet today, few studies have tried to integrate inter-organizational network research and GIS-based spatial network analysis. GIS has been integrated to digital social network analysis (i.e., Facebook or Twitter networks), but integration of relational and spatial network analysis is still at the infancy stage.

In summary, this study will contribute to methodology and theory in four ways. First, it will demonstrate an untraditional methodology to assess and measure neighborhood food insecurity by using mixed methods/ qualitative GIS and a food justice/ social ecology framework. Second, the list of variables and GIS-based models that will be developed to measure neighborhood food insecurity and NPO programs will be applicable in other cities. Third, this research will generate new knowledge regarding the barriers and bridges to food justice in lower-income urban neighborhoods. It will for the first time intersect concepts from the following research areas: urban social ecology, food justice, CFS, food geography, social capital, social networks, community
development, community-based organizations, qualitative GIS, and GIS and society. Finally, this study will expand our understanding of the role of NPOs in the fight against hunger and food insecurity and their inter-organizational relationships. The results and findings will help NPOs make better decisions in implementing their activities and programs. Through this analysis, this study will advance the new line of research that focuses on the integration of GIS and social network analysis.

Research Questions

My overarching exploratory research question was: What is the role of NPOs in addressing community food insecurity and vulnerability within the context of the urban environment? This broader question generated five specific goals, driven by five sets of research questions.

Question Set 1: Using a food justice framework, how do we comprehensively measure community food insecurity and vulnerability at a local level, such as a census tract or a neighborhood? What indicators and variables should we consider and why? How can we create a place-based food insecurity index and apply it at the urban neighborhood level? Goal: Understanding of place-based food insecurity and vulnerability.

Question Set 2: What are the dynamics of place-based charity food programs or street-level food assistance programs to combat food insecurity and vulnerability? Do these programs address the needs of the food insecure or hungry population? Is there any service gap or other operational challenges? Do the NPOs intervene where there are the
greatest needs? Goal: Understanding the dynamics of place-based charity food programs to combat food insecurity and vulnerability.

Question Set 3: How do NPOs address food access issues by providing convenient access to healthy and affordable food through alternative food outlets? Do the NPOs intervene where there are the greatest needs? Is there a common spatial pattern throughout the city? Goal: Understanding the ways NPOs address food access issues by providing convenient access to alternative food outlets.

Question Set 4: How do NPOs address food insecurity and vulnerability through their food-related programs and events that are tied with community development and community capacity building efforts? Do these programs and events respond to the overall food insecurity and vulnerability scores? Goal: Understanding the ways NPOs address food insecurity and vulnerability through food-related programs and events that are tied with their community development and community capacity building efforts.

Question Set 5: What is the nature of inter-organizational relationships and networks among NPOs that address community food insecurity and vulnerability? Is there any association between organizational network density and PFIVI scores? Is there any association between bridging/bonding networks and food insecurity and vulnerability scores? Goal: Understanding the spatial patterns of inter-organizational relationships.

Structure of the Dissertation

In Chapter 2, literature review, I explain the social-ecology framework which was considered as the theoretical backdrop of this study. Then I discuss food-related
literature, which includes concepts such as global food security, community food security, food justice, and food geography. Next I discuss literature around NPOs, community capacity building, community development, social capital, social networks, and organizational networks, all under a group named NPO-related literature. Finally, I discuss a summary of all these core concepts and how those are relevant to this study.

In Chapter 3, I lay out the study context by discussing post-industrial US cities and policies and debates relevant to food insecurity, followed by a discussion on the study location, i.e., the City of Philadelphia, its neighborhoods and planning districts, and its state of food insecurity and hunger. Then I provide details on the methods used to address each of the five research questions, brief overviews of those methods, rationale for using those methods in addressing my questions, and analysis units. More detailed explanations of the research methods and tools used in this study are presented in Chapters 4 through 7.

In Chapter 4, I use food justice theory to analyze and measure place-based food insecurity, specifically within the context of lower-income neighborhoods of post-industrial US cities. Based on an extensive review of methods used in food access/food desert/CFS literature, I discuss the development of a Place-Based Food Insecurity and Vulnerability Index (PFIVI) that used GIS and qualitative methods. Finally, I discuss the application of the PFIVI index to the City of Philadelphia as an example.

In Chapters 5, 6, and 7, I examine the ways NPOs address the issues of food insecurity and vulnerability within the context of urban neighborhoods. These chapters discuss three types of interventions that NPOs embark on – providing hunger relief
(Chapter 5), providing healthy and affordable food through alternative food markets and programs (Chapter 6), and offering food-based programs and events tied with community capacity building and community development efforts (Chapter 7).

Finally, in Chapter 8, I provide a summary of the findings and discuss the contribution of this study to theory, methods, practice, and policy. I also offer some possible future research agendas. Finally, I provide some concluding remarks on the role of NPOs in promoting food justice in post-industrial inner-city neighborhoods.
CHAPTER 2
THEORETICAL BACKGROUND

This study examined the role of NPOs to address the issues of community food insecurity and vulnerability within the context of urban disadvantaged neighborhoods. This work was based upon an assumption that there are three types of place-based interventions that NPOs embark on – providing hunger relief, providing healthy and affordable food through alternative food markets and programs, and offering food-based programs and events tied with community capacity building and community development efforts.

I approached the study from a social ecology theoretical framework that includes the discussions on both the physical and social characteristics of a city. This theoretical backdrop provided me a broader and unique scope to analyze food security, community capacity, community development, and other theories this study relied on. For example, my understanding of the connection between NPOs and their place-based interventions to combat food insecurity and vulnerability came from various literatures, including community capacity building, community development, social capital and social network, and theories around the nonprofit sector. But before examining the role of NPOs, I sought to better understand the meaning and nature of place-based food insecurity and vulnerability through an array of food-related literature, including community food security, food geography, and food justice. Finally, I connected all these theories with the broader theoretical framework of urban social ecology. In this chapter, I briefly discuss
urban social ecology and all the theories mentioned above. Further discussions on the relevance of these theories to this research will appear in forthcoming chapters.

Social Ecology Framework

The social ecology theoretical framework has its roots in ecology and urban ecology. Ecology, originally defined by Ernst Haeckel in 1870, is “a study of the morphology of collective life” (Hawley, 1950, p. 67). Urban ecology literature has two distinct approaches – one emerges from a scientific definition, and the other from urban planning (Sukopp, 1998). Urban ecology, according to the scientific definition, studies the distribution and abundance of organisms in and around cities. On the other hand, the urban planning perspective focuses on designing environmental amenities of cities and reducing environmental impacts (Deelstra, 1998). The key factors of urban ecology include urban growth, spatial patterns, expansions, social organizations, and their organizational structure (Melosi, 2003, p. 197).

An urban area is a place where human activities are more concentrated and influence urban ecosystems more intensely. “The shape and dynamics of cities are the result of physical, biological, and social forces” (Grove, Hinson, & Northrop, 2003, p. 167). Over the last two decades, a growing number of ecologists have shown interest in studying the impacts of human activity on natural ecosystems. They have considered urban sites (rather than pristine environments) to be a good venue to conduct ecological research. Pickett, Burch, Dalton, Foresman, Grove, and Rowntree (1997) provided examples of social system components that can be incorporated into human-ecological
models of urban ecosystems. These included social institutions, social dynamics, social order, and social resources. A new group of ecologists in the late 20th century realized that urban ecology (i) needs an understanding of humans and institutions that make decisions that alter existing spatial patterns and (ii) should include social drivers and human factors, in addition to biological drivers and factors (Grimm, Grove, Pickett, & Redman, 2000). Social drivers include flow of information, cultural values and perception, and institutions/organizations. Core factors include demographic patterns, economic systems, power hierarchies, land use and management, and the designed environment.

Social ecology, as defined by Pickett, Costanza, Cadenasso, Grove, Nilon, Pouyat, and Zipperer (2001, p. 111), “is a life science focusing on the ecology of various social species [including Homo sapiens]”. A social ecology approach in a community setting may include topics such as demographics, economic structure, political structure, transportation, class, race, religion, public health, and leisure and recreation (Grove et al., 2003, p. 178). According to Roseland (2000), social ecology also discusses equity, social justice, and societal struggles against domination and hierarchy, including the struggles of women, blacks, native peoples, and gays. Here is an elaborated definition:

Social ecology is the study of both human and natural ecosystems, and in particular the social relations that affect relationship of society as a whole with nature… Social ecology goes beyond environmentalism, insisting that the issue at hand for humanity is not simply protecting nature but rather creating an ecological society in harmony with nature. The primary social unit of a proposed ecological society is the eco-community, a human-scale, sustainable settlement based on ecological balance, community self-reliance, and participatory democracy. (Roseland, 2000, p. 92)
Pickett et al. (2001) framed a social-ecological approach to integrate the scientific and urban planning approaches of urban ecology with social and economic understanding. They have challenged ecological theory to explain the ecology in and of cities. Ecology in cities includes the nature of the physical environment, such as climate, hydrology, soils, vegetation, bio-diversity, and land use (Pickett et al. 2001, p. 99). Ecology of cities includes the social dimensions of urban ecology, such as social structure and the social allocation of natural and institutional resources (Pickett et al. 2001, p. 99). The social ecology framework is connected to many relevant theories and approaches.

*Hierarchy theory.* In order to understand urban social ecology at community level, we need to understand the human ecological system from a hierarchy theory. The human ecological system has five types of socio-cultural hierarchies that are critical to patterns and processes of human ecological systems: wealth, power, status, knowledge, and territory (Burch & DeLuca, 1984). The unequal access to and control over the allocation of critical resources (natural, socioeconomic, or cultural) within and between households, communities, regions, nations, and societies result in rank hierarchies (Machlis, Force, & Burch, 1997). Such unequal distribution “is frequently related to class, race, or ethnicity” (Grove et al., 2003, p. 173).

*Community-centric approach.* Shu (2003) discussed a community-centric approach to study urban and human ecosystems that may include disciplines that are traditionally not included in ecological studies. In particular, social scientists can study “cultural differences and conflicts when defining issues and developing solutions” (Shu, 2003, p. 41). Shu also argues that a holistic approach to study urban ecosystems should
not incorporate only physical and biological resources, but also human, social, economic, and cultural factors or resources.

*Sustainability framework.* Beatley and Manning (1997) discussed urban ecology from a sustainability framework. This concept, developed in the last two decades, is an extension of the environmental movement initiated in the mid-20th century, concerned with broad range of environmental impacts related to urbanization including demographics, economics, institutions, land use, and the designed environment (Grimm et al., 2000). In terms of the social aspect of sustainable development, the concept of equity encompasses environmental, social and economic justice, social equity, quality of life, freedom, democracy, participation and empowerment (Jabareen, 2006, p. 188). Contemporary urban developments in the U.S. “raise questions about social justice and fairness” (Beatley & Manning, 1997, p. 35). A sustainable community is a “just and equitable community”, a place that “strives to be gender neutral and to ensure physical access and social opportunity to all its members” (Beatley & Manning, 1997, p. 35). Communitarians believe in personal responsibility and commitment to a larger “we-ness” and advocate for communities where “people are committed, invested, and involved” and places where “people know and care about one another, participate in community activities, and take responsibility for the condition and health of the community and the environment” (Beatley & Manning, 1997, p. 37).

Following this discussion, a summary of the social ecology framework is provided in Table 1.
Table 1

*The Social Ecology Framework*

<table>
<thead>
<tr>
<th>Social Ecology in Cities</th>
<th>Social Ecology of Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical forces</strong></td>
<td><strong>Social forces</strong></td>
</tr>
<tr>
<td><strong>Physical resources</strong></td>
<td>Human, social, economic, and cultural resources</td>
</tr>
<tr>
<td>Core factors: land use and management, transportation, designed environment, and leisure and recreation</td>
<td>Core factors: demographic patterns, economic systems, power hierarchies/political structure, class, race, and religion, and public health</td>
</tr>
<tr>
<td>Study areas: (i) nature of the physical environment, such as climate, hydrology, soils, vegetation, biodiversity, and land use (ii) urban growth, spatial patterns, expansions (iii) impacts of human activity on natural ecosystems (iv) eco-community, a human-scale, sustainable settlement based on ecological balance</td>
<td>Study areas: (i) social dimensions of urban ecology, such as social structure and the social allocation of natural and institutional resources (ii) social organizations and their organizational structure (interorganizational relationships, “communities” of organizations, collective forms of organizational adaptation, and collective strategy) (iii) social system components: social institutions, social dynamics, social order, and social resources (iv) community self-reliance, quality of life, freedom, empowerment, and participatory democracy (v) social drivers: flow of information, cultural values and perception, and institutions and organizations (vi) environmental, social, and economic justice, equity, and societal struggles against domination and hierarchy for people of all class, race, gender, or ethnicity</td>
</tr>
</tbody>
</table>

Food-Related Literature

*Global Food Security*

Global food security (GFS) includes discussions on the multifaceted challenges of malnutrition or malnourishment, including energy deficiencies, nutrient deficiencies, and problems from overweight and obesity related to excessive energy intake (McDonald, 2010, p. 152-53). Agribusiness has been considered a response to global food insecurity.
and world hunger. The “Green Revolution” that started in the 1940s-50s encouraged a large-scale, corporate-owned agricultural industry that could raise industrial food production to meet ever-increasing global demand. Agribusiness was based on specialized production, land concentration, and trade liberalization (McMichael, 2009).

Industrialized agriculture or agribusiness evolved through three revolutions: (i) the mechanical revolution in the early 1900s, including tractors and associated farm machineries; (ii) the chemical revolution after the end of WWII that included synthetic fertilizer and pesticides; and (iii) the biotechnology revolution in the 1980s that promoted genetic engineering for both plant and animal agriculture (Lyson, 2004).

At present, a handful of large vertically-integrated corporations control food production and distribution globally, aided by transnational institutions such as the World Bank and many national governments (Blay-Palmer, 2008). Taking advantage of globalization, agribusiness promotes a practice that allows dumping of artificially cheap agricultural goods, subsidized by the US or European governments, on the third-world market at prices below the cost of production which at the same time prohibits third-world governments to subsidize or protect local farmers (Shiva, 2000).

Agribusiness has a “productionist land ethic” where businesses try to produce as much as possible and as cheaply as possible without regard to environmental costs or social effects (Davis, 2009). Critiques of agribusiness have expressed deep concerns about ecological degradation, economic and political imbalance, and social and ethical issues (Stevenson & Lezberg, 2007). The impacts of agribusiness now include diminishing returns, a surplus of unused food, lower-quality products, an increase in
food-borne illnesses, and associated environmental and economic impacts (Roberts, 2008). Research also looked at the dangers associated with genetic engineering of food, which is used as a solution to the food supply shortage (Magdoff, Foster, & Buttel, 2000).

Social inequities exist in agribusiness in terms of low wages, poor working conditions, loss of land, hunger and starvation, misdistribution of resources (Allen, 2010), colonization of national food systems, destruction of peasant agriculture (Holt-Giménez, 2009), and violations of human rights (Schanbacher, 2010).

In the US, resistance to agribusiness appears in the forms of (i) protecting family farms, (ii) saving the environment, and (iii) promoting food safety (Henderson, 2000, p. 176). The US political and economic systems spend billions to remove food from the market, to limit production, to retire land from production, and to guarantee and sustain profits for large producers of basic crops (Nestle, 2007). Following the economies of scale, many small or family farms were merged with larger ones or went out of business. In the latter half of the 20th century, multinational food industries took control of a large sector of the US food system, controlling 60% of the retail purchases of food (Lyson, 2004, p. 4). This trend has affected the minority population. In the 1930s, 14% of all US farms were owned by minorities, and in the late 1990s, less than 1% remained black owned (Magdoff et al., 2000, p. 13).

In the late 20th century, international organizations, governments, and businesses tried to redefine the meaning of GFS by including some of the concerns raised by farmers, consumers, and small businesses. For example, in 2001 the Food and Agriculture Organization (FAO) defined their objective of achieving food security as a
situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2012). The objective of GFS, however, has been misused to justify policies that (i) prioritize yield and delivery of food to consumers by any means and (ii) encourage food aid for the hungry. Other consequences include the use of genetically-modified seeds and the shifting of food production from diverse crops for local markets to monocultures for export. Many small producers throughout the world are put out of business by subsidized imports. Therefore GFS-based policies have failed to protect consumers from rising food prices, as evident during the world food crisis of 2007-2008. Unfortunately, under the GFS doctrine world hunger is actually increasing, and at the same time adverse impact on our environment is increasing. Food has become a commodity for maximizing profits for few agribusiness and commodity traders rather than a source of nutrition for the world population.

In the midst of soaring global food and oil prices, a recent report published by the United Nations has challenged the status quo: World hunger and climate change cannot be solved with industrial farming. According to this report, small-scale farmers can double food production in 10 years by using simple farming methods used in many countries of the Global South, such as insect-trapping plants in Kenya or weed-eating ducks in Bangladesh's rice paddies. Drawing from scientific evidence, the report suggests that agro-ecological methods outperform the use of chemical fertilizers in boosting food production in regions where the hungry live (De Schutter, 2010).
Community Food Security

CFS is a term used to define food security at the local level by addressing some of the criticisms against GFS. Based on commonly-used definitions by the US government and scholars, CFS means having continuous “access” to adequate food for an active, healthy life (Nord et al., 2009) and to food that is affordable, nutritionally adequate, safe, socially or culturally appropriate, and personally acceptable (Kendall & Kennedy, 1998; Anderson & Cook, 1999). CFS is not only a numerical aggregation of household-level food security, but is also related to broader socio-economic-institutional factors that affect the quantity and quality of food and its affordability (McCullum, Pelletier, Barr, & Wilkins, 2003, p. 189). CFS includes three types of food access issues – geographic, economic, and informational (McEntee & Agyeman, 2010).

CFS or other similar movements, however, are not beyond criticism or debate. CFS as a concept in its early days was divorced from consideration of how food is produced and by whom. The movement has been criticized for not being truly democratic, just, and sustainable. One important criticism focuses on racial exclusion, as there is a lack of minority participation in the decision making process in this movement. The following statement, as an example, came from a CFS activist who posted this in a national email listserv Comfood:

Racism and classism have operated pervasively in the food movement, the community food security movement and the food justice movement for decades. Each new cohort of participants in these movements makes this discovery and renews the endless conversation. I was part of the new cohort making my discovery at the first annual meeting of the Community Food Security Coalition [CFSC] in Los Angeles in 1997, when [we] challenged the CFSC leadership on the absence of people of color in the leadership of CFSC. Three of us were elected to the first Board of
Directors at that meeting, and we immediately addressed this issue. For all of the amazing accomplishments of the Coalition in driving the development of the community food security movement—and they are many—the Coalition could not successfully and constructively come to grips with racism. For that reason a group of us finally left the Coalition and engaged in forming what is now known as the Growing Food and Justice Initiative (GFJI). (Comfood, 2012)

To address such concerns, CFS as a social movement has been shifting its focus from emergency food service to the “right to food”, and more recently to a food justice movement (Wekerle, 2004). According to this new understanding, the world produces enough food for everyone, but there is a lack of political will for a fair distribution of that food, regardless of people’s economic ability. This is more applicable to the wealthiest countries in the world, such as the US, where food insecurity is considered a result of poverty and failed policies that could not prioritize the needs of lower-income citizens. The new meaning of the CFS movement can be better interpreted within the concept of food justice.

Food Justice

Food justice is a movement that has been theorized by scholars in the last couple of decades. The theoretical context of food justice comes from environmental justice. The concept of Food justice, like the concept of food sovereignty, is considered a critique or response to industrialized agriculture or agribusiness. Food justice is a broad concept. Both as a theory and a grassroots movement, food justice connects to literature on democracy, citizenship, community development, community resilience, networked social movements, and social and environmental justice (Wekerle, 2004; Gottlieb & Joshi, 2010; Alkon & Agyeman, 2011). It is (i) a place-based movement that advocates
for engaged citizenry through local organizing and community development, and (ii) a networked movement, “incorporating everyday resistances, oppositional practices, and state agencies, which shape policy processes and outcomes at various scales” (Wekerle, 2004, p. 379). The holistic spectrum of food justice and food sovereignty does not narrowly focus on only food production and distribution, but includes farmers, consumers, communities, markets, climate, ecosystems, soils, and biodiversity.

Food justice is a grassroots movement for a sustainable food and agriculture system that has strong feelings for civil rights and social justice and is shared by “organic and low-input farmers; food, farming, farmworker, community food security, and hunger organizations; animal rights activists; and environmental, consumer, and religious groups” (Henderson, 2000, p. 175). According to the food justice concept, the world produces enough food for everyone, but there is a lack of political will for a fair distribution of that food, regardless of people’s economic ability. It considers food as a “right”, not a “commodity”. Food justice frames local or community food system initiatives as both “the practice of democracy” and as “means of de-linking from the corporate global food system” (Wekerle, 2004, p. 379).

The framework ensures that the benefits and risks of how food is grown, processed, transported, distributed, and consumed are shared equitably (Gottlieb & Joshi, 2010). The movement seeks to “advance the knowledge about the justice dimensions of what, where, and how we eat while also describing opportunities for moving toward a more just, healthy, democratic and community-based food system” (Gottlieb & Joshi, 2010, p. 10).
Under the food justice framework, CFS can be interpreted as a concept that relocalizes food systems, de-links them from the corporate global food system (Starr, 2000; Wekerle, 2004), produces food “through a sustainable food system that maximizes community self-reliance and social justice” (Hamm & Bellow, 2003, p. 37), and supports an equitable food system that is supportive of collective rather than only individual needs and created by democratic decision-making (Anderson & Cook, 1999). The movement seeks to re-link local food production and local food consumption by emphasizing local and regional food systems and prioritizing the needs of lower income people, but does not substitute for the governmental hunger safety net (Allen, 1999).

Food Geography

Food geography, as a theory, is still evolving and is tied with the concepts of CFS and food justice. Similar to CFS, the food geography literature addresses three types of food access issues, but one of the primary foci has been on the geographic access that includes literature on food deserts or food swamps. Food deserts, in an urban setting, usually represent lower-income areas where economically, socially, politically, and historically disadvantaged populations do not have access to fresh, healthy, affordable, and culturally-appropriate food. These areas are also known as food swamps, because there often have abundance of cheap, calorie-rich, but nutrient-poor foods, and populations in these areas, adults or children, face food-related health problems. Individuals and families living in a food desert or food swamp incur extra costs when access to healthy and fresh food is low for a number of reasons. These reasons include higher prices at corner stores, increased consumption of fast foods, or transportation costs.
to supermarkets located outside of the area in question (Rose, Bodor, Swalm, Rice, et al., 2009). Food deserts have been associated with poor public health outcomes by many researchers. For example, Mobley, Root, Finkelstein, and Khavjou (2006) found that the presence of corner stores or convenience stores is associated with higher obesity rates among lower-income women, but the presence of supermarkets is associated with lower obesity rates.

There is much ambiguity in the concept of the food desert, and most literatures attempt to answer the question of whether food deserts even exist. The ambiguity comes in the form of the varied definitions of the concept itself. For example, food deserts have been defined as “areas with poor food facilities” (Caraher, Dixon, & Lang, 1998), “populated areas with little or no food retail provision” (Cummins & Macintyre, 1999), “socially deprived areas within cities that have poor access to food retailers” (Apparicio, Cloutier, & Shearmur, 2007), and “an area in the [US] with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower-income neighborhoods and communities” (U.S. Farm Bill, 2008).

Although researchers such as Raja, Ma, and Yadav (2008) argued for policies that support high quality smaller grocery stores serving healthy, affordable, and culturally appropriate food to inner-city minority residents, many others (such as Short, Guthman, & Raskin, 2007) have expressed caution about the actual availability, variety, and price of such products offered by similar stores. Based on a widely-accepted assumption that supermarkets and full-scale grocery stores primarily provide most of our food options, food deserts have been typically defined as food environments that do not have such food
retail resources or product offerings (Lewis, Sloane, & Nascimento, 2005; Moore & Roux, 2006). The graphic representation of food deserts can effectively demonstrate the serious consequences resulting from the scarcity of healthy food sources or the imbalance of food choices in many urban neighborhoods (Gallagher, 2009).

A consumer’s nutrition environment is the area surrounding a place where a consumer buys food. Researchers have discussed a number of “environmental” determinants of consumption by the customers, including product availability, quality, and price (Glanz et al., 2007); the changing nature of the food supply, increased dependence on foods consumed away from home, and food advertising, marketing and promotion (St-Onge et al., 2003). According to many researchers, socio-economic factors such as income, education, gender, age, and transportation are significantly related to the consumption of fruits and vegetables (Havas et al., 1998; Dibsdall et al., 2003; Rose & Richards, 2004; Pearson et al., 2005; Casagrande et al., 2007; Cassady et al., 2007; Powell et al., 2007). Researchers have found relationships between shopping at supermarkets and an increased consumption of fruits and vegetables (Morland et al., 2002; Zenk et al., 2005).

NPO-Related Literature

Nonprofit Organizations

NPOs, which are alternatively known as third sector organizations, non-governmental organizations (NGOs), civil society or citizen sector organizations, or private voluntary organizations, often refer to local, national, or international
organizations that lie outside of the government and business sectors (Najam, 2000).

Some NPOs are nonprofit corporations, but others are trusts, charities, foundations, and more loosely-formed voluntary associations. Many functions provided by NPOs may also be performed by public agencies and for-profit organizations (DiMaggio, Weiss, & Clotfelter, 2002). Many NPOs, though private, receive mandates and/or funding from government agencies. According to the World Bank (2010) classification, NGOs (or NPOs in this case) can be operational (more involved with what happens “in the field” with respect to specific programs) or advocacy (more concerned with influencing policy) or both. A participatory NPO is characterized by self-help projects undertaken by local people; and an empowering NPO facilitates the awareness, the organization, and the force to help beneficiaries solve local problems.

In the US, although charitable organizations have a long history, a wide range of new institutional forms of NPOs started to develop in the 1970s. These organizations vary significantly in terms of their mission, scope, scale, and geographic service areas – ranging from grassroots organizations without assets or employees to foundations, universities, or health care services with multi-billion-dollar budgets and thousands of employees (Hall, 1994). NPOs such as community-based organizations (CBOs), community development corporations (CDCs), and faith-based organizations, have been playing important roles in the housing, community, and economic development of lower-income urban communities for the past 40-50 years. Overall, these organizations have offered various types of programs to construct and manage affordable housing, empower local residents through job training and entrepreneurial assistance, build community
leadership, provide social services, and empower lower-income people to take charge of their own future. US-based NPOs are characterized by their federal tax-exemption status and eligibility to receive tax-exempt gifts, their nature of service activities that benefit both the members and non-members of those organizations, and their organizational structure that is controlled by a private independent board of directors (Kanter & Summers, 1987; Salamon, 1987). These organizations can invest their surplus earnings, if any, to future services or distribute them to people not related to the organizational power structure.

Foundations and government agencies are generally considered the largest and most influential supporting agencies to the NPOs (Hall, 1994). Since NPOs need to rely on consistent external support, their missions, behavior, actions, and outcomes can be heavily influenced by those supporting agencies (Tuckman, 1998). Even donations, when “restricted”, may have influences similar to foundation grants or government contracts and may be akin to fee-for-service arrangements (Weisbrod, 1998). Although NPOs carry a lower administrative cost, which can be considered an advantage over government agencies, they also need to carry “free riders”, devote significant resources to securing grants, donations, contracts, and building memberships (Douglas, 1987), and perform quite similarly as for-profit organizations in production, marketing, and the distribution of services (Silk, 1994).

The government-NPO relationships are considered “complex and dynamic” (Smith & Gronbjerg, 2006, p. 221). Coston (1998) categorized this relationship as repression, rivalry, competition, contracting, third-party government, complementarity
and cooperation. As government generally has control of more resources than any particular NPO, it has more power. NPO influence and participation increase as government influence and participation decrease. Najam (2000) argued that since ends are similar, different means can exist to complement each other, perhaps based on comparative advantage. Because NPOs and governments can develop mutually beneficial transactions with each other, government-funded public services provided by NPOs have increased markedly over recent decades (Coston, 1998; Najam, 2000; Smith & Grønbjerg, 2006). Citing a number of references, Smith & Grønbjerg (2006) argued that since many of the NPOs resulted from “social movements” and foster social values, they should take over many activities that have been assumed by government. Instead of resisting pressure from these NPOs, the government shows a greater tendency to work together with them.

A few criticisms or issues that NPOs deal with within the urban neighborhood context include the following: (i) In many cases, NPOs tend to respond less to the goals of their weaker constituencies than those of the strongest constituencies (Powell & Friedkin, 1987); (ii) Due to government budget cuts, increased privatization and outsourcing, and changes in the flow of resources from nonprofits to other types of organizations, NPOs face a growing sense of financial insecurity leading to greater competition for funding among and between other NPOs and other organizations (Light, 2000; Salamon, 1995); and (iii) Because NPOs generally do not provide goods but services, which is harder to assess (Kanter & Summers, 1987), and because they rely on
volunteers and lack clear hierarchical lines of authority (Kanter, 1979), NPOs enjoy substantial freedom from accountability (Douglas, 1987).

**Community Development**

In the late 1960s, philanthropies such as the Ford Foundation, in coordination with government officials, took an interest in NPOs, particularly CDCs, that were applying business and management skills in social missions targeted toward lower-income communities. Although effectively emerged in the 1960s, community development (CD) was informed by the ideals of the Progressive Era that offered principles of meaningful social intervention (Ferguson & Dickens, 1999). Following the Housing and Community Development Act of 1974, municipal and state governments started to channel funds to these organizations. However, budget cutbacks to CD programs started in the 1980s and have continued to the present (Gough & Accordino, 2013). CD-focused organizations, having their roots in the community, can interface with citizens more directly and effectively than local governments, and therefore can understand community needs and transform them into policy ideas with fewer institutional constraints (Gough & Accordino, 2013).

CD is commonly interpreted as asset building or capacity building to improve neighborhood quality of life (Ferguson & Dickens, 1999). CD has been defined as the “employment of community structures to address social needs and empower groups of people” (Mendes, 2009, p. 3). It is “[a] planned effort to produce assets that increase the capacity of residents to improve their quality of life. These assets may include several forms of community capital: physical [housing, streets, and infrastructure], human [labor
supply and skills], social [people and political], financial [flow of money through the neighborhood, i.e., banks, business, firms, and housing], and environmental [natural resources and environmental quality]” (Phillips & Pittman, 2009, [ ] are my insertions). Community-focused economic development is “[t]he process of creating wealth through the mobilization of human, financial, capital, physical and natural resources to generate marketable goods and services. The economic developers’ role is to influence the process for the benefit of the community through expanding job opportunities” (Phillips & Pittman, 2009).

CD as a concept is associated with improvement or a change in a positive direction, even if the consequences of such efforts may not be always positive. The outputs and outcomes of many CD efforts cannot be measured objectively, because comparing present conditions with the past may be a subjective judgment, made by people according to their own values and expectations. Since socio-economic issues such as poverty, hunger, and food insecurity are geographically situated, CD needs to be geographically situated as well. Table 2 provides details of various levels of CD organizations.

Civic engagement and community consensus are necessary components of CD initiatives (Silverman, 2004). Democracy is considered as one of the central ideas of CD, which needs to deal with various levels of complexity and uncertainty. The use of democratic structuring helps the NPOs to expand the capacity of community systems, to improve the quality of local planning, and to simulate development. According to CD theory, democracy can be achieved through selective participation – an idea that provides
people with the freedom to decide when and how to participate in the CD process. Thus, the role of people in the civic engagement process does not need to follow any particular format; it could be unique for each individual. “Community based interventions based on exploring the strengths of communities and individuals are often more effective than individual casework interventions in addressing social needs” (Mendes, 2009, p. 4).

| Table 2 |
|---|---|---|
| **Levels of Community Development Organizations** | | |
| **Level of Organization** | **Key Function** | **Examples** |
| Level 0 | Grassroots, network of social ties, volunteer-based | Block-Clubs, Neighborhood Watch Groups, Recreation Clubs, Voluntary Youth Service Clubs, Churches, etc. |
| Level 1 | Frontline, network with neighborhood, majority paid staff | CDCs, CBOs, YMCAs, Homeless Shelters, Public Schools, Banks, Local Businesses |
| Level 2 | Local support Organizations, Not representative of neighborhood residents | Public Facilities, Public Housing Authority, Public Education Department, For-Profit business, Banks |
| Level 3 | State & Federal Support, Not Representative of neighborhood residents | Legislative Committees, Federal Reserve, HUD, NCCED, News Media |

*Data Source: Stoutland, 1999*

Various authors have described CD Theory using different perspectives and languages, but they also shared some general concepts: (i) the strategies of CD Theory are distributive, participative, and human development (Pandey, 1981); (ii) the foci of CD Theory are the organization of community agencies, the developing of local competences, and political action for change (York, 1984); (iii) CD Theory advocates for collective problem solving, self-help, and empowerment (Schiele, 2005); and (iv) CD Theory includes discussions on developing social capital, social inclusion and exclusion, and capacity building (Payne, 1997). Networking, relationships, and partnerships are
considered essential for effective community development (Gilchrist, 2009; Gough & Accordino, 2013). For CBOs or CDCs located in disadvantaged urban neighborhoods or rural towns, partnerships with external organizations (bridging networks) are necessary to attract funds and expertise, both managerial and technical (Kretzman & McKnight, 1993; Ferguson & Stoutland, 1999; Rubin, 2000; Glickman & Servon, 2003).

**Social Capital**

My initial understanding of social capital comes from the community capital framework, as developed by community development scholars such as Emery and Flora (2006) and Chaskin (2001). According to this framework, there are core factors or capitals (human, financial, built, natural, political, social, and cultural) that influence a community’s capacity to deliver services, to solve problems, and to engage in decision making. Social capital is “the connections between people and between citizens and the institutions that serve them” (Cappella, 2002, p. 230). The construct of social capital comprises numerous distinct concepts, such as civic engagement, institutional trust, social connectedness, and social trust (Putnam, 2001; Zhang & Chia, 2006; Zhang, Johnson, Seltzer, & Bichard, 2010).

Bourdieu (1986) is often credited for providing the “first systematic contemporary analysis of social capital” (Portes, 1998, p. 3). Social capital, according to Bourdieu, is the network of relationships produced by investment strategies that are “individual or collective, consciously or unconsciously aimed at establishing or reproducing social relationships that are directly usable in the short or long term” (Bourdieu, 1986, p. 249). With similar arguments, Coleman (1988) explains that social capital is different than
other forms of capital, because its location is in the network itself rather than in the actors that are connected by the network (Coleman, 1988, p. S98).

The modern conceptualization of social capital was done by Coleman (1988) and later popularized by Putnam (1993, 1995, 2001). Social capital, either individual or collective, is characterized by social relations, formal and informal social networks, group membership, norms, trust, reciprocity and civic engagement (Bourdieu, 1986; Coleman 1988; Harper, 2001; Putnam & Feldstein, 2003). Along with physical capital, social capital offers “communities the potential to recover from dramatic change, sustain their adaptability, and support new growth” (Ungar, 2011, p. 1742). Social capital is a variety of entities that consist of some aspect of a social structure and facilitate certain action of individuals who are within the structure (Coleman 1988, p. S98). Social capital is characterized by “social networks, norms of reciprocity, mutual assistance, and trustworthiness” (Putnam and Feldstein, 2003, p. 2). It enables “participants to act more effectively to pursue shared objectives” (Putnam, 1995, p. 664).

Scholars tend to agree that social capital is composed of three elements: relationships, trust, and norms (Mandarano, Meenar, & Steins, 2011, p. 124). Social capital acts as a model: civic engagement leads to new relationships, new relationships lead to greater trust, and trust leads to more effective collective action and individual/social benefits (Rohe, 2004). Harper’s (2001, p. 3) understanding of social capital involves the property of the group, not of the individual: “The key indicators of social capital include social relations, formal and informal social networks, group membership, trust, reciprocity and civic engagement”. According to Ungar (2011, p.
“Physical and social capital … give communities the potential to recover from dramatic change, sustain their adaptability, and support new growth”.

Scholars such as Gittell and Vidal (1998) and Putnam (2001) identified and defined two types of social capital: (i) Bonding Capital (a network of people who already knew each other) and (ii) Bridging Capital (a network of people who did not know each other). Bonding social capital, which is good for “mobilizing solidarity” (Putnam, 2001, p. 22), is a measure of more like-minded social connections that reinforce our identities in lieu of challenging or expanding them. Bridging capital represents the strength of weak ties (Granovetter, 1973), and it links unique and diverse individuals to greater economic opportunity and broader mobilization. According to a model suggested by Strauss (2010), organizations first identify opportunities to generate bonding social capital with like-minded organizations and then identify new possible relationships with seemingly unassociated organizations that may yield bridging social capital. Many ongoing or new research studies are focused on newer communication tactics, such as social media, that are better suited to generating social capital for NPOs.

Social Network and Organizational Network

The social network of individuals, as well as of organizations, is at the basis of the social capital theory. Social networks, as both Coleman and Putnam agree, are the infrastructure of social capital, and they build social relationships that are formed by collaborative efforts (Mandarano, 2007). From the organizational theory perspective, “the social network approach views organizations in society as a system of objects (e.g. people, groups, organizations) joined by a variety of relationships” (Tichy, 1979, p. 507).
Collaborations or partnerships established between organizations are a part of the social networks that may lead to generating social capital (Briggs, 2004). Research suggests that NPOs may have significantly higher survival rates when they belong to an extensive inter-organizational network (Singh et al., 1991; Hager et al., 2004), but at the same time they are moderately embedded in an inter-organizational network instead of being weakly embedded or too deeply embedded in order to avoid too much dependence or encumbrance (Uzzi, 1997). On the contrary, Brass et al. (2004) found that a blend of strong (high interdependence) and weak (low interdependence) network ties can increase an NPO’s survival rate. Whatever the benefits are, sometimes it is not worth the costs of establishing, maintaining, and managing the network ties (Smith-Doerr & Powell, 2005), especially when those ties can weaken and compromise organizational goals and activities (Galaskiewicz et al., 2006). Moreover, due to lack of capacity (i.e., lack of staff or resources), smaller NPOs face difficulty committing to and maintaining such collaborations (Lewis et al., 2008).

According to Coleman (1988), social networks can be with or without closure. In a network with closure, most individuals know each other and the relationship of each to the others. This type of network can be highly effective at enforcing norms. On the other hand, in a network without closure, the circles of acquaintances may or may not overlap and the degree of overlap (if any) is unknown. This type of network can only weakly enforce norms and primarily rely on formal structures, such as courts and police. Similar to the concept of bridging and bonding social capital, NPOs may have bridging and
bonding networks, representing organizational networks outside or inside of an NPO service area respectively.

NPOs, including civic, religious, and community-based organizations, play an important role in building social capital on both the individual and community level by facilitating interactions among members through local chapters and meetings (see Becker & Dhingra, 2001; Putnam, 2001; Putnam & Feldstein, 2003; King, 2004). Social capital can be used to perform basic organizational processes of any NPO, such as “recruit and develop board members, raise philanthropic support, develop strategic partnerships, engage in advocacy, enhance community relations, and create a shared strategic vision and mission within the [organization] and its employees” (King, 2004, p. 471). Although social capital may not always serve an NPO’s needs in the way that physical capital can, it can be an advantage for that NPO in terms of acquisition of important resources needed by that organization (Strauss, 2010). According to Kegler et al. (2010), collaboration history has a great influence on organizational coalition formation. Usually the core members of a coalition are initially recruited based on their prior network connections and it is the core members who subsequently influence which organizations become new members (Kegler et al., 2010).

According to institutional theory, strategic alliances among organizations can originate from the motives to improve their reputation, image, prestige, or congruence (Chen & Graddy, 2010). Organizations seek partnerships, because they want to build networks and inter-organizational relationships, enhance their ability to gain future
contracts or achieve other goals, meet client goals, and improve organizational learning (Chen & Graddy, 2010).

Inter-organizational network (ION) is “the set of communicative processes in which individuals representing multiple organizations or stakeholders engage when working interdependently to address problems outside the spheres of individuals or organizations working in isolation” (Keyton et al., 2008, p. 381). Different theoretical approaches, such as access to resources, trust, power, and status, are used to examine the value of IONs (Zaheer et al., 2010). IONs may appear in various types and at various levels, including competition, money- or knowledge-transfer, coordination, inter-personal networks, and formal interlocks (Bergenholtz & Waldstrøm, 2011). Analysis of IONs may be based on the whole networks, interlocks, or strictly dyadic relations (Bergenholtz & Waldstrøm, 2011). Through IONs, NPOs can scale-up efforts, put more pressure on governments, have more influence than individual NPOs (Eade, 1997), and produce more efficient and effective solutions to clients (Provan & Kenis, 2008). However, there are examples of unfair and unbalanced IONs that may result in a master-servant culture (Townsend & Townsend, 2004), where a “dominant partner uses its power to regulate weaker parties which have no choice but to cooperate.” (Hardy & Phillips, 1998, p. 224)

Theoretically, Social Network Analysis (SNA) follows “the sociological axiom that all social actors, including both humans and organizations, are positioned in and influenced by larger social structures” (Johnson et al., 2010, p. 495), a term representing the persistent patterns of relationships among those actors (Laumann & Knoke, 1986). The primary goals of SNA are “to discover how relationships are patterned inside diverse
social structures and how those patterns influence both the flow of resources and the actions, opportunities and power of the social actors who operate within” (Johnson et al., 2010, p. 495).

*Community Capacity Building*

Capacity building has been defined by many scholars. While capacity is usually termed as the “ability” to carry out stated objectives (Goodman et al., 1998), capacity building is an indefinite or continuous “process” of improving that ability of a person, group, or organization (Brown et al., 2001). The “ability” may come in the form of the cultivation and use of transferable knowledge, skill, systems, and resources (Goodman et al., 1998) so that individuals, groups, or organizations can define and achieve objectives, recognize and solve problems, and understand and deal with their development needs in a sustainable manner (Horton et al., 2003). The “process” needs to be adjusted with ever-changing community issues and new challenges. At an organizational level, capacity building supports an ongoing approach to development that is based on equity, empowerment, and participation of grassroots and other organizations, while promoting inter-organizational partnerships and networks (Labonte et al., 2002).

The terms capacity, capacity development, and capacity building originated from applications in the fields of agricultural research, development, training, and management (Baillie et al., 2008, p. 1031). Research shows that communities that take asset- and capacity-building approaches to development can be more successful in meeting community needs (Flora & Flora, 2008; Green & Haines, 2008). In addition to providing important services, NPOs can also foster civic engagement and community mobilization
(Twombly et al., 2000). Community capacity is what makes well-functioning communities function well (Chaskin, 1999). Here is a definition:

[Community capacity is] the interaction of human, organizational, and social capital existing within a given community that can be leveraged to solve collective problems and improve or maintain the well-being of a given community. It may operate through informal social processes and/or organized efforts by individuals, organizations, and the networks of association among them and between them and the broader systems of which the community is a part. (Chaskin, 1999, p. 4)

The definition of community capacity is based on the relationship between human capital, organizational resources, and social capital used to solve problems and improve a community (Chaskin et al., 2001). An understanding of community capacity can be tied with social capital literature (Putnam, 1995). According to Coleman (1988), human capital is the knowledge and skills that a person has, and social capital is formed by community members building relationships with one another. People with stronger interpersonal relationships and stronger networks have better opportunity to gain human capital (Coleman, 1988).

Community capacity building has been defined in similar ways as community capacity. According to Taylor (2003), community capacity building is synonymous with human, social, and organizational capital (Taylor, 2003, p. 141) and these can be related to Bourdieu’s cultural, social, and political capital (Bourdieu, 1986, p. 1990). One of the well-known definitions of community capacity building was provided by Skinner (1997):

Development work that strengthens the ability of community organizations and groups to build their structures, systems, people and skills so that they are better able to define and achieve their objectives and engage in consultation and planning, manage community projects and take part in partnerships and community enterprises. It includes aspects of training, organizational and personal development and resource building,
organized in a planned and self-conscious manner, reflecting the principles of empowerment and equality. (Skinner, 1997, p. 1-2)

According to Chaskin (2001), the elemental characteristics in building community capacity are: (i) a sense of community, (ii) a level of commitment, (3) the ability to solve problems, and (4) access to resources. Community capacity can be strengthened by four strategies: (i) enhancing the abilities of the individuals, (ii) making the organizations stronger, (iii) building relationships among the individuals, and (iv) building relationships among the organizations (Chaskin, 2001). All of these strategies can build social capital directly or indirectly (Vidal, 2004, p. 165).

Community building is “both a means to neighborhood transformation” and “a principal outcome”, and community building efforts in urban neighborhoods are typically designed, catalyzed, and funded by non-profit social organizations (Chaskin, 1999, p. 1). This resembles Putnam’s (1995, p. 67) definition of social capital as “social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit”. Community building helps “promote or sustain the well-being of the community and its components (individuals, informal groups, organizations, social interactions, the physical environment)” (Chaskin, 1999, p. 3).

Community capacity building also has resemblance to collective efficacy theory. Collective efficacy is “the link between mutual trust and a shared willingness to intervene for the common good of the neighborhood” (Sampson et al., 1997). It is “best observed under conditions of challenge, reinforcing the idea that resolving conflict is an important part of civic engagement” (Sampson et al., 2005). Collective efficacy is
“perception of mutual trust and willingness to help each other” – a “measure of neighborhood social capital” (Cohen et al., 2008, p. 198).

A place-based community capacity building process includes the discussions of democracy, citizenship, and community economic development. Fallov (2010) has explained the strong relationship between capacity building and citizenship:

[C]itizenship demands certain capacities — for self-governance, participation, responsibility and control. At the same time, the acquisition of such capacities rests on the mobilization of local communities for active participation in [neighborhood] regeneration. Therefore, building community capacity has multiple interrelated purposes: it induces capacities necessary for active citizenship, it opens routes to inclusion, and it is an instrument for achieving efficient and responsive government. (Fallov, 2010, p. 795)

Critiques of community capacity building process argue that governments and politicians use these projects to minimize their accountability for larger social ills. “Taken together, they ['devolution’, ‘privatization’ and ‘community building’] are strategies for shifting the burden of social responsibility from the public to the private sphere” (Brown, 2003, p. 1). The process diverts attention from the larger causes of socioeconomic disparities to the responsibility of the disadvantaged individuals and thus places blame on the victim (Williams, 2004; Mowbray, 2005; Craig, 2007). Other critiques think that community capacity building projects can be used as a means to boost the reputations of government officials and politicians where the concepts of community, community capacity, and social capital can be misused (Mowbray, 2005).
Summary of Core Concepts

This research was designed around two broad topics – food insecurity and NPOs. In this chapter, I have provided an overview of food- and NPO-related literature relevant to this research, following a discussion on my overarching theoretical framework – urban social ecology. But how are all these theories relevant to each other? How are those theories relevant to disadvantaged urban neighborhoods?

Historically, the term community represents a place of social interaction. Warren (1972, p. 6) referred to a study of 94 definitions of the term community; the study found that 69 were “in accord that social interaction, area, and a common tie or ties are commonly found in community life”. Urban communities are potential spaces for “ecological citizenship”, interpreted as “the fulfillment of ecological aims in a city concerned with both caring for ecosystems and building better civic communities” (Light, 2003, p. 57). The term community is often used to refer to a neighborhood in the urban context. A neighborhood is “a geographically defined subarea of the city in which residents are presumed to share both spatial proximity and some degree of mutual circumstance, need, priorities, and access to the broader metropolitan area and the systems that have an impact on their lives” (Chaskin, 1999, p. 1).

In order to assess and understand urban communities from a socio-ecological theoretical framework, we need to study: (a) social structure and the social allocation of natural and institutional resources; (b) social organizations and their organizational structure, social dynamics, social order, and social resources; (c) community self-reliance, quality of life, cultural values and perception, freedom, empowerment, and
Many scholars have found a connection between social capital and social ecology. Social capital, according to Bourdieu (1986), is considered necessary for community sustainability, a concept closely tied with social ecology. As Coleman (1988) describes, social capital is the relations between individuals and groups. Based on this conceptualization, Roseland (2000, p. 82) makes a direct connection: “It [social capital] can take several forms, some of which are mutually recognized bonds, channels of information, and norms and sanctions. In this sense social capital is related to the concept of social ecology”. The outcomes of social capital include successful consensus building, shared information, reduced conflict, and new collaborative efforts (Innes et al., 1994; Innes & Booher, 1999; Mandarano, 2007), and these are relevant to the social ecology of cities. Social capital supports the equity aspect of social ecology (Light, 2004; Schneider, 2006). Among the five forms of capital (financial, physical, human, cultural, and social), only the property of social capital is generally accessible (Light 2004, p. 148). Light (2004) identifies the “uniquely democratic accessibility” of social capital, contrasting it to other forms of capital. According to Silverman (2004, p. 2), “Social capital is but one form of capital that is needed for community organizing and community building efforts to be successful”.

Social capital is highly relevant in studying disadvantaged inner-city neighborhoods that may or may not have a strong social infrastructure (Ungar, 2011). According to some analysts, in many disadvantaged areas “there can still be sustainable participatory democracy; and (d) environmental, social, and economic justice (for details, see Table 1, p. 21).
(albeit less extravagant) physical capital that provides recreational and social gathering spaces for residents, as well as normative cultures (social capital) that promote collective well-being” (Ungar, 2011, p. 1745). Residents of such neighborhoods may have better access to social capital compared to the other forms of capital (Light, 2004), because social capital ideally provides democratic access to disadvantaged people. In this way, social capital becomes their strongest resource whenever they want to improve their socio-economic conditions (Light, 2004, p. 145). On the other hand, since many inner-city neighborhoods lack social capital and strong social infrastructure in place, urban analysts call for “developing social capital in the worst-off parts of our cities” (Temkin & Rohe, 1998, p. 61).

A collective action event, which is an outcome of social capital, is “highly concentrated geographically and explained by systematic variations in community-level characteristics” (Sampson et al., 2005, p. 679). In the urban setting, social capital usually assesses the following constructs: (i) the level of community engagement, (ii) the characteristics of local social networks, (iii) levels of trust among community members, (iv) effectiveness of community organizational infrastructure, (v) the size, diversity, location, and closeness of ties, and resident use of those ties, and (vi) the number, size, effectiveness, perceived status, and connectedness of community organizations (Rohe, 2004, p. 160-61).

The connection between social capital and social ecology framework can be also explained using organizational theory. Following Coleman’s (1990) ideas about organizational social capital, Roseland (2000, p. 81) writes: “Social capital refers to the
organizations, structures and social relations which people build-up themselves, independently of the state or large corporations. It contributes to stronger community fabric, and, often as a by-product of other activities, builds bonds of information, trust, and inter-personal solidarity”. A social-ecological approach to managing interorganizational relationships was discussed by Emery and Trist (1973). This approach discusses “communities” of organizations, highlights the importance of collective (as opposed to individual) forms of organizational adaptation, and suggests the usefulness of the concept of “collective strategy” (Astley & Fombrun, 1983, p. 578). Following this approach, social capital (i) ensures social relationships and trust which “enable people and institutions to gain access to such resources as social services, jobs, and government contracts” and (ii) makes sure that every individual is given access to resources, trust, and relationships (Schneider, 2006, p. 4-5).

Researchers who have taken an ecological perspective to study a social topic have generally identified varied contextual influences such as community geographic characteristics, socio-economic-political conditions, financial capability and support, and community readiness (Butterfoss et al., 2006; Kegler et al., 2010), as well as the historical relationships among NPOs and among organizational actors in a community (Valente, Chou, & Pentz, 2007; Son & Lin, 2008; Kegler et al., 2010). From the socio-ecological point of view, organizational networks can be formed via informal collaborations among individuals affiliated with different organizations or formal organizational coalitions (Singer & Kegler, 2004). Such coalitions tend to be driven by community issues and grounded in community conditions and social networks (Bess et
al., 2012). To better understand organizational coalition formation and participation, studies should include a “comprehensive social ecology of community organizational actors” (Bess et al., 2012, p. 534).

Community programs driven by NPOs are considered to be culturally appropriate and ecologically congruent with community capacity and norms (Miller & Shinn, 2005; Bediako & Griffith, 2007). Therefore, an effective strategy to build community capacity would be identifying and building the capacity of the key NPOs of that community (Griffith et al., 2010). Capacity building should not be perceived as a ‘project’ with a deadline (Labonte et al., 2002), but as a central component of the community food movement.

Crowea and Smith (2012) examined the relationship between cultural and social capitals and food security/food access in small to mid-sized communities. They presented an argument that “communities who take an asset-building approach to development (i.e. planned efforts to building resources that can be used to reduce or prevent poverty and injustice) are more likely to have the capacity to respond to the need for food security” (Crowea & Smith, 2012, p. 170). The following statement further elaborates their argument.

[C]ommunities with values and beliefs conducive for community betterment (cultural capital) coupled with acting on those beliefs through participation in civic groups and networking with outside communities and organizations (social capital) are much more likely to have a variety of sources of food than communities with low levels of cultural and social capitals. (Crowea & Smith, 2012, p. 169)

Research done by Lancaster and Smith (2010) examined the relationship between human and social capital and organizational resources in addressing food insecurity
problems and building community capacity. They used community gardening projects to understand such relationships. Community gardens can increase community connections, citizen participation, and sense of community, all of which in turn may help to build social capital. Moreover, community gardens encourage community residents to gain access to resources, build relationships, and work together to solve a problem (i.e., reduce neighborhood food insecurity). All of these satisfy Chaskin’s (2001) four elemental characteristics in building community capacity.

My research generally considered all of the foundation elements of capacity building efforts (see Baillie et al., 2008) for food-centric NPOs, but focused more on partnerships and community development. The foundation elements included leadership, resourcing, and intelligence, and five key strategic domains supported by these foundation elements including partnerships, organizational development, project management quality, workforce development, and community development (Baillie et al., 2008). Food-centric NPOs can build community capacity through the protection and development of human capital [i.e., nutritional education, cooking lessons, training, workshops, etc.], social capital [i.e., social events, community bonding, etc.], physical capital [i.e., vacant land remediation, site cleanup, etc.], and natural capital [i.e., orchards and tree plants, sustainable energy education, etc.].

Bookchin (1993) observes that our ecological problems mostly arise from social ones, including economic, ethnic, cultural, and gender conflicts. “[P]resent ecological problems cannot be clearly understood, much less resolved, without resolutely dealing with problems within society” (Bookchin, 1993, p. 437). In a recent article about building
community resilience for youth and families, Ungar (2011, p. 1744) takes an ecological perspective by stating that “[a]pects of a community’s social and physical ecology are more important to the resilience of its members than the qualities of individuals alone”.

Researchers have used a social ecology perspective in discussing community coalitions (Wandersman et al., 1996), an ecological framework for conceptualizing the many food environments and conditions that influence food choices (Story et al., 2008), and a social ecology model to study diets of the urban poor (Companion, 2010). On the ground, NPOs take an ecological approach to combat the issue of food insecurity and vulnerability. For example, Philadelphia’s Urban Nutrition Initiative (UNI) mentions in their web site, “UNI’s ecological approach to nutrition education includes hands-on experiences for students to grow, cook, consume and sell healthy foods” (UNI, 2013).

Most of the theories I have reviewed in this chapter, specifically food justice, community development, and community capacity building, have their origins in the experience of practitioners and can be attributed to the fact that practice preceded theory. As explained in chapters 4 through 7, this work is significantly informed by practitioners on the ground.

Next Chapter

In the next chapter (Chapter 3), I will discuss the study context. Then I will lay out five sets of research questions examined in this study. I will also provide details on the methods that I used, brief overviews of those methods, and rationale for using those methods in addressing my research questions.
CHAPTER 3
STUDY CONTEXT AND METHODOLOGY

I start this chapter by discussing the context of this research, then lay out five sets of research questions and explain the overall research design, methods, tools, and analysis units used in this study. While this chapter provides only a broad overview of the methodology and specific methods chosen to answer each question, the following three chapters will provide such information in greater detail.

Study Context

Post-Industrial US Cities: Policies, Debates, and Food Insecurity

Food insecurity is not a new policy issue, but it has become more severe in many post-industrial US cities in recent decades. Several policy changes as well as societal changes since the 1980s may have accelerated the issue in these cities. Over the last three decades, global forces (i.e., World Bank, International Monetary Fund, etc) have reshaped the local and international patterns of urban development that is primarily based on the capitalist class and low-wage labor. These forces have advocated for less government intervention, fewer social services, more privatization and private-public partnerships, and more international free trade. Other changes included leaner government, deregulation of state control over major industries, assaults on organized labor, reduction of corporate taxes, dismantling of welfare programs, and criminalization of the urban poor (Brenner & Theodore, 2002, p. 350). Many of these policies fall within the larger neoliberal framework and have made a serious impact on the national policies
of both developed and developing countries, altering their funding priorities and eliminating many existing programs following the ideological imperatives of the free market (Gaffikin & Warf, 1993).

President Reagan’s McGill Commission set a very clear national agenda in the 1980s. The Report commented that ‘place-oriented’ urban revitalization or redevelopment programs of post-industrial cities in previous decades had shown very little success (McGill Commission, 1981, p.69). The Commission suggested (i) replacing the pattern of ‘place-oriented’ and ‘spatially sensitive’ national urban policies with ‘people-oriented’ and ‘spatially neutral’ social and economic policies and (ii) assisting inner city residents to follow jobs wherever available but not attempting to steer jobs to areas where those people already lived (McGill Commission, 1981, p. 70). Since then, welfare provisions have been rescaled in the US. For example, President Reagan’s block grant strategy was intended to reduce the size of the federal government, privatize federally-supported services, and impose sharp cuts (Boris & Steuerle, 2006, p. 262). As Purcell (2008) explained, state government responsibility for welfare provisions was outsourced to local governments and local government responsibility was outsourced to non-profits, volunteers, and private organizations. This resulted in insufficient state resources to meet new demands.

Post-industrial US cities were affected by some significant changes in national policy in the final few decades of the last century. Many of these policy strategies were explained in the Report of the US President’s (Reagan) Commission, which stated,

These cities are not dying…. This transformation of older cities from centers of manufacturing and production to centers of services and
consumption will require that their “health” be defined at new, and often lower, levels of population and employment… Cities can no longer be expected to perform alone the traditional role of providing employment for the unskilled, unemployed, poor, and dependent urban underclass … The historical dominance of core central cities will be diminished as certain production, residential, commercial, and cultural functions disperse to places beyond them … the rate of growth in nonurban areas will continue to exceed that in metropolitan areas, and the South and West will grow at rates exceeding those in the North and East. (McGill Commission, 1981, p. 66-67)

From the 1940s through the 1970s, national governments generally followed the Keynesian model and allocated resources to local governments on the basis of need and social entitlements. In contrast, the neoliberal model promoted competitive distribution of such funding. Cities with promising economic profiles were more likely to secure funding, but cities with greater social needs were excluded. More specifically, the Commission said that post-industrial US cities were not dying, they were just transforming, which explained why cities in the South and West grew at rates exceeding those in the North and East (McGill Commission, 1981, p. 66-67). These policies, along with an ongoing trend of rapid suburbanization, encouraged relocation of economic vitality to non-metropolitan or previously rural areas and therefore caused more sprawl and the spatial mismatch of jobs (Adams et al., 2008).

At the same time, globalization was another key phenomenon that affected many post-industrial cities. Major global forces influenced a new type of urban development pattern. Following the national trend, many local industrial jobs were outsourced from post-industrial cities to other US or global cities. The cities that have changed their focus from shipping and manufacturing to finance, services, and high-tech industries have prospered over the past thirty years. Meanwhile, post-industrial cities suffered the most,
as steady manufacturing jobs were outsourced to other parts of the world because of the competitive production costs. This resulted in unemployment and low wages in these cities. The decaying infrastructure started having a negative impact on the quality of life of residents. Households in inner-city neighborhoods have had to struggle to achieve a decent education, find and hold a job, and increase their social networks that could lead to jobs or other opportunities (Dreier et al., 2004, p. 98). Overall, post-industrial cities have experienced the following outcomes: (i) a decrease in population, property values, jobs, quality of education, educational attainment, and community resources, and (ii) an increase in vacant land parcels, blight, crime, concentrated poverty, racial segregation, ghettoization of the poor and minorities, low wage jobs, hunger, and obesity.

In 1996, the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) enacted severe reductions in federal entitlement spending and implemented extremely strict policies concerning welfare eligibility requirements, entitlement time limits, and workfare requirements. The concept of “social service” became privatized and government funding had to be channeled through private/public partnerships or private initiatives. Food became a gift and was no longer considered a right (Poppendieck, 1998; Heynen, 2010).

As we understand, urban decay can be characterized by the development of infrastructure during economic booms, followed up with their abandonment in economic downturns (McClintock, 2011). The two main structural causes for food insecurity in disadvantaged urban environments have been identified as the devaluation of urban capital and institutional racism (Agyeman, 2013). I have discussed the food environment
in such inner-city landscapes in Chapter 2 and will discuss more in Chapters 4 through 7. Disadvantaged or marginalized populations living in such urban neighborhoods become exposed to institutional racism and other inequalities, including food insecurity (Billings & Cabbil, 2011). Due to lack of access to healthy and fresh food, including geographic, economic, and informational access, and due to the lack of nutritional and fitness education, these disadvantaged populations rely on cheap, unhealthy, but calorie-heavy diet and thus face negative health consequences.

Many foundations, public officials and activists often view NPOs as neighborhood assets or community capacity building agents that help identify and combat local problems at the neighborhood scale (Twombly et al., 2000). This is, without any reservation, applicable to NPOs that offer food-related programs, services, and events to address the issues related to poverty and food insecurity. Studying NPOs and their food-related programs is an important step to understand the food environment and the state of food insecurity in disadvantaged urban neighborhoods of post-industrial cities.

Study Location

The City of Philadelphia, which is coterminous with Philadelphia County, was chosen as the location for this research for a number of reasons. Due to changes in national policies, as explained above, Philadelphia became one of the major post-industrial cities where a high percent of jobs were located beyond five miles from their central business districts (Stoll, 2005). Similar to many older metropolitan regions, the decaying infrastructure of the inner city started having a negative impact on the quality of
life of the residents. The rate of suburbanization increased and made it more difficult to channel government investments into these core areas (Adams et al., 2008, p. 32). As a result, Philadelphia has been losing population consistently since the 1950s (US Bureau of Census, 2010). Over decades, the quality of education in Philadelphia’s public schools decreased, which acted as a barrier to better-paying jobs. Federal funding for inner-city redevelopment shrank during the 1980s and caused many CBOs to go out of business (Adams et al., 2008).

As Philadelphia shifted from an industry-oriented economy to a service-oriented one, it started facing numerous issues, including urban vacant lots, blight, and poverty. In 2000, Philadelphia became the region in the nation with the highest rate of “concentrated poverty” (Adams et al., 2008, p. 35). This reality made the life of inner-city residents even more challenging. As Dreier et al. (2004, p. 98) argued, households in many high poverty inner city US neighborhoods had to struggle to achieve decent education, find and hold a job, and increase social networks that could lead to jobs or other opportunities. However, the deteriorating condition in Philadelphia has not been experienced evenly throughout the city. For example, the Center City district has seen a residential and commercial revival since the 1990s, mostly populated by young, educated professionals who want to live and work in urban environments (Adams et al., 2008, p. 26). One in four residents in this city are at risk for hunger, more than double the rates reported at both the national and state levels (Greater Philadelphia Coalition Against Hunger, 2012). These poor and hungry people are usually concentrated in areas characterized by lower median income and a non-White population (Meenar, 2012). In addition, these areas have
experienced the most population loss in the city and are characterized by many vacant land parcels and abandoned buildings.

According to US Census Bureau (2010), Philadelphia has 1.5 million residents, 134 sq-miles of land, and a density of 11,500 persons/sq-mile. About 25% of the city population lives below the poverty level. The city’s per capita income is $21,000 and the median household income is $36,000. The city has 43% Black, 41% White, and 12% Hispanic or Latino, as well as 11.5% foreign-born residents. About 21% of the population speaks a language other than English at home. Many neighborhoods in Philadelphia are well-established enclave communities, while others are ethnically very diverse. Not many neighborhoods can offer foods that are culturally and ethnically appropriate to their residents (Meenar & Hoover, 2012). National studies have identified a number of Philadelphia neighborhoods as food deserts or “low access areas” – areas without full-scale grocery stores or other fresh food access (The Policy Map, 2012; USDA, 2012). These neighborhoods also have higher rates of obesity, diabetes, and other health risks that are in some way associated with diets high in simple carbohydrates, salt, sugar, and fats (Companion, 2010).

On the positive side, Philadelphia is nationally known for some of its urban food initiatives, including a healthy corner store initiative, financial incentives for building new grocery stores in disadvantaged neighborhoods, bringing fresh food from regional farms to the city, and distributing healthy produce to local cupboards (for details, see Chapters 5 through 7). Mark Bittman commented in the New York Times, “Foodwise, among the most progressive cities in the country right now is Philadelphia, where the
alliance of a forward-thinking mayor [and partners] is moving things forward” (Bittman, 2011). Pennsylvania’s 1st congressional district, which includes a number of Philadelphia neighborhoods, experienced an improvement in the national food hardship ranks. While the district was ranked as the 2nd or 4th hungriest a few times, it took the 20th or 27th position in recent years, according to the latest data by FRAC (FRAC, 2013).

Diverse community-based programs, supported by NPOs, mission-driven small businesses, and the city health department, exist within the city, from grassroots agriculture on vacant parcels to large-scale farming programs that distribute food in various neighborhoods. The city has about 700 food cupboards for emergency food distribution (Greater Philadelphia Coalition Against Hunger, 2012). National food hardship surveys from the last couple of years showed improvements in the 1st congressional district, although the district was identified as the second or fourth hungriest in nation for a number of years, with 50% of households with children suffering from hunger (Lubrano, 2011). The city has adopted new zoning codes that recognized urban agriculture as a land use. Regional media interests around local food, healthy eating, and community food security are growing. The Philadelphia region’s nationally recognized Food Systems Plan was created in 2010 with the help of a government organization (Delaware Valley Regional Planning Commission) and a dense network of stakeholders in the metro region. Overall, the co-existence of socio-economic problems and diverse NPO programs and interventions make this city a living laboratory for this research.
The Neighborhood Context

The urban food system, even just two decades ago, was not as visible as other urban systems such as housing, land use, transportation, water resources, development, or decay, because food systems or agriculture were usually considered as rural issues. Pothukuchi and Kaufman (1999) argued that food systems should be placed on the urban agenda, because they contribute significantly to community health, welfare, and economy, and connect to other urban systems. Referring to the scale and context, Kaufman (2004, p. 336) repeated that “food is very much a community issue at all geographic levels”.

Since the early conceptualization of this research study, this was to be a neighborhood-based analysis. A neighborhood is an area of a town or city where residents can engage themselves in the practice of planning their environment (Innes & Booher, 2004) and establishing active citizenships (Brannan et al., 2006). The local context of a neighborhood plays a crucial role in almost every stage of someone’s life – from early childhood to senior years.

While Jacobs (1961) claimed that the traditional neighborhood lost its meaning and function in the modern big cities, Gans (1962) illustrated neighborhoods as places where residents (or “urban villagers” in his terms) preserve their special family life, peer groups, and communal institutions within a modern city. For this reason, we see various different types of neighborhoods that belong to various types of ethnic or other groups in one big city (Suttle, 1972). Neighborhoods have been defined as the consolidation of social and physical spaces that follow not only physical boundaries, but also social
networks, local resources, and special symbolic or emotional connotations (Rappoport, 1977), and thus play a role in residents’ willingness to be involved and improve their neighborhood (Ahlbrandt, 1984). In most inner cities, the poor, ethnic- or racial-minorities, and immigrants tend to cluster geographically and create urban enclave type of neighborhoods, where they can support each other and defend their socio-economic-political goals (Abrahamson, 1996).

The size and geographic boundary of a neighborhood is determined or defined through an unofficial agreement or disagreement among its residents and stakeholders; so it is hard to see universally-accepted boundaries of neighborhoods in almost any city. The City of Philadelphia, like many US cities, has experienced several racial successions. The city has long established neighborhoods of Blacks, White ethnic populations, Latino populations, and Asian refugee populations. I found different versions of ecologically-defined neighborhood boundaries, ranging from 40 (Temple University’s Philadelphia neighborhood project) to 69 (University of Pennsylvania’s Philadelphia Neighborhood Information System) to 149 or even 230 (both from Philadelphia City Planning Commission). Since there was no universally-accepted definition and/or boundary designation for Philadelphia neighborhoods available, I decided to use Philadelphia’s 18 planning district boundaries as geographic units for the display of final analyses. The city is using these boundaries for its planning-related work. Local media (such as PlanPhilly or GRID magazine) have started referring to these district boundaries as neighborhoods.

Table 3 provides an overview of Philadelphia planning districts, their key neighborhoods, and their characteristics, strength, and issues, compiled from the City of
Philadelphia web site. As we see in this table, most planning districts include neighborhoods that are facing poverty, unemployment, blight, residential vacancy, and crime – some of the key issues related to this research topic. There are no references to food, with only two exceptions. Food desert has been stated as an issue in the River Ward district and food distribution is listed as a characteristics/strength of Lower South district, which is mostly non-residential. The state of food security/insecurity in all these planning districts will be examined in Chapter 4.

<table>
<thead>
<tr>
<th>Planning District</th>
<th>Key Neighborhoods</th>
<th>Characteristics and Strengths</th>
<th>Key Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>Northern Liberties, East Poplar, West Poplar, Callowhill, Old City, Chinatown, Society Hill, Washington Square West, Queen Village, Bella Vista, Hawthorne, Francisville, Fairmount, Spring Garden, Logan Square, Rittenhouse Square, and Southwest Center City</td>
<td>Over 300 years of history. Assets are considered backbone for the whole city. Strong civic associations, neighborliness, historic value, and home values</td>
<td>N/A*</td>
</tr>
<tr>
<td>Central Northeast</td>
<td>Fox Chase, Burholme, Rhawnhurst, Lexington, Bells Corner, and the northern portions of Lawndale, Upper Northwood and Castor Gardens</td>
<td>Choices for housing and shopping</td>
<td>Commercial revitalization, redesign of shopping center, transportation safety</td>
</tr>
<tr>
<td>Lower Far Northeast</td>
<td>Winchester, Winchester Park, Ashton, Pennypack Woods, Academy Gardens, Morrell Park, Crestmont Farms, Walton Park, Parkwood, Normandy, Mechanicsville</td>
<td>Modern, family-friendly communities</td>
<td>Walkability, pedestrian safety, traffic calming, complete streets, and the need for small parks</td>
</tr>
<tr>
<td>Planning District</td>
<td>Key Neighborhoods</td>
<td>Characteristics and Strengths</td>
<td>Key Issues</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lower North</td>
<td>North Philadelphia, North Central, Norris Square, Olde Kensington, South Kensington, West Kensington, Yorktown, Ludlow, Brewerytown, Green Hills, Cecil B Moore, Sharswood, Strawberry Mansion</td>
<td>Population in some areas is growing while other areas continue to shrink. Informal solutions to vacancy through gardens, parking, business expansion and keeping livestock</td>
<td>Poverty, blight, vacancy, unemployment, lack of access to jobs, lack of income to support the kind of retail services people want</td>
</tr>
<tr>
<td>Lower Northeast</td>
<td>Frankford, Northwood, Summerdale, Lawncrest, Oxford Circle</td>
<td>Fastest growing district, stable and affordable housing stock, walkable commercial corridors, a number of landmarks and economic drivers</td>
<td>Health insurance, access to health services</td>
</tr>
<tr>
<td>Lower Northwest</td>
<td>East Falls, Wissahickon, Manayunk, Central Roxborough, Upper Roxborough, Andorra, Shawmont Valley</td>
<td>Trendy shopping and dining in Manayunk and East Falls, stable and desirable residential areas</td>
<td>Recreation, environmental protection, and commercial revitalization</td>
</tr>
<tr>
<td>Lower South</td>
<td>N/A*</td>
<td>Largely non-residential, sports complex, Navy Yard, large industrial areas, including port, food distribution, and shipbuilding facilities</td>
<td>Most areas remain an unexplored place with unknown potential, air and ground pollution, a high water table, floodplains, and airport noise</td>
</tr>
<tr>
<td>Lower Southwest</td>
<td>Southwest Philadelphia, Eastwick, Paschall, and Elmwood</td>
<td>Large residential areas, a major industrial district and the Philadelphia International Airport, new immigrant populations from West Africa and Southeast Asia</td>
<td>Vacancy and lower property values, market demand for industrial land, neighborhood stability, and access to the Schuylkill River</td>
</tr>
<tr>
<td>Planning District</td>
<td>Key Neighborhoods</td>
<td>Characteristics and Strengths</td>
<td>Key Issues</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>North</td>
<td>Fairhill, West Fairhill, St. Hugh, Tioga, Allegheny West, Nicetown, Hunting Park, Juniata Park, Harrowgate, Feltonville and a portion of Kensington</td>
<td>Ongoing neighborhood revitalization efforts</td>
<td>Unemployment, poverty, abandonment, drugs, crime, planning for large industrial areas</td>
</tr>
<tr>
<td>North Delaware</td>
<td>Wissinoming, Tacony, Mayfair, Holmesburg, Upper Holmesburg, East Torresdale, and the Delaware riverfront from the old Frankford Creek to the Bucks County border</td>
<td>Dense rowhouses, access to park and riverfront, historic properties in residential and industrial areas</td>
<td>Historic preservation, neighborhood commercial revitalization, and mitigating I-95 reconstruction activities</td>
</tr>
<tr>
<td>River Wards</td>
<td>Fishtown, East Kensington, Olde Richmond, Port Richmond, Kensington, Bridesburg</td>
<td>Dense rowhouses, includes a busy port and large public utility properties</td>
<td>Unemployment, clash between big box retails and traditional commercial corridors, traffic congestion, low car ownership rate, food desert, drug use</td>
</tr>
<tr>
<td>South</td>
<td>South Philadelphia, Grays Ferry, Whitman, Pennsport, Point Breeze</td>
<td>Mostly single-family rowhouses, commercial corridors</td>
<td>Residential vacancy, commercial corridor identity and viability, limited access to open space and riverfronts</td>
</tr>
<tr>
<td>University/Southwest</td>
<td>Powelton Village, University City, Saunders Park, West Powelton, Spruce Hill, Walnut Hill, Garden Court, Cedar Park, West Shore, Kingsessing</td>
<td>Institutions of health and education, strong historic housing fabric</td>
<td>“town &amp; gown” relationships, quality and adequacy of commercial development</td>
</tr>
<tr>
<td>Planning District</td>
<td>Key Neighborhoods</td>
<td>Characteristics and Strengths</td>
<td>Key Issues</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------</td>
<td>------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Upper North</td>
<td>Logan, Olney, Fern Rock, East Oak Lane, West Oak Lane, Cedarbrook, Ogontz, Belfield</td>
<td>N/A*</td>
<td>Vacant sites and properties, historic preservation, Broad St commercial corridor,</td>
</tr>
<tr>
<td>Upper Northwest</td>
<td>Germantown, East Germantown, Blue Bell Hill, West Mount Airy, East Mount Airy, Chestnut Hill</td>
<td>Known for its historic homes, tree-lined streets, and excellent public transportation</td>
<td>Revitalization, historic preservation, commercial corridor improvement</td>
</tr>
<tr>
<td>Upper Far Northeast</td>
<td>Bustleton, Somerton, Byberry, and Industrial Parks on the east and west sides of Roosevelt Blvd</td>
<td>Suburban-like area</td>
<td>Walkability, pedestrian safety and traffic calming, management and upkeep of retail centers and industrial parks</td>
</tr>
<tr>
<td>West</td>
<td>Overbrook, Carroll Park, Haddington, Morris Park, Cobbs Creek, Dunlap, Mill Creek, Belmont, Mantua</td>
<td>Predominantly residential</td>
<td>Vacant homes, vacant lots, underperforming commercial corridors, crime, disinvestment, and a lack of home equity</td>
</tr>
<tr>
<td>West Park</td>
<td>N/A*</td>
<td>Vast parkland, predominantly residential, cultural landmarks</td>
<td>N/A*</td>
</tr>
</tbody>
</table>

*Data Source: City of Philadelphia (2013)*

* Data not available
Methodology Overview

Mixed Methods Research

Mixed method research “provides a tremendous opportunity to create ways of doing research that intersect contested epistemological and methodological differences, and to disrupt persistent efforts to frame different paradigms and modes of inquiry as inherently incompatible” (Elwood, 2009, p. 95). This type of research not only involves collecting and analyzing both quantitative and qualitative data but also increasing the overall strength of a study compared to either qualitative or quantitative research alone (Creswell & Plano Clark, 2007). Creswell (2009, p. 14-15) explained three general strategies of mixed methods research: (i) Sequential (for researchers who seek to elaborate on the findings of one method with another method); (ii) Concurrent (for researchers who converges both types of data in order to provide a comprehensive analysis of the research problem); and (iii) Transformative (for researchers who use an overarching theoretical perspective within a design that contains both types of data).

Johnson et al. (2007) identified a threefold typology capturing the range of mixed methods research designs: QUAN-qual (quantitative informing qualitative), QUAL-quan (qualitative informing quantitative), and pure mixed. Fielding and Cisneros-Puebla (2009, p. 349) argued that “spatially oriented qualitative social science and qualitatively oriented geography are particularly likely to produce ‘pure mixed’ forms of [mixed method research]”. Such pure mix can be simultaneous (with limited interaction between two types of data sources) or sequential (with results from one method positioning the next) (Morse, 1991). Fielding and Cisneros-Puebla (2009, p. 350) argued that “spatially
oriented [mixed method research] is characterized by the sequential type, reflecting the practices involved in work with GIS, which involves constant comparison of different representations of geo-referenced data”.

Quantitative and qualitative methods work as complementary methods in a mixed method research when neither of these methods could offer a complete perspective upon the research question. For example, quantitative analysis of survey data can examine broader structural relationships, but qualitative analysis of interviews may offer new meanings and relationships not made visible through that quantitative analysis (England, 1993; Hanson & Pratt, 2003). Use of multiple data and methods in one study helps to achieve triangulation, which “is a long-standing approach to working with multiple methods or forms of data in the social sciences” (Elwood, 2009, p. 102).

According to Greene (2008, p. 18-19), mixed methods in Qualitative Geography, a recognized sub-discipline of Geography, incorporates “such quantitative forms as graphs, tables and figures; and such qualitative forms as stories, poems and performances; and even such spatial forms as maps and networks”. Although other research areas in Geography have used mixed methods for a long time, it is “significantly more recent in GIS” (Elwood, 2009, p. 95). Integration of GIS and qualitative data analysis software can be done by “presenting data from multiple sources in one display, thereby enabling cross-method comparisons and analyses” (Greene, 2008, p. 15).

*Qualitative GIS*

GIS has been always considered as a tool for analyzing and representing quantitative spatial data; but qualitative GIS initiates the discussions on the integration of
qualitative research and GIS (Cope & Elwood, 2009). Early criticisms about GIS included the following arguments: GIS masks alternative versions of social reality (Marble, 1990); GIS is rooted in positivist epistemologies and is primarily suited for quantitative techniques associated with spatial science (Lake, 1993; Pickles, 1995); GIS imposes a “‘God’s eye view’” and neglects the viewpoints of minorities and the underprivileged (Haraway, 1996); GIS avoids non-cartographic spatial knowledge and thus may cause exclusion and disempowerment (Sheppard, 1995; Harris & Weiner, 1998); and GIS does not allow for multiple perspectives, context, and subjectivity (Kwan, 2002).

Responding to these critiques, commonly known as “GIS & Society” critiques, researchers incorporated several approaches in their methodology, including public participation and participatory GIS, feminist GIS, and Critical GIS, where they followed multiple epistemologies, used multiple data and forms of knowledge, incorporated non-cartographic information, and supported qualitative and quantitative forms of analysis (Cope & Elwood, 2009, p. 1-2). All these propositions paved the path for the qualitative GIS approach, a method that integrates multiple forms of evidence and promotes multiple modes of analysis in order to explain the production and socio-political impact of spatial knowledge, patterns, relationships, and interactions (Cope & Elwood, 2009; Elwood, 2009).

Work under Qualitative GIS (or, GIS and Society and Critical GIS) have introduced (i) new forms of representation and visualization ideas to challenge the fixed nature of spatial data sets and (ii) new directions for analyzing social inequalities and
injustice, influenced by feminist and social theories (Elwood, 2010). Qualitative GIS can be framed by or it has connection to Critical GIS (Pickles, 1995; Schuurman, 2000; Elwood, 2010), Feminist GIS (Kwan, 2002; McLafferty, 2002; Pavlovskaya, 2002; Schuurman & Pratt, 2002; Gilbert & Masucci, 2006), Qualitative Geovisualization (MacEachren, 1994; Cieri, 1996; Crampton, 1999, 2009; Knigge & Cope, 2006; Kwan, 2007; Cosgrove, 2008; Dodge & Perkins, 2008; Kwan & Ding, 2008; Aitken & Craine, 2009), Public Participation GIS or Community GIS (Talen, 1999, 2000; Al-Kodmany, 2000; Craig et al., 2002; Dennis, 2006; Elwood, 2006), and Software Level Blending of GIS and Qualitative Research (Matthews et al., 2005; Kwan & Ding, 2008; Fielding & Cisneros-Puebla, 2009; Jung & Elwood, 2010).

Researchers have interpreted the meaning and applications of Qualitative GIS in many different ways. According to Knigge and Cope (2006), even though GIS maps offer factual representations of space and place, the knowledge we gained from a map is always socially constructed. They took a “grounded visualization” approach, a blend of quantitative GIS and Grounded Theory-based qualitative fieldwork, that revealed “both ‘context’ and ‘content’ in a spatial dimension” (Skinner et al., 2005, p. 230).

Pavlovskaya (2002) took an approach that required transformation of qualitative data where qualitative data informed GIS maps, a process termed as “conversion” techniques by Bazeley (2006). Matthews et al. (2005) created hot link or hyperlink connections that offered basic connection between GIS and qualitative data. Jung (2009) developed an application called Computer-Aided Qualitative GIS (CAQ-GIS) that stored qualitative data directly in GIS. Fielding & Cisneros-Puebla (2009) used community mapping
techniques where community participants collectively, in groups, drew on printed maps showing their social interaction areas, risky areas, etc.

Research Design

For this dissertation, I chose a concurrent mixed methods approach where qualitative and quantitative data can be merged into one large database or the results from each method can be used side by side to reinforce each other (Creswell & Plano Clark, 2007). If I follow Morse’s (1991) definitions, this could be termed as a sequential and pure mix type of mixed method research. Based on Creswell (2009), I collected both forms of data simultaneously and integrated the information for the analysis of different types of questions and a better interpretation of the overall results. For example, qualitative quotes supported statistical results or qualitative comments influenced the weighting factors in a GIS-based raster overlay analysis.

This was a cross-sectional study that included (i) various types of primary data collection methods, including survey, interview, field observation, and content retrieval via the Internet, (ii) secondary data verification using grounded geo-visualization method, and (iii) various types of analysis, including GIS-based spatial and network analysis, statistical analysis, and qualitative assessment. I followed a qualitative GIS approach in a number of analyses.

My research design consisted of both exploratory and explanatory components, but the primary focus was on exploratory/descriptive components. The exploratory phase combined GIS and qualitative methods, and aimed at assessing and measuring the state of (a) place-based food insecurity and vulnerability, and (b) NPO interventions, such as
providing hunger relief, providing healthy and affordable food through alternative food markets and programs, and offering food-based programs and events tied with community capacity building and community development efforts. The explanatory phase incorporated the results into tests of hypotheses about the relationships between variables related to food insecurity and specific NPO interventions.

My overarching exploratory research question was: What is the role of NPOs in addressing community food insecurity and vulnerability within the context of the urban environment? This broader question generated five sets of research questions, which were included in Chapter 1 and repeated in this section. Study goals and specific tasks were derived from those questions. Table 4 offers an overview of these goals, tasks, and specific methods used to complete the tasks.

<table>
<thead>
<tr>
<th>Table 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview of Study Methodology</strong></td>
</tr>
<tr>
<td><strong>Overall Goals</strong></td>
</tr>
<tr>
<td>Understanding of place-based food insecurity and vulnerability</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Overall Goals*</td>
</tr>
<tr>
<td>---------------</td>
</tr>
</tbody>
</table>
| Understanding the dynamics of place-based charity food programs to combat food insecurity and vulnerability | - Develop a RELIEF index to assess and rank Philadelphia’s census tracts and planning districts, based on their levels of convenient access to NPO programs offering hunger relief services  
- Explore whether there is any association or relationship between RELIEF ordinal ranks and the ranks created by the first indicator of the PFIVI index – HUNGER | GIS, field observations (32 food cupboards), interviews (6 NPO representatives), and document reviews                                                                                                               |
| Understanding the ways NPOs address food access issues by providing convenient access to alternative food outlets | Develop an ALTFOOD index to assess and rank Philadelphia’s census tracts and planning districts, based on their levels of convenient access to NPO-driven alternative food outlets  
Explore whether there is any association or relationship between ALTFOOD ordinal ranks and the ranks created by the second indicator of the PFIVI index – LOWACCESS | GIS, interviews (38 NPO representatives), and document reviews                                                                                                                                               |
| Understanding the ways NPOs address food insecurity and vulnerability through food-related programs and events that are tied with their community development and community capacity building efforts | Describe the types of NPOs, their programs and events, their contribution to community development, and their nature of community engagement and capacity building efforts  
Qualitatively assess how NPOs, through their programs and efforts, respond to the overall PFIVI scores | Survey (153 NPOs), interviews (38 NPO representatives), GIS, content retrieval via the Internet, qualitative assessment, descriptive statistics, and field observation                                                                 |
Table 4
(continued)

<table>
<thead>
<tr>
<th>Overall Goals*</th>
<th>Specific Tasks</th>
<th>Methods Used</th>
</tr>
</thead>
</table>
| Understanding the spatial patterns of inter-organizational relationships | - Examine place-based organizational networks that exist among NPOs  
- Calculate place-based network density and assess any relationship with PFIVI scores  
- Visualize place-based bonding and bridging networks among NPOs and assess any relationship with PFIVI scores | GIS, GIS-based spatial network analysis, social network analysis, content retrieval via the Internet, qualitative assessment, and field observation (25 food-related events, tours, forums, and community or stakeholder meetings, organized by NPOs) |

* Goals were driven by the research questions.

Methods: Question Set 1

Using a food justice framework, how do we comprehensively measure community food insecurity and vulnerability at a local level, such as a census tract or a neighborhood? What indicators and variables should we consider and why? How can we create a place-based food insecurity index and apply it at the urban neighborhood level?

I approached these questions with an extensive review of methods used in CFS and Food Geography literature that includes discussions on food access and food deserts. Based on these reviews and following the food justice framework, I developed a *Place-Based Food Insecurity and Vulnerability Index (PFIVI)*. The index used GIS and qualitative methods and incorporated six indicators, associated with a total number of 33 variables. The indicators were HUNGER (poverty and hunger), LOWACCESS (lower access to healthy food), HABIT (poor food habit), HEALTH (poor public health...
condition), ENGAGE (lower community engagement), and RISK (at-risk population and places). The index was created using a GIS model, coupled with six independent sub-models representing six indicators, each of which is explained in Chapter 4. A comprehensive understanding of CFS, the use of mixed-methods GIS, and the addition of “vulnerability” allowed me to include a number of variables in this analysis that would not be otherwise possible. All models were created using ESRI ModelBuilder™ 10.0 and raster overlay analysis techniques. In order to show ordinal ranks of the level of food insecurity at the neighborhood level, I finally simulated the model using the City of Philadelphia as an example. Since a GIS-based framework has been established, other indicators can be added, and additional sub-models can be created for other communities, if needed.

Three types of qualitative methods were used to identify a number of variables and assign their weights in the PFIVI model and six sub-models: (i) document reviews, including scholarly and grey literature and newspaper articles, to identify indicators and variables for the models, (ii) field observations to 26 corner stores in various lower-income neighborhoods in Philadelphia to collect data on the availability and variety of fresh and healthy food, and (iii) interviews with 38 NPO representatives to include their input in variable selection and their weight assignment in the GIS models. Details of all these processes will be discussed in further details in Chapter 4.

*Methods: Question set 2*

What are the dynamics of place-based charity food programs or street-level food assistance programs to combat food insecurity and vulnerability? Do these programs
address the needs of the food insecure or hungry population? Is there any service gap or other operational challenges? Do the NPOs intervene where there are the greatest needs?

To answer these questions, I developed a RELIEF index to assess and rank Philadelphia’s census tracts and planning districts, based on their levels of convenient access to NPO programs offering hunger relief services. Then I conducted statistical tests to measure whether there is any association or relationship between RELIEF ordinal ranks and the ranks created by the first indicator of the PFIVI index – HUNGER. The questions that I ask include: Is there any significant relationship between HUNGER and RELIEF? Is there any association between these two ordinal variables? Can we measure it? Is it a weak or strong, positive or negative association? What is the strength of this association? For the statistical tests, I had the following hypothesis: Higher levels of hunger relief services are prevalent in areas with higher HUNGER scores. It is, however, possible that this hypothesis will be true for most of the areas, but not all. Some areas with higher HUNGER scores may suffer from spatial mismatch issues.

The RELIEF index was created using the same GIS-based methodology as the PFIVI index, described above. The index used three variables: CUPBRD – areas with convenient access to food cupboards and food banks (n = 688), FRESHFD – areas with convenient access to outlets distributing fresh produce (n = 75), and SOUPKIT – areas with convenient access to community kitchens or soup kitchens (n = 47). Qualitative methods used in this analysis included document reviews, field visits to 32 food cupboards, and interviews of the representatives of six NPOs that have citywide hunger relief and related programs. Findings were used to identify the variables and assign their
weights in the RELIEF model. Statistical tests to examine relationships between HUNGER and RELIEF indices included Chi-Square, Gamma, and Spearman's rho tests.

Further details about methodology and specific tools used in this analysis will be discussed in Chapter 5.

*Methods: Question set 3*

How do NPOs address food access issues by providing convenient access to healthy and affordable food through alternative food outlets? Do the NPOs intervene where there are the greatest needs? Is there a common spatial pattern throughout the city?

Following similar methodologies as the previous questions, an ALTFOOD index was developed to address question set 3 and rank Philadelphia’s census tracts and planning districts, based on their levels of convenient access to NPO programs offering healthy and fresh food through alternative food programs. I used six variables to build this index: GARDEN – areas with convenient access to community gardens (n = 368), FARMARK – areas with convenient access to NPO-operated farmers’ markets (n = 47), CSA – areas with convenient access to community-supported-agriculture pick-up locations (n = 48), COOP – areas with convenient access to food co-ops (n = 4), HLTSTOR1 – areas with convenient access to level one healthy corner stores (n = 440), and HLTSTOR2 – areas with convenient access to enhanced healthy corner stores (n = 200).

Qualitative methods, such as document reviews and interviews of the representatives of 32 NPOs that have one or more types of alternative food programs, were used in this GIS-based index. Finally, I ran statistical tests to measure any association or relationship between ALTFOOD ordinal ranks and the ranks created by the
second indicator of the PFIVI index – LOWACCESS (lower or no access to healthy food). I performed three statistical tests – Chi-square, Gamma, and Spearman's rho – to measure these associations or relationships. For the statistical tests, I had the following hypothesis: NPO-driven alternative food movements provide higher levels of services in areas with higher LOWACCESS scores. However, it is possible that some areas with poor access to healthy and fresh food may not be covered by NPO interventions or programs. The qualitative discussions included non-spatial topics, such as program operation, economic contribution, community buy-in and involvement, social exclusion, and government policies that directly or indirectly impact NPO programs.

Methods: Question set 4

How do NPOs address food insecurity and vulnerability through their food-related programs and events that are tied with community development and community capacity building efforts? Do these programs and events respond to the overall PFIVI scores?

The questions were addressed using descriptive statistics and qualitative assessment, based on data from a 28-question online survey of 153 NPO representatives (which yielded a response rate of 79%), interview of 38 NPO representatives, field observations, information retrieval from the Internet, and GIS maps. The discussions were primarily focused on NPO programs and events (food-related educational and training programs, internship and voluntary work programs, and events; participants in programs and events; and access), community economic development (creating or retaining jobs through food-related programs, assisting local businesses, producing food in vacant lands), and community engagement (tools or methods used by NPOs and
frequency of use). This work was built upon an assumption that NPOs initiate community development and capacity building activities more vigorously (with higher levels of services) in areas with higher PFIVI scores. Some areas with lower scores, however, may not have such offerings. Chapter 7 will provide detail description of the methods and tools used in this analysis.

Methods: Question set 5

What is the nature of inter-organizational relationships and networks among NPOs that address community food insecurity and vulnerability? Is there any association between organizational network density and PFIVI scores? Is there any association between bridging/bonding networks and PFIVI scores?

In order to address these questions, I presented an “exploratory” examination of inter-organizational relationships, partnerships, or networks among Philadelphia NPOs that offered food-related programs and events. The analysis was performed under an assumption that areas with higher PFIVI scores generally are targeted by a higher number of NPOs that have a higher organizational network density. Data were collected from my NPO survey and interviews, as well as from online sources, i.e., websites, blogs, and social networking sites. This analysis was, in most part, an exploratory study that used GIS, GIS-based spatial network analysis, social network analysis (i.e., network density, bridging and bonding network, etc.), content retrieval via the Internet, qualitative assessment, and field observation of 25 food-related events, tours, forums, and community or stakeholder meetings, organized by NPOs. Chapter 7 will discuss these
methods in details and also explain the limitations with existing methods available for performing “place-based” social network analysis.

**Unit of Analysis**

I collected data for Philadelphia from various sources and at diverse scales, including census tracts (n=384) and block groups (n=1,336), zip codes (n=47), planning districts (n=18), and neighborhoods (n=40, 69, 149, or 230). In addition, a number of datasets were generated from mailing addresses and were available as points, not boundaries. For GIS-based raster analysis, I used square size raster cells as units of analysis throughout the study area. Raster cells are commonly used units in GIS-based spatial analysis (Fortin & Dale, 2005). I used a cell size of 100 ft X 100 ft, which is small enough to aggregate point data without losing much detail.

However, I needed to transform all the final analysis results in a different unit (i.e., polygon boundaries) before sharing the results with the stakeholders so that the resulting maps become better readable to non-GIS users. I chose to use census tracts and planning district boundaries for this purpose. Both of these boundaries are familiar to NPOs, stakeholders, and policy-makers alike. The census tract is a typical unit of aggregation used in Food Geography (i.e., food desert analysis), although more disaggregated areas, such as the block groups, are also used whenever data are available at that scale (Sparks, et al., 2009). I have discussed the reasons for using planning district boundaries as alternative to neighborhood boundaries earlier in this chapter (see the section on neighborhood context).
Next Chapter

In the next chapter (Chapter 4), I will use food justice theory to analyze and measure food insecurity in disadvantaged urban neighborhoods. Based on an extensive review of methods used in food access/food desert/CFS literature, I will discuss the development of a *Place-Based Food Insecurity and Vulnerability Index (PFIVI)* that used GIS and qualitative methods. Finally, I will discuss the application of PFIVI index in the City of Philadelphia as an example.
CHAPTER 4

A PLACED-BASED FOOD INSECURITY AND VULNERABILITY INDEX

There are three key sections in this chapter. In the first section, I use food justice theory to analyze and measure place-based food insecurity, specifically within the context of lower-income neighborhoods of post-industrial US cities. I also present an extensive review of methods used in food access/food desert/community food insecurity literature and present the gaps. In the following section, I discuss the development of a Place-Based Food Insecurity and Vulnerability Index (PFIVI) that used GIS and qualitative methods and incorporated a series of indicators and variables. Finally, I discuss the application of this index in the City of Philadelphia as an example. The results show ordinal ranks of the level of food insecurity in Philadelphia neighborhoods.

Measuring Food Insecurity – Review of Methods

I start the discussion with four recently published literature reviews or meta-analysis on food access or food deserts, followed up with my own review of methodologies that were used in many recent CFS-related studies. Beaulac et al. (2009) conducted a review of 49 articles that are primary, quantitative, and observational studies showing evidence for the existence of food deserts in socioeconomically-disadvantaged areas in the US and four other “high-income” countries. The inventory included peer-reviewed and grey literature (unpublished or self-published studies or reports) from 1966 through 2007. Using geographic and market-basket approaches, these studies showed
clear evidence for disparities in food access in the US by income and race. The authors found weak evidence for the existence of food deserts in other high-income countries.

The work of Larson et al. (2009) involved a literature review of 54 articles on healthy food access and neighborhood environment. The authors discussed the challenges of using data and GIS-based geocoding process. The majority of studies used cross-sectional designs; a few were longitudinal, multilevel, or intervention studies. Most of these studies, while examining relationships among residential food access, dietary intake, and obesity, have considered neighborhood and individual characteristics such as gender, race and ethnicity, income, education, and physical activity.

Walker et al. (2010) presented a systematic review and categorization of 31 studies on food access or food deserts. They reported that the most frequently-used measures to assess food access are GIS technology (9 articles), food store assessments (8 articles) and surveys (7 articles). In particular, the majority of these studies used business lists/directories and census data, focus groups, food store assessments, food use inventory, GIS technology, interviews, and compilations of measures of perceptions of food access, questionnaires, and surveys.

Treuhaft and Karpyn (2010) compiled a bibliography of 132 studies conducted in the US over the past 20 years, including 61 peer-reviewed and 71 grey literatures, measuring healthy food access in many different ways and at various scales – from national to specific neighborhoods. Key findings from this review are as follows: (i) healthy food access is a challenge for many Americans, particularly those living in lower-income neighborhoods, minority neighborhoods, and rural communities and those who
lack good transportation options to reach full-service grocery stores; (ii) better food access corresponds with healthier eating; (iii) healthy food access is associated with lower risk for obesity and other diet-related chronic diseases; and (iv) healthy food retailers in underserved communities create jobs and help to revitalize neighborhoods.

While valuable, these four literature reviews are primarily based on only one aspect of CFS – healthy food access. These reviews mainly provide the summary of methods and results of the studies, but do not explicitly discuss the methods used by each of these studies. In addition, a number of important articles were published from 2010 to 2012 that were not included in these reviews. As part of this research, I reviewed the methods used in a total of 64 studies that were focused on at least one aspect of CFS that is tied to food justice theory. Articles taking a GIS, statistics, or mixed-methods approach were prioritized in the selection process. I have not included any article that is based on only theoretical discussion, or an argument, opinion, or public policy discussion. Table 5 presents this literature review, organized according to six food justice components that are related to CFS within the context of urban neighborhoods. Most of these studies are peer-reviewed and a few are grey literature. Most are done at a neighborhood scale and some are at the regional, state, or even national scale.

According to my findings, most original research studies have focused on only selected components of food justice – healthy and fresh food access, food-related public health issues, and food habit. In terms of methods, a number of important studies have used only statistical methods and no GIS, although those studies have strong place-based arguments. Not many innovative approaches of qualitative/ mixed-methods GIS have
been applied to food justice research. Most quantitative studies, using GIS and/or statistics, have explored the relationship between food deserts and community health, focusing on the geographical inaccessibility and unavailability of healthy foods in disadvantaged neighborhoods. On the other hand, purely qualitative studies, using surveys, interviews, and observation, have mostly focused on social justice, collective efficacy, and people’s perception about the availability of healthy and ethnically accepted food. Likewise, not many studies have successfully blended these two approaches. Table 5 summarizes the reviews of methods used in recent literature.

Table 5

<table>
<thead>
<tr>
<th>Methods Used in Community Food Insecurity Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Justice Components</strong></td>
</tr>
<tr>
<td>Hunger &amp; Food Hardship</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Healthy Food Access</td>
</tr>
<tr>
<td>Food Habit</td>
</tr>
<tr>
<td>Public Health</td>
</tr>
<tr>
<td>At-Risk Population &amp; Place</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Food Justice Components</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>Healthy Food Access</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Development of a PFIVI

Methods

The development of the *PFIVI* index involved GIS and qualitative methods. The index had six indicators, associated with a total number of 33 variables. The index was created by a GIS model, coupled with six independent sub-models representing six indicators, each of which is explained in the following sections. All models were created using ESRI ModelBuilder™ 10.0 and raster overlay analysis techniques. Once developed, the models were run using data from the City of Philadelphia. The final output of this index provided ordinal ranks of census tracts based on their levels of food insecurity. Since a GIS-based framework has been established, other indicators can be added, and additional sub-models created for other communities, if needed.

Qualitative methods were used to identify a number of variables and assign their weights in the PFIVI model and six sub-models. The three methods used were document reviews, field visits, and brief interviews. (1) Identification of indicators and variables

<table>
<thead>
<tr>
<th>Food Justice Components</th>
<th>Author(s)</th>
<th>Year</th>
<th>Methods Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Engagement</td>
<td>Armstrong</td>
<td>2000</td>
<td>Survey</td>
</tr>
<tr>
<td></td>
<td>Ferris et al.</td>
<td>2001</td>
<td>Survey</td>
</tr>
<tr>
<td></td>
<td>Jacobsen et al.</td>
<td>2009</td>
<td>Focus Group, Participatory Approach</td>
</tr>
<tr>
<td></td>
<td>Macias</td>
<td>2008</td>
<td>Interviews, Observations</td>
</tr>
<tr>
<td></td>
<td>Slocum</td>
<td>2006</td>
<td>Interviews, Content Analysis</td>
</tr>
<tr>
<td></td>
<td>Teig et al.</td>
<td>2009</td>
<td>Interviews</td>
</tr>
<tr>
<td></td>
<td>Travaline &amp; Hunold</td>
<td>2010</td>
<td>Interviews, Participant Observation</td>
</tr>
</tbody>
</table>
were primarily done by document reviews that covered mostly scholarly and some grey literature and newspaper articles. A selected list of documents is listed in Table 5. These documents were categorized according to six food justice components relevant to US inner city neighborhoods. (2) During summer of 2012, a research assistant from Temple University’s Department of Community and Regional Planning visited 26 corner stores in various lower-income neighborhoods in Philadelphia to collect data on the availability and variety of fresh and healthy food. (3) Since many NPOs address hunger and food insecurity problems by providing better access to healthy food and emergency hunger relief, it was important to incorporate their opinions on this topic. I conducted brief interviews of the representatives of 38 NPOs that have any food-related programs in Philadelphia, based on a purposeful sample selected to maximize heterogeneity. These NPOs were located in diverse neighborhoods, with at least two from each of Philadelphia’s 18 planning districts. The interviews were taken from July 2012 to September 2012. Twenty seven interviews were conducted by phone and the rest were in-person. The interviewees were asked to give their opinions on the many variables that were used in this model. In addition, the interviewees commented on the importance or weight of each variable or indicator in determining the state of neighborhood food insecurity.

Selection of Indicators and Variables

The indicators and variables used in this Index, as presented in Table 6, were chosen from the list of six inter-related food justice components identified in the literature review. Environment and Policy were two additional indicators identified
through document reviews, but were not used in this study, as the Index was applied to only one city. Environment and policy related variables should be an important consideration for multi-city studies.

Table 6

<table>
<thead>
<tr>
<th>Place-Based Food Insecurity &amp; Vulnerability Index (PFIVI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
</tr>
<tr>
<td>1. HUNGER (Hunger and Food Hardship)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>2. LOWACCESS (Lower Access to Healthy Food)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>3. HABIT (Poor Food Habit)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>4. HEALTH (Poor Public Health Condition)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Indicators</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>5. ENGAGE (Lower Community Engagement)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>6. RISK (At-Risk Population and Places)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Hunger and Food Hardship (HUNGER)**

The very [first] question to ask is where do hungry people live? Don’t look into [only] ghettos; hunger exists in other places too, maybe in small pockets and may not be reported by government agencies. (An interviewee from South Philadelphia)
Hunger and malnutrition are very likely the most important factors that we consider while measuring the state of food insecurity of any given community. Poverty is the key cause of hunger. People in poverty may occasionally or regularly face hunger and under-nourishment and have poor diets, and thus suffer physical health consequences. The US government administers a complex network of 18 different food assistance programs, aimed at the so-called “working poor” – a social class that has been expanding in US inner cities. Yet, many government programs are not functioning at their full potential and are underutilized. Millions of Americans who are eligible for the food stamp (SNAP) program do not receive its benefits (Burke, 2011). One of the major challenges is to identify people who need assistance and get them enrolled in a suitable program. Besides, many government programs lack socio-economic-political support. Historically, the nation has been divided on who should be assisted by government and who should not. Anti-hunger activists argue that Congress should update government programs’ eligibility requirements and simplify existing rules (Summers, 2006). In addition, both the definitions of poverty and the poverty threshold the government uses to identify the poor have been criticized, as they no longer reflect actual financial needs and resources of lower-income households (Citro & Michael, 1995; Meenar, 2012).

Ever since the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) cut certain administrative costs of government-supported programs, the hunger relief distribution and outreach activities have been primarily administered by nonprofit organizations, although they lack capacity, resources, and better economic support. Charitable feeding projects elicit millions of hours of volunteer time as well as
enormous quantities of donated funds and food (Poppendieck, 2000, p. 191). Many hunger relief and faith-based organizations rely on census poverty and unemployment data to identify food insecure census tracts or block groups. Whenever available, they also collect data of recipients of various government welfare programs, including Supplemental Security Income (SSI), Social Security Disability Insurance (SSDL), Supplemental Nutrition Assistance Program (SNAP), Women, Infant and Children Food Supplement (WIC), and Temporary Assistance for Needy Families (TANF).

The four variables chosen for the HUNGER indicator may come from data created by various sources and at various geographic scales.

- CUTMEAL – Areas with households that had to cut the size of meals or skip meals due to economic reasons
- RELIEF – Areas with population asking for hunger relief from food cupboards
- POVERTY – Areas with population under poverty
- WELFARE – Areas with welfare recipient households (SSI, SSDI, SNAP, WIC, TANF)

Lower Access to Healthy Food (LOWACCESS)

We live in a neighborhood where you’ll see lots of fast food stores or stores with junkies selling high calorie and fatty meals at a cheaper price. You won’t see much healthy [food], if you consider fresh fruits and vegetables as healthy stuff. (An interviewee from Upper North District, Philadelphia)

You may say this is a food desert. Kids won’t travel 2 miles to get a 2 dollar broccoli crown or a kale bunch when they have access to all these cheap and yum burgers and purple drinks. Would you? (An interviewee from River Wards District, Philadelphia)
Many poor and minority urban neighborhoods have insufficient and inconsistent access to healthy foods, causing negative social, health, and environmental effects to neighborhood residents. Specifically, population loss in many post-industrial inner city neighborhoods has also translated to losses in healthy food resources, including full-scale grocery stores and supermarkets. Smaller stores dominate the inner city retail landscape. These stores reportedly have less selection, lower quality, and higher prices than their big-box competitors (Raja et al., 2008), rarely stock fresh fruit and vegetables (Bodor et al., 2008), and primarily sell only processed food, soda, and cigarettes (Nelson et al. 2009). Many researchers use the term food desert to define a geographic area that is primarily seen in lower-income neighborhoods and is characterized by poor access to healthy and affordable food and a heavy concentration of junk food (Beaulac et al., 2009; Gallagher & Rosenfeld, 2010). Limited or no access to supermarkets affects the cost, quality, and availability of fresh food (Algert et al, 2006; Larsen & Gilliland, 2008; Timperio et al, 2008; Powell et al, 2009).

Sometimes there is a gap between people’s perception of healthy food availability and actual geographic access to healthy food. As a literature review suggests, organizations such as the USDA and most communities identify food insecure populations by locating food deserts. One commonly used measure is the distance (or the lack of) to supermarkets, full scale grocery stores, or even corner stores offering limited healthy food choices. Based on this narrative, three variables were chosen for the indicator LOWACCESS.
- **VEGFRUT** – Areas with households that assume there is limited or no access to fresh fruits or vegetables in the neighborhood

- **GROQUAL** – Areas with households that rate poor quality groceries available in the neighborhood

- **OUTLET** – Areas with lower access to supermarkets and grocery stores

  I did not include corner stores or convenience stores as variables for this indicator. Such stores may not sell any healthy food or may not have wide varieties or healthy choices. They may not open for long hours and every day throughout the week, and may not have consistency in terms of product availability. As one interviewee mentioned, “people may go there to buy something, but cannot find it on that particular day”. In most cases, food products in grocery stores are cheaper than corner stores, specialty stores, and alternative food markets. Based on field visits to 26 corner stores, I found that 88% of stores did not offer any healthy food other than milk and occasional bananas or chards, even though some of them were advertising the availability of healthy foods in those stores. Quality and freshness are important factors that might be missing in most of these stores. An interviewee mentioned, “Just look at the quality. If you find Kale and it is almost rotten, will you buy?”

  In addition to these regular stores, some food access studies also consider alternative food outlets such as farm stands, farmers’ markets, and community-supported agriculture. I did not consider alternative food outlets in this PFIVI Index, following the reservations and different opinions posed by most interviewees – “these alternative food outlets should be analyzed separately – not along with typical food outlets”.

95
**Poor Food Habit (HABIT)**

We are not a community of healthy eaters. Many people in our neighborhood don’t have the cultural knowledge around healthy eating habit as they didn’t grow up around fresh food. Many don’t care about diet or nutrition. It’s not only about money [purchasing power for fresh and organic food], you could grow on your own, right? A [healthy food related] project failed in recent times, as there was not much demand. (An interviewee from West District, Philadelphia)

Food habit or food consumption culture at the household level is an important factor for determining food insecurity. Today the US has more single-parent families, fewer stay-at-home parents, and a faster pace of life that encourages consumption of more unhealthy, pre-packaged foods than at any other time in the past. In addition, affordability to purchase fresh, organic food is a major challenge for many lower-income families who stretch their dollars by buying cheaper, high-calorie foods with little or no nutritional value. Availability of other personal and community resources, including nutritional educational opportunities and access to information and technology, is also restricted in these poor, minority neighborhoods. Multi-billion dollar advertising campaigns infiltrate schools and poor neighborhoods, instilling mistaken beliefs about nutrition in communities that lack the resources to counter the deception.

The five variables used for the indicator HABIT were derived from document reviews. Food insecure households include the households that have unhealthy diet consumption due to various reasons, including frequent consumption of soda, sugary drinks, and fast foods; and households that may not have enough knowledge about healthy foods and their positive impacts on the body.
• DIET – Areas with households without daily servings of fruits and vegetables (A serving of a fruit or vegetable is equal to a medium apple, half a cup of peas or half a large banana)

• SODA – Areas with population with frequent soda consumption habit

• DRINK – Areas with population with frequent sugary drink consumption habit

• FOODCHNA – Areas with population who frequently visit fast food restaurants

• MENU – Areas with population who are not calorie conscious while ordering food from restaurants

Poor Public Health Condition (HEALTH)

People in our neighborhood used to jog, walk, [and] bike… not anymore. Can you blame them? Parks and playgrounds have become centers for drug dealing, prostitution, and what not. Even if you see people [sitting] on [park] benches, they are with bags of junkies or blue drinks and sometimes even Facebooking, if they have [access to smart phones]. (An interviewee from North District, Philadelphia)

The US food industry spends billions of dollars yearly to promote highly processed and packaged foods, and at the same time neglects to advertise the benefits of healthy food choices (Nestle, 2007). Understanding the link between food insecurity and health is vital, and one must consider the many sociological, ecological, psychological, and biomedical factors that occur and that are influenced by regional culture (Loring & Gerlach, 2009). In poor inner-city neighborhoods, choices are limited to fast food or packaged food sold at convenience stores, which lack significant nutritional value, causing health issues (Bodor et al., 2008; Freedman & Bell, 2009; Kwate et al., 2009; Larson et al., 2009; Schafft, 2009). Limited or no access to healthy and fresh food affects the dietary quality and health outcomes (Morland & Evenson, 2009; Beydoun & Wang, 2009; 2010; 2011).
Studies indicate that food insecure communities face greater rates of obesity, diabetes, and other health risks among adults and children (Freedman & Bell, 2009; Schafft et al., 2009; Companion, 2010).

Most CFS-related research in the public health literature deals with obesity issues (i.e., Drewnowski & Specter, 2004; Morland et al, 2006; Morland & Evenson, 2009, Ogden, 2009; Beydoun et al., 2010; Black et al., 2010). Causes of obesity can include genetics, inactive lifestyle, and unhealthy eating habits. Studies have shown that the adverse food environment (unavailability and high cost of healthy food) may increase the possibility of people under poverty becoming obese (Cummins & Macintyre, 2006). A certain group of population who are poor may face diet-related health risks (i.e., diabetes, high blood pressure or hypertension), because they rely on a cheap and unhealthy diet, and at the same time do not participate in any physical activities for exercise that lasts for at least 30 minutes, such as walking, basketball, dance, rollerblading, or gardening. Too often, maps of food deserts imply that diet is a supply-side problem. In fact, the best solutions address demand and lifestyle, including exercise like biking and walking. A map, created by Ride South L.A., an organization dealing with bicycles, mobile mapping, and social justice for South Los Angeles, tells a story about how food access can be tied to mobility of all kinds (Ride South L.A., 2013).

The indicator HEALTH is dependent on five variables related to poor health condition or diet related health risks.

- **HSTATUS** – Areas with population with poor health status
- **DIABETES** – Areas with population with diabetes
• HYPERTENS – Areas with population with high blood pressure or hypertension

• OBESITY – Areas with population with obesity

• EXERCISE – Areas with population that do not participate in any physical activities for exercise that lasted for at least 30 minutes, such as walking, basketball, dance, rollerblading, or gardening

Lower Community Engagement (ENGAGE)

Yes, we need government assistance and all, but community involvement is the key to a number of things, if you want to change the condition of your neighborhood. Unfortunately, the involvement doesn’t happen overnight and automatically. All the work we do [community-based food programs], we need direct engagement of the people from our own neighborhood. Without direct support and activism, it won’t work, it never did. (An interviewee from Lower North District, Philadelphia)

Research identifies community engagement as a crucial component of the food security planning process (McCullum et al., 2005; Vasquez, 2007; Jacobsen et al., 2009). It transforms its participants into urban ecological citizens who not only receive agriculture and environmental education but also acquire the political and social skills necessary for effective citizenship and community building (Travaline & Hunold, 2010). For example, urban agriculture, following the concept of food justice, practices bottom-up and multi-actor approach to decision-making (Lang, 1999), enhances food equity and social integration, and provides natural human capital (Macias, 2008). Research has shown that community gardening is a social and democratic process and a tool to achieve community efficacy that connects the gardens, garden participants, and their health (Teig et al., 2009). Community gardens generally have increased social capital, civic
involvement, and empowerment (Armstrong, 2000; Ferris et al, 2001; Smit & Bailkey, 2006; Gittelsohn & Sharma, 2009).

Many interviewees commented that food insecure neighborhoods can improve their conditions if more residents feel like they belong to their own neighborhoods and they become involved in neighborhood improvement or community capacity-building activities. Examples of such activities include revamping vacant lots, growing fruits and vegetables in a community garden, helping neighbors who are in need, becoming members of community organizations that address issues related to food production, distribution, or the broader food systems, initiating community groups such as a food cooperative, and participating in community events and activities such as nutrition awareness or cooking lessons. Four variables were chosen for the indicator ENGAGE.

- PARTICIP – Areas with population that do not participate in local groups or neighborhood organizations
- NEIGHBOR – Areas with population that do not or cannot help their neighbors
- IMPROVE – Areas with population that never worked together to improve the neighborhood
- BELONG – Areas with population that disagreed with the statement: “I feel that I belong and am a part of the neighborhood”

At-Risk Population and Place (RISK)

So many families are struggling. Older people, poor kids, single moms. People having hard time finding good jobs. Go north [Lower and Upper North Philadelphia] and you'll see poor African Americans and Latinos who can't commute, can't find or buy healthy food in their neighborhoods. Low education, no access to information, especially digital information. Go south [South Philadelphia] and you'll see immigrants and refugees
from many parts of the world. They are struggling as well, can't even speak English. Maybe many of these people are not hungry today, but do you know what happens tomorrow? They don't know. (An interviewee from University/Southwest District, Philadelphia)

We've tried so many food projects in the last few years. You won't be able to imagine how much crime we had to deal with. People are fighting over everything, drug dealing is a common scene not only in vacant lots or abandoned buildings, but also in the street intersections. Kids can't enjoy parks, some of them are occupied by prostitutes. It's very hard to initiate a project in a neighborhood that is in such poor shape. (An interviewee from Lower Northeast District, Philadelphia)

The final indicator “At-risk population and place” (RISK) includes people who may not be currently food insecure, but are vulnerable to food insecurity. Specific focus has been given to older adults, minorities, the disabled, and children; people who are the main wage earners of households but are unemployed; people who do not have easy access to transportation to buy and bring food home; people who do not have access to digital information via the Internet; people who have religion-based food restrictions; people who are foreign-born or refugees and may not have access to culturally-appropriate food items; and people with lower educational attainment. Some interviewees mentioned that certain population groups who are poor and live in adverse urban environments can be vulnerable to food insecurity. Disadvantaged neighborhoods, often characterized with higher vacant lands and higher crime incidents, can discourage physical activity, community improvement initiatives, and healthy food production or distribution at the neighborhood level. According to a few interviewees, higher rates of vacant lots in a neighborhood may discourage establishing new food outlets, either supermarkets or grocery stores, because of perceived low population density and low customer count. Overall, 12 variables were chosen for this indicator.
• EMPLOY – Areas with higher unemployment status
• SENIOR – Areas with higher number of older adult population
• CHILD – Areas with higher number of households with kids that have low access to healthy food
• RACE – Areas with higher number of minority (non-White/Caucasian) population
• PRITRAN – Areas with higher number of population without convenient private transportation option
• INTERNET – Areas with higher number of households without Internet access
• EDUC – Areas with higher number of population with low educational attainment
• FOREIGN – Areas with higher number of foreign-born population
• RELIGION – Areas with higher number of population that have religion related food restrictions
• DISABA – Areas with higher percentage of population with disability
• VACANT – Areas with higher percentage of vacant land
• CRIME – Areas with higher number of crime incidents

The variables for this indicator were based on document reviews. Urban development patterns contribute to spatial inequalities that separate communities along racial and class lines. Minority households experience food insecurity and hunger at higher rates than the national average (FRAC, 2011). In addition, as discussed in a previous section, fresh and healthy food is relatively inaccessible in lower-income and minority neighborhoods which usually have a heavy concentration of junk food. Racial
monitory groups have been targeted by chain fast food and beverage marketing groups (Freeman, 2007; Grier & Kumanyika, 2008). Studies show that poor access to supermarkets or full-scale grocery stores is usually more evident in lower-income, inner-city, and predominantly minority neighborhoods (Weinberg, 2000; Zenk et al. 2005, Moore & Diez Roux, 2006; Morland et al., 2002, 2006; Morland & Filomena, 2007; Raja et al., 2008).

Research has widely acknowledged that the trend of poor nutrition and obesity co-exist disproportionately among poor and minority neighborhoods (Pothukuchi & Kaufman, 1999; Borradaille et al., 2009). Studies support the thesis that poverty and class inequality, in addition to race, play a significant role in who becomes obese (Drewnowski & Specter, 2004). A 2006 study found positive association between poverty and childhood obesity (Phipps et al., 2006). The study compared US, Canada, and Norway, which has a higher rate of public spending and lower rates of child poverty. There was a greater extent of obesity for poor than non-poor children in both Canada and US (in higher rate). Another longitudinal study found that girls from food insecure household had greater gains in BMI than girls from food secure households (Jyoti et al., 2005). There is a direct effect of mobility and location on food access and many people in such urban areas do not have easy access to private transportation (Coveney & O’Dwyer, 2009). Limited or no access to healthy food may contribute to health disparities in chronic kidney disease. A study has shown that processed and fast foods may play a role in African Americans making them four times more likely to die from renal disease (Gutiérrez et al., 2010).
The geographic access factor often draws attention away from other types of access to healthy food, such as informational access, economic access, and cultural access. Immigrant or refugee population and minority religious groups with some food restrictions may face difficulties in finding their preferred food items. Availability of other personal and community resources, including educational opportunities, private transportation, and access to information and technology, is also restricted in these poor, minority neighborhoods.

*Other.* I identified two more indicators that could be used in the PFIVI index – Environment and Food Policy. However, since this is a one-city study, environmental- and policy-related impacts would not be different in different neighborhoods. These two indicators will be useful for a multi-city comparison study. The indicators are described below.

*Environment.* The environmental costs of agribusiness and unsustainable food production practices incorporate (i) environmental costs of food transportation (Norberg-Hodge et al., 2002) and farm machinery, such as carbon emissions, (ii) rapid loss of local, family-run farms (Norberg-Hodge et al., 2002; Nestle, 2007), (iii) significant resource depletion including oil and water, soil erosion, desertification due to a lack of biodiversity and habitat loss (McDonald, 2010, p. 154), and (iv) pollution from chemicals and pesticide usage. Research has shown that overusing fertilizers and pesticides, and growing the same type of crop over and over again (i.e., monoculture) for a long period of time can make the soil less fertile and degrade the quality of the crops (Altieri, 2000). From a social ecology point of view, both the ‘alternative’ agrifood movements and
environmental justice efforts situated in lower-income minority communities emphasize the connection between humans and nature (DiChiro, 1995; Taylor, 2000).

*Food policy.* National and local food policies, primarily influenced by food politics, affect the state of community food insecurity. US food companies, through lobbying with government agencies and forging alliances with health professionals, have laws passed that “favor corporate health over human health” (Nestle, 2007). An increasing number of local municipalities are beginning to realize the impact that the current food system – characterized by heavy reliance on chemicals, increased processing of foods, long transportation times, farm subsidies favoring large producers over small ones, and inequitable access to fresh food – is having on local food security, hunger, health, climate protection, and economic development.

The Farm Bill is the primary piece of legislation that determines US food and agriculture policy. Activists across the nation are calling for a comprehensive, health-focused new Farm Bill that should address the goals of hunger and disease reduction, local and family-farm viability, healthy food affordability and accessibility, environmental protection, regional food systems and resilience, sustainable agriculture, and social justice for farmers and farm workers. Many social movements have helped change national and local policies in many sectors, even without support from the food industry. These included (i) restricting food marketing to children, (ii) regulating school food, (iii) eliminating high-calorie drinks from school vending machines, (iv) enabling the use of food stamps and other coupons at farmers markets, and (iv) labeling calories in fast food and other restaurants (Winne, 1998; Nestle, 2007).
Building Model in GIS

The six independent sub-models and the final PFIVI model were built using ESRI ModelBuilder™ 10.0, an application used to build and edit geoprocessing models in ArcGIS software. A model in ArcGIS environment means a workflow that “strings together sequences of geoprocessing tools, feeding the output of one tool into another tool as input” (ArcGIS Resource Center, 2013). Conceptual flow diagram of this process is shown in Figure 1 and details are provided in Table 7.

Sub-models. The 33 variables or datasets identified in the previous section were used as separate input layers in the sub-models. All of these input data layers were either available or processed as polygon shape file format. In order to find locations that are susceptible to some risks (in this case, food insecurity), raster overlay analysis was used to combine the values of all variables or datasets into one. Following raster overlay method, all vector layers were converted into raster layers so that each cell of each layer referenced the same geographic location (ArcGIS Resource Center, 2011). Each raster dataset was then reclassified into three quantiles, with scores ranging from 1 to 3. Each cell of each raster layer thus was given a numeric value. The overlay process combined all the layers to produce an overall rank or value for each cell of the output layer. Since all of the input layers were not equally significant in defining each indicator, a relative importance or weight to each raster layer was assigned to create a final weighted ranking – a process known as weighted overlay or weighted sum raster analysis.

PFIVI model. The resulting raster layers created from those six sub-models were used as input layers for the final PFIVI model. These six layers were also assigned
weights in the PFIVI model, totaling 1, based on their significance in determining place-based food insecurity. The output raster dataset was also reclassified into three quantiles, with scores ranging from 1 to 3: low to high food insecurity.

**Weight assignment.** Assigning weight for each layer used in the sub-models or the final PFIVI model was a critical step. For each model, I qualitatively verified or rationalized the interviewee suggestions with field visits and document reviews before finalizing a weighting factor for each variable. For example, sub-model 1 HUNGER, which represents the indicator “Hunger and Food Hardship”, had four variables: CUTMEAL, RELIEF, POVERTY, and WELFARE (see explanations in Table 6). Following suggestions from the interviewees, CUTMEAL and RELIEF were assigned higher weights than POVERTY and WELFARE, because the first two variables were more directly associated with hunger. Another sub-model LOWACCESS originally had four variables. Based on field visits and interviews, one variable – Corner Store – was not ultimately included in the model, as discussed before. The variable OUTLET was assigned higher rank than the two remaining variables. All variables for sub-models 3, 4, and 5 (HABIT, HEALTH, and ENGAGE) were assigned equal weight, as no single variable was considered more important than others. Final sub-model RISK, representing the indicator “At-Risk Population and Place”, had the most number of variables. The variables EMPLOY, SENIOR, CHILD, RACE, and DISABA were assigned higher weight than the remaining seven variables. In the final model (PFIVI), layers HUNGER, LOWACCESS, and HEALTH were assigned more weight than HABIT, ENGAGE, and RISK. Table 7 provides the weights of all variables in the models.
Figure 1. A conceptual flow diagram of the model.
Application of the Model in Philadelphia

Data and Application

Almost all of the datasets, except three, were available at either US census tract or zip code level. Data for 24 variables were collected from Southeastern Pennsylvania Community Health Survey 2010, a survey done by the Public Health Management Corporation’s (PHMC) Community Health Data Base. This is one of the largest regional health surveys in the country that focuses on the health and well-being of the region’s residents. Approximately 10,000 household representatives in Philadelphia and four neighboring counties were randomly contacted by phone and asked questions about personal health behaviors, eating habits, and other relevant information. Survey responses were available in Excel and SPSS formats. Only 24 types of questions or responses, coded for Philadelphia County, were used in this study. Each survey participant provided his or her zip code number. Responses were aggregated at zip code level, and later joined with GIS data.

Three GIS data layers, available as point locations, were collected from Philabundance, City of Philadelphia’s Office of Property Assessment (OPA), and The Reinvestment Fund (TRF). Four were collected from the USDA and the remaining two from US Census Bureau. The final output of this analysis followed the boundary of census tracts, because Philadelphia’s census boundaries align nicely with the boundaries followed by policy makers, i.e., political districts and planning districts.

I used qualitative GIS technique such as grounded visualization for verifying data for indicator 2 (LOWACCESS – lower access to healthy food). Grounded visualization
uses grounded theory and visualization together to construct an integrated analysis strategy (Knigge & Cope, 2006). A major challenge was to decide on data that would be the most effective for the variable OUTLET (areas with lower access to supermarkets and grocery stores). I initially collected data from three different sources – North American Industry Classification System (NAICS), Standard Industrial Classification (SIC), and The Reinvestment Fund’s (TRF) Policy Map project.

I experienced challenges with the data from NAICS and SIC, as also reported by Larson et al. (2009). The limitations of these datasets were identified during my random field verification process. A number of outlets were not included in the data layers, and sometimes records included in the data were non-existent in the real world. Similarly, data from TRF did not include a number of existing grocery stores in Philadelphia; however, I have found TRF data more useful than the other two sources. My alternative option was to use USDA’s low access data that was already processed at the census tract level. This data reported whether a census tract had access (within 1 mile distance) to healthy food outlets, i.e., supermarkets and large-scale grocery stores. Detail methodology of this USDA data is available from http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx. However, after overlaying this layer on top of Philadelphia land use layer, I found that most of the identified low access areas (or food deserts, according to the USDA) were non-residential areas. Based on these observations, I finally decided to use TRF supermarket and grocery data.
The sources and geographic units of all the secondary data used in this analysis have been listed in Table 7. The table also listed the weight factor of each variable in the sub-models and weight factor of each indicator in the final PFIVI model.

<table>
<thead>
<tr>
<th>Table 7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Details on Data Layers</strong></td>
</tr>
<tr>
<td><strong>Indicators and Weight</strong></td>
</tr>
<tr>
<td>1. HUNGER (0.2)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>2. LOWACCESS (0.2)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>3. HABIT (0.133)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>4. HEALTH (0.2)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Table 7 (continued)

<table>
<thead>
<tr>
<th>Indicators and Weight</th>
<th>Variables for Sub-Models</th>
<th>Weight</th>
<th>Geographic Unit of Data</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. ENGAGE (0.133)</td>
<td>5.1. PARTICIP 0.25</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2. NEIGHBOR 0.25</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.3. IMPROVE 0.25</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.4. BELONG 0.25</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td>6. RISK (0.133)</td>
<td>6.1. EMPLOY 0.1</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.2. SENIOR 0.1</td>
<td>Census tract</td>
<td>USDA, 2013</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3. CHILD 0.1</td>
<td>Census tract</td>
<td>USDA, 2013</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.4. RACE 0.1</td>
<td>Census tract</td>
<td>US Census, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.5. PRITTRAN 0.075</td>
<td>Census tract</td>
<td>USDA, 2013</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.6. INTERNET 0.07</td>
<td>Census tract</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.7. EDUC 0.075</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.8. FOREIGN 0.07</td>
<td>Census tract</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.9. RELIGION 0.07</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.10. DISABA 0.1</td>
<td>Zip code</td>
<td>PHMC, 2010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.11. VACANT 0.07</td>
<td>Point data aggregated to Census tract</td>
<td>OPA, 2012</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.12. CRIME 0.07</td>
<td>Zip code</td>
<td>NIS, 2009</td>
<td></td>
</tr>
</tbody>
</table>

Note: ACS = American Community Survey, US Census
NIS = Neighborhood Information System, University of Pennsylvania
OPA = Office of Property Assessment, City of Philadelphia
PHMC = Public Health Management Corporation, Southeastern PA Community Health Survey
TRF = The Reinvestment Fund
USDA = US Department of Agriculture

**Indicator 1: HUNGER Sub-Model**

1.1. **CUTMEAL.** These data were converted to raster format, with a cell size of 100 ft\(^2\), based on the field that showed the number of people who had to cut a meal due to economic reasons. The raster layer was reclassified into three ordinal ranks – 1, 2, and 3
– representing lower to higher number population count. Natural Breaks (Jenks) method was used for reclassification.

1.2. RELIEF. The original data were available as points showing locations of 3,518 callers who called Philabundance toll-free hotline asking for food assistance during 2009-2010. Philabundance is the biggest food bank in the Philadelphia metro region. The points were joined to census tract (2010) polygons using the “Spatial Join” method in ArcGIS. Total counts of points in each census tract boundary were recorded. The census tract file was converted to raster format based on that count, with a cell size of 100 ft$^2$. The raster layer was reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of population count. Natural Breaks (Jenks) method was used for reclassification.

1.3. POVERTY. From the ACS poverty data, the density of population under 200 percent of poverty in each census tract was calculated. As reported in Meenar (2012), many state governments and hunger relief agencies consider people as poor if they belong to groups experiencing 200 percent or less of federal poverty level. The 100 percent of poverty level is no longer considered as a practical measurement by many communities. The data were then converted to raster format based on that density field, with a cell size of 100 ft$^2$. The raster layer was reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher density of population under poverty. Natural Breaks (Jenks) method was used for reclassification.

1.4. WELFARE. Data on social welfare recipients per zip code were available for five different government programs – SSI, SSDI, SNAP, WIC, and TANF. The numbers
of welfare recipients in each category were combined to get a total count. This includes overlaps, as some individuals or families have subscriptions to multiple programs. Based on the total count in each zip code, data were converted to a raster layer, with a cell size of 100 ft$^2$, and finally reclassified into 3 ordinal ranks – 1, 2, and 3 – representing lower to higher number of welfare recipients. Natural Breaks (Jenks) method was used for reclassification.

Once the four data layers for this sub-model were processed, a raster overlay analysis was done based on the following formula:

$$\text{Weighted Sum} = \text{CUTMEAL} \times 0.3 + \text{RELIEF} \times 0.3 + \text{POVERTY} \times 0.2 + \text{WELFARE} \times 0.2$$

As mentioned in the methods section, the weight factor for each variable was assigned using qualitative methods, including document reviews and interviews. Two variables CUTMEAL and RELIEF were considered more directly associated with the indicator – HUNGER; therefore these two were assigned a higher weight than the other two variables. The resulting layer from this calculation was reclassified to show 3 ordinal ranks – 1, 2, and 3 – representing low to high levels of hunger or food hardship. Natural Breaks (Jenks) method was used for reclassification.

**Indicator 2: LOWACCESS Sub-Model**

2.1. VEGFRUT and 2.2. GROQUAL. Zip code level data were available showing the numbers of households who assumed that they had limited or no access to fresh fruits or vegetables in their neighborhoods (VEGFRUT) and households that rated groceries available in their neighborhoods as being of poor quality (GROQUAL). These data were
converted to raster formats separately, with a cell size of 100 ft\(^2\), based on the fields showing the numbers of households. Both raster layers were then reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher numbers of households who assumed limited or no access to healthy food or had access to poor quality groceries. In both cases, Natural Breaks (Jenks) method was used for reclassification.

2.3. OUTLET. I calculated three categories of distances from the locations of supermarkets and grocery stores. Distance categories were chosen according to their level of convenience. While selecting these categories, I paid particular attention to the at-risk population group that was discussed in the RISK index. A quarter-mile distance, which is commonly considered a reasonable walking distance for a vulnerable population (for example, McMillan, 2007; Bracha et al., 2010; Gordon et al., 2011) and equivalent to approximately five city blocks, was considered the most convenient access. The second category of access was a range from 0.25 to 1 mile. This is consistent with my document reviews, as I found that most studies in dense urban setting considered one mile as a factor in determining accessibility to supermarkets (for example, see Block et al., 2004; Berg & Murdoch, 2008). For the final category, I considered access beyond 1 mile. The three categories were ranked from 1 to 3, representing the most convenient/ walkable access to the least.

The calculation was done using the raster-based Euclidean Distance tool, available under the Spatial Analyst tools of ArcToolbox, an application of ArcGIS. The analysis extent was set to the city boundary. The resulting raster layer, which was created with 100 ft\(^2\) size cells, was reclassified into three categories using the “Reclassify” tool.
Manual method was used for reclassification, with three break values – 1,320 feet or 0.25 mile, 5,280 feet or 1 mile, and the default 57,939 feet (representing the analysis extent).

Finally, the reclassified raster layer was clipped to the shape of the city boundary.

Raster overlay calculation formula for this sub-model:

\[
\text{Weighted Sum} = \text{VEGFRUT} \times 0.33 + \text{GROQUAL} \times 0.33 + \text{OUTLET} \times 0.34
\]

All the variables were weighted equally. The resulting layer from this calculation was reclassified again to show 3 ordinal ranks – 1, 2, and 3 – representing higher to lower access to healthy food. Natural Breaks (Jenks) method was used for reclassification.

*Indicator 3: HABIT Sub-Model*

3.1. *DIET*, 3.2. *SODA*, 3.3. *DRINK*, 3.4. *FOODCHNA*, and 3.5. *MENU*. All these data layers came from the PHMC survey responses, reporting the numbers of people who did not follow a healthy diet (including no daily servings of fruits and vegetables), consumed non-diet soda and sugary drinks one or more times daily, visited fast food restaurants four or more times per week, and were not calorie conscious while choosing a menu in restaurants. These vector layers were converted to raster format, with a cell size of 100 ft\(^2\), based on the fields that showed the number of people whose responses were counted. The raster layers were reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of people in a zip code who had poor food habit. Natural Breaks (Jenks) method was used for reclassification.

Raster overlay calculation formula for this sub-model:

\[
\text{Weighted Sum} = \text{DIET} \times 0.2 + \text{SODA} \times 0.2 + \text{DRINK} \times 0.2 + \text{FOODCHNA} \times 0.2 + \text{MENU} \times 0.2
\]
All variables were assigned equal weight. The resulting layer from this calculation was reclassified to show 3 ordinal ranks – 1, 2, and 3 – representing good to poor food habit. Natural Breaks (Jenks) method was used for reclassification.

Indicator 4: HEALTH Sub-Model

4.1. HSTATUS, 4.2. DIABETES, 4.3. HYPERTENS, 4.4. OBESITY, 4.5. EXERCISE. Data for these five variables were collected from the PHMC survey responses, reporting the numbers of people who did not have an overall good health status, did not do any physical exercise, and suffered from diet-related chronic health issues, i.e., diabetes, hypertension, and obesity. These vector layers were converted to raster format, with a cell size of 100 ft$^2$. These raster layers were then reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of people in a zip code who had poor health conditions. Natural Breaks (Jenks) method was used for reclassification.

Raster overlay calculation formula for this sub-model:

$$\text{Weighted Sum} = \text{HSTATUS} \times 0.2 + \text{DIABETES} \times 0.2 + \text{HYPERTENS} \times 0.2 + \text{OBESITY} \times 0.2 + \text{EXERCISE} \times 0.2$$

All variables were assigned equal weight. The resulting layer was reclassified to show 3 ordinal ranks – 1, 2, and 3 – representing good to poor health condition. Natural Breaks (Jenks) method was used for reclassification.

Indicator 5: ENGAGE Sub-Model

5.1. PARTICIP, 5.2. NEIGHBOR, 5.3. IMPROVE, 5.4. BELONG. Same as for the previous two indicators, datasets for four variables of indicator 5 were available from the
PHMC survey responses, reporting the numbers of people who never participated in local groups or neighborhood organizations, did not or could not help their neighbors, never worked together with neighbors to improve their neighborhoods, and disagreed with the statement: “I feel that I belong and am a part of the neighborhood”. These vector layers were converted to raster format, with a cell size of 100 ft², based on the fields that showed the number of people whose responses were counted. These raster layers were reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of people in a zip code who showed lower community engagement. Natural Breaks (Jenks) method was used for reclassification.

   Raster overlay calculation formula for this sub-model:

   \[
   \text{Weighted Sum} = \text{PARTICIP} \times 0.25 + \text{NEIGHBOR} \times 0.25 + \text{IMPROVE} \times 0.25 + \text{BELONG} \times 0.25
   \]

   Again, all variables were assigned equal weight. The resulting layer was reclassified to show 3 ordinal ranks – 1, 2, and 3 – representing high to low community engagement. Natural Breaks (Jenks) method was used for reclassification.

   \textit{Indicator 6: RISK Sub-Model}

   \textit{6.2. SENIOR and 6.3. CHILD.} These two data layers from the USDA showed low access census tracts for seniors of ages 65+ and children of ages 0-17. Low accessibility was determined as having little or no access to healthy food within half a mile distance for these age groups. Census tracts were given two types of values – “have access” and “have little or no access.” Data were converted to raster format, with a cell size of 100 ft²,
based on these value fields. The output raster layers were reclassified to show two types of ranks – 1 (have access) and 3 (have little or no access).

6.5. PRITRAN. This USDA data layer identified census tracts with low rates of vehicular access to supermarkets and full-scale grocery stores. The data are based on the assumption that vehicle access to supermarkets or full-scale grocery stores is needed because of the bulk of grocery shopping that people typically do at those outlets. Vehicle access is needed more for households with a higher than average number of members. In this scenario, bicycle or other alternative modes of transportation have not been considered. Vehicle access may not be important for shopping at corner stores, because people usually walk to corner stores and buy limited numbers of items. Census tracts were given two types of values – “have access” and “have little or no access.” Data were converted to raster format, with a cell size of 100 ft², based on this value field. The output raster layer was reclassified to show two types of ranks – 1 (have access) and 3 (have little or no access).

6.5. RACE. From the US Census data, the population count for “White alone, Not Hispanic or Latino” category was deducted from the total population count for each tract. Then the data was merged with GIS shape file of 2010 census tract boundaries. The vector layer was converted to a raster, with a cell size of 100 ft², based on this non-White/Caucasian population count. The raster layer was then reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of non-White population. Natural Breaks (Jenks) method was used for reclassification.
6.10. **DISABA.** Datasets for these six variables were available from the PHMC survey responses, reporting the number of household heads who were unemployed, households that did not have access to the Internet, people with lower educational attainment, immigrant populations who came from the Global South, people who were of a religious minority and had specific diet restrictions, and people with disabilities. These vector layers were converted to raster format, with a cell size of 100 ft$^2$, based on the size of population being considered. These raster layers were reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of at-risk population in a zip code. Natural Breaks (Jenks) method was used for reclassification.

6.11. **VACANT.** The original data were available as points showing locations of 45,139 vacant land parcels in Philadelphia. The points were joined to census tract (2010) polygons using the “Spatial Join” method in ArcGIS. Only two points could not be joined as they were placed on top of tract boundary lines. Total counts of points in each census tract boundary were recorded. The census tract file was then converted to raster format based on that count, with a cell size of 100 ft$^2$. The raster layer was reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher number of vacant land parcels. Natural Breaks (Jenks) method was used for reclassification.

6.12. **CRIME.** The data used for this variable were a compilation of three different crime datasets, collected from the NIS database. These were: (i) all serious incidents against persons in 2009 (Robbery and Aggravated Assault), (ii) all serious property incidents in 2009 (Burglary, Theft, and Auto Theft), and (iii) all narcotics arrests in 2009.
Data were aggregated at zip code level and then converted to raster format with a cell size of 100 ft$^2$. The raster layer was reclassified into three ordinal ranks – 1, 2, and 3 – representing lower to higher crime incidents. Natural Breaks (Jenks) method was used for reclassification.

Raster overlay calculation formula for this sub-model:

$$\text{Weighted Sum} = \text{EMPLOY} \times 0.1 + \text{SENIOR} \times 0.1 + \text{CHILD} \times 0.1 + \text{RACE} \times 0.1 + \text{PRITRAN} \times 0.075 + \text{INTERNET} \times 0.07 + \text{EDUC} \times 0.075 + \text{FOREIGN} \times 0.07 + \text{RELIGION} \times 0.07 + \text{DISABA} \times 0.1 + \text{VACANT} \times 0.07 + \text{CRIME} \times 0.07$$

Same as for the other sub-models, weights assigned for all variables were based on document reviews and interviews. The four variables EMPLOY (employment), SENIOR, CHILD, RACE, and DISABA (disability) were assigned higher ranks because of their higher importance. The resulting layer from this calculation was reclassified to show 3 ordinal ranks – 1, 2, and 3 – representing low to high at-risk population and places. Natural Breaks (Jenks) method was used for reclassification.

**PFIVI Model**

Once all the sub-models were processed, the six output raster files were brought to the PFIVI model to do the final analysis. Here is the equation for the final PFIVI model that incorporated six sub-models with assigned weights.

$$\text{Weighted Sum} = \text{HUNGER} \times 0.2 + \text{LOWACCESS} \times 0.2 + \text{HABIT} \times 0.133 + \text{HEALTH} \times 0.2 + \text{ENGAGE} \times 0.133 + \text{RISK} \times 0.133$$

According to document reviews and comments from most interviewees, HUNGER, LOWACCESS, and HEALTH were considered more important than the other three
indicators in determining food insecurity. The final raster scores, calculated from the weighted sum formula, were aggregated twice in order to generate a score for each census tract and then again for each planning district. The zonal statistics algorithm, available as a tool in ArcToolbox under the Spatial Analyst tool set, was used for this purpose. This tool adds up all the raster cells in a census tract (or planning district) and calculates the mean raster score. For census tracts, the scores were reclassified to show three ordinal ranks – 1, 2, and 3 – representing low to high PFIVI scores. Natural Breaks (Jenks) method was used for reclassification. These reclassified scores were considered as the final PFIVI scores for the census tracts. Each of the planning districts was assigned a rank based on its PFIVI score.

Results and Discussions

Figures 2 through 9 display the results of six sub-models and the PFIVI model. Each map shows a place-based ranking of the variable or indicator featured in the map. Philadelphia census tract boundaries are overlaid in each map, except Figure 9, which shows PFIVI ranks of Philadelphia planning districts.

As mentioned earlier in this chapter, many food access studies have focused on only physical or geographic access to healthy food outlets such as supermarkets or grocery stores. However, in this study I have used this as only one of the 33 variables (2.3 OUTLET). According to the map produced for this variable, many disadvantaged neighborhoods in Philadelphia have one-mile access to one or more types of fresh food outlets. However, this finding does not mean that lower-income residents would like to
buy or have the financial ability to buy healthy and fresh food from these supermarkets. In addition, true access depends on a number of factors, such as quality, variety, availability, affordability, and ethnic preference. Healthy food might be available in most parts of the city, but may not be necessarily accessible to everyone living in those disadvantaged neighborhoods. A better understanding of place-based community food insecurity and vulnerability goes beyond the concept of simply having physical access to healthy food outlets. The final PFIVI score map displays different results than the OUTLET score map or the USDA food desert map.

I have also compared the final PFIVI score result with other similar analyses that have analyzed community food access in Philadelphia. For example, the low-access areas identified by The Policy Map, a project of TRF, include many smaller chunks of areas throughout the city that are underserved by full-service supermarkets and have experienced significant grocery retail leakage (TRF, 2012). The City of Philadelphia’s access to healthy food study (City of Philadelphia, 2012) shows similar results that I found from the final map of indicator 2: LOWACCESS. As predicted, the result produced from this PFIVI model shows a higher number of census tracts that may be food insecure and may have population vulnerable to food insecurity, because this Index incorporated a number of variables that were not considered in other studies.

According to the data shown in Figure 8, out of 384 census tracts in Philadelphia, 185 tracts (or 48% of the total) were assigned a high PFIVI score. These are the tracts identified as having a high level of food insecurity and vulnerability. Among the remaining tracts, 134 (35%) were assigned medium PFIVI score and 65 (17%) were
assigned low. Figure 9 shows the boundaries of Philadelphia’s 18 Planning Districts overlaid onto the PFIVI score map. According to this map, the entire North District was ranked as highly food insecure and vulnerable. Most of the other districts had a mixture of ranks, either medium to high PFIVI or low to medium PFIVI. A few districts have areas with all three types of ranks. The following districts had 50% or more area with highest food insecurity and vulnerability ranking: Lower North, Upper North, Lower Northeast, River Wards, West, University/Southwest, and South.

This proposed model will be available in a publicly-accessible website. Other communities can easily download the model, modify if necessary, and run it using their own data layers. The model, however, is not beyond limitations. One data layer I could have considered is the number of fast food stores per census tract. Many poor inner city neighborhoods are not deserts, but known as food swamps with lots of cheap and unhealthy fast food restaurants. In addition, the model was developed to assess only existing conditions; it did not predict food insecurity conditions in the future. It also omitted any variable related to school programs, environmental impact, and food policy for the reasons stated before. The overall methodology used in this study can be extremely time consuming and expensive if detailed and good quality datasets are not available in other communities. Data inconsistency might be another issue, as data would be collected from multiple sources created in multiple years and for various types of geographic boundaries.
Figure 2. HUNGER sub-model result.

Figure 3. LOWACCESS sub-model result.
Figure 4. HABIT sub-model result.

Figure 5. HEALTH sub-model result.
Figure 6. ENGAGE sub-model result.

Figure 7. RISK sub-model results.
Figure 8. PFIVI model result.

Figure 9. PFIVI rankings of Philadelphia planning districts.
Conclusion

Most studies seeking to determine the state of place-based food insecurity have focused on addressing the issues of either hunger/food hardship or having physical or geographic access to healthy food choices. Physical access to food outlets does not ensure consistent fresh food availability, affordability, ethnic or cultural preference, and variety or quality of foods. Analyzing only geographic access to food, only health consequences of unhealthy food, or only cultural acceptance or perception of food access provides only a partial representation of food insecurity. Influenced by food justice theory, this study argues that a comprehensive understanding and assessment of place-based food insecurity should include more indicators than just hunger and geographic food access, incorporate all relevant socio-economic-cultural variables, and should not overlook disadvantaged populations and places that are vulnerable to food insecurity.

In this chapter, I have discussed how food justice theory can be used to analyze place-based food insecurity and vulnerability, specifically within the context of lower-income neighborhoods of post-industrial US cities. In addition to hunger and low food access, the four indicators I have suggested to include in this narrative are poor food habit, poor health condition, lower community engagement, and at-risk population and places. Based on an extensive document review, a series of interviews, and some field visits, I have developed a PFIVI index comprised of a total of 33 variables to measure those six indicators. A mixed-methods GIS was able to incorporate both quantitative and qualitative understanding of the data and variables in order to develop a comprehensive assessment of community food insecurity and vulnerability. Finally, all these indicators
and variables were used to develop a GIS-based model in order to assess the state of PFIVI in a post-industrial city such as Philadelphia.

This analysis was unique in terms of the theoretical and methodological approach. Few studies have used a mixed-methods/qualitative GIS approach to identify community food insecurity in urban neighborhoods using food justice components. A comprehensive understanding of community food insecurity, the use of mixed-methods/qualitative GIS, and the addition of “vulnerability” allowed me to use a number of variables in this analysis that would not be otherwise possible. Understanding the causes of this issue from a broader perspective will help in the design and targeting of appropriate interventions.

Any modifications to the model or the index, if necessary, will not be difficult in a GIS environment. Although in this study the model was applied within the context of Philadelphia, it should be replicable in other cities with minor adjustments in terms of data and qualitative assessments. As long as other communities agree with the suggested comprehensive understanding of the issue, they can adopt the model and modify it with slightly different types of variables or data layers.

Next Three Chapters

In chapters 5, 6, and 7, I will examine the ways NPOs address the issues of food insecurity and vulnerability within the context of urban neighborhoods. These chapters will discuss three types of interventions that NPOs embark on – providing hunger relief (Chapter 5), providing healthy and affordable food through alternative food markets and
programs (Chapter 6), and offering food-based programs and events tied with community
capacity building and community development efforts (Chapter 7).
CHAPTER 5
THE DYNAMICS OF PLACE-BASED CHARITY FOOD PROGRAMS

As discussed in Chapter 4, the urban poor and other vulnerable populations living in many disadvantaged post-industrial inner cities are at risk of having inadequate access to healthy, affordable, and culturally appropriate food. In chapters 5, 6, and 7, I analyze the ways NPOs generally address the issues of community food insecurity and vulnerability within the context of urban neighborhoods. More specifically, these chapters identify and discuss three types of interventions that NPOs embark on – providing hunger relief, providing healthy and affordable food through alternative food markets and programs, and offering food-based programs and events tied with community capacity building and community development efforts. This study was focused on private NPOs with constituencies of varied scales – neighborhood, city, or regional. It included community-based or grassroots organizations (with or without formal 501(c) (3) status), community development corporations, and faith-based institutions that have food-focused programs. Educational institutions and foundations were not included in this study. As in the previous chapter, these analyses and discussions primarily focus on Philadelphia.

This chapter analyzes the first of the three NPO interventions mentioned above – providing hunger relief, which I have termed as RELIEF. The purpose is to discuss the dynamics of place-based charity food programs or street-level food assistance programs. The discussions have references to federal and state programs, but the primary focus is at
the local level. Federal programs are channelized through the States to the local level; and foods are distributed through local NPOs and in some cases public institutions like schools. The goal of this analysis is to examine whether the charity food programs or street-level food assistance programs are addressing the needs of the food insecure or hungry population and whether there is any service gap or other operational challenges. Do the NPOs intervene where there are the greatest needs? Is there a common pattern throughout the city?

To answer these questions, I develop a RELIEF index to assess and rank Philadelphia’s census tracts and planning districts, based on their levels of convenient access to NPO programs offering hunger relief services. Then I run statistical tests to measure whether there is any association or relationship between RELIEF ordinal ranks and the ranks created by the first indicator of the PFIVI index – HUNGER (Hunger and Food Hardship), developed in Chapter 4. The questions that I ask include: Is there any significant relationship between HUNGER and RELIEF? Is there any association between these two ordinal variables? Can we measure it? Is it a weak or strong, positive or negative association? What is the strength of this association? For the statistical tests, I have the following hypothesis: Higher levels of hunger relief services are prevalent in areas with higher HUNGER scores. It is, however, possible that this hypothesis will be true for most areas, but not all. Some areas with higher HUNGER scores may suffer from spatial mismatch issues.
Hunger Relief Services

In response to food insecurity, the US government offers a series of “food and nutrition” related programs known as Domestic Nutrition Assistance Programs (DNAPs) to lower-income citizens. Many of these programs have been criticized for their inadequacy and inefficiency, which is explained in a recent report by the International Human Rights Clinic (IHRC).

DNAPs fail to adequately address the needs of the 50 million Americans who live in food insecure households. First, eligibility requirements may be drawn too narrowly, thereby excluding many food insecure individuals from receiving benefits. Second, eligible participants face numerous administrative barriers to participation, such as complicated application and renewal processes. And third, the benefits provided through DNAPs may not be sufficient to meet participants’ food related needs. (IHRC, 2013, p. 3)

Such limitations in government programs have made many individuals turn to specific types of NPOs – a network of charitable emergency food providers, such as food banks, food cupboards, and soup kitchens (IHRC, 2013). These providers were originally intended to be short-term emergency services, but have become routine sources of food for many lower-income households (Feeding America, 2011). The NPOs, along with government and for-profit organizations, have recognized the multi-layered or complex issues of poverty, hunger, and food insecurity by offering various policies, programs, and initiatives related to hunger relief or other nutrition improvement services. In particular, these NPOs play a crucial role in redistributing many government programs and services. The NPOs, which act as a connector between government programs and the people in need of food assistance, may be represented by nutrition educators, advocacy groups, anti-hunger networking groups, and charitable food providers who have active voices in
(re)shaping public food policy. Although government provides critical support to hunger relief agencies, the contributions are limited and do not necessarily respond fully to the needs.

The relationship or workflow between the government and NPOs can be explained with two examples. The USDA program – Emergency Food Assistance Program (TEFAP) – donates commodity foods to state agencies. Items include canned fruits and vegetables, meat, and fruit juice, which the state agencies distribute to local hunger relief agencies (IHRC, 2013). The amount of TEFAP food, however, may vary significantly in quantity and variety (Feeding America, 2011). Local hunger relief agencies cannot make up for the shortcomings of government nutrition assistance programs and may become extremely limited in their ability to provide nutritious and adequate food to the needy population (IHRC, 2013).

Another example is the State Food Purchase Program (SFPP), which provides cash grants to the lead hunger relief organization (defined as a type “A” agency, or a food bank) in each county to purchase food in bulk. A food bank is connected with a network of agencies (type “B” agencies or food cupboards). Through these smaller agencies, the foods purchased in bulk are then distributed to the county residents who are at or below 150 percent of federal poverty level.\(^1\)

The City of Philadelphia has a number of large, type “A” NPOs [my classification] that are fighting against hunger, including Greater Philadelphia Coalition Against Hunger, Metropolitan Area Neighborhood Nutrition Alliance (MANNA),

---

\(^1\) Interview with Bill Clark, President and Executive Director, Philabundance, 2011.
Philabundance, and SHARE Food Program. These NPOs serve as food distributors, assist people in enrolling in government-supported programs, engage in research, or act as advocates for policy changes. These NPOs constantly search for new donors and meet with government organizations as well as elected officials for financial assistance, very often in competition with one another. The city currently has about 700 small or type “B” NPOs [my classification] such as food cupboards and soup kitchens to serve people in need, as long as the agencies are open and have enough food in their storage. Besides these agencies, the city has a complex network of organizations (i.e., federal, state, city, health, community, academic, agriculture, and private foundation) that offer various relevant programs and initiatives.

Here, I use Philabundance as an example to demonstrate the work of NPOs in detail. Philabundance is one of the leading hunger relief organizations in the Philadelphia metro region. It handles the federal Commodity Supplemental Food Program (CSFP) for Philadelphia, Bucks, and Delaware counties. The organization distributed 17 million pounds of food in 2009, secured primarily through food drives and donations from wholesalers, retailers, food brokers, food distributors, and others in the food industry, and then purchased complimentary or missing food products at discounted bulk rates. It solicits and receives financial and voluntary contributions from individuals, corporations, businesses, foundations, and religious and civic groups. Philabundance generally serves 65,000 to 75,000 households per week, which is about 10% of the potentially needy. An example of food distribution in different catchment zones in 2006 (the latest data

_____________________

ii Interview with Bill Clark, President and Executive Director, Philabundance, 2011.
available) is provided in Table 8. In that year, 92% of the foods that were delivered were food donations, four percent purchased, and only four percent government commodities. Figure 10 shows these catchment zone boundaries.

Table 8

<table>
<thead>
<tr>
<th>Philabundance Catchment Zone</th>
<th>Target Population</th>
<th>Total Food Distribution (in lbs)</th>
<th>Total Food Distribution / Week (in lbs)</th>
<th>Total People Served Weekly (5 lbs each)</th>
<th>Number of Cupboards/Catchment Zone*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegheny</td>
<td>23,683</td>
<td>300,698</td>
<td>5,783</td>
<td>1,157</td>
<td>17</td>
</tr>
<tr>
<td>Center City</td>
<td>15,972</td>
<td>441,546</td>
<td>8,491</td>
<td>1,698</td>
<td>20</td>
</tr>
<tr>
<td>Eastwick</td>
<td>28,371</td>
<td>436,984</td>
<td>8,404</td>
<td>1,681</td>
<td>10</td>
</tr>
<tr>
<td>Far Northeast</td>
<td>27,897</td>
<td>69,755</td>
<td>1,341</td>
<td>268</td>
<td>5</td>
</tr>
<tr>
<td>Fox Chase</td>
<td>22,125</td>
<td>74,196</td>
<td>1,427</td>
<td>285</td>
<td>3</td>
</tr>
<tr>
<td>Hunting Park</td>
<td>38,457</td>
<td>412,939</td>
<td>7,941</td>
<td>1,588</td>
<td>18</td>
</tr>
<tr>
<td>Kensington</td>
<td>22,238</td>
<td>115,834</td>
<td>2,228</td>
<td>446</td>
<td>20</td>
</tr>
<tr>
<td>Kingsessing</td>
<td>26,884</td>
<td>738,990</td>
<td>14,211</td>
<td>2,842</td>
<td>8</td>
</tr>
<tr>
<td>Logan</td>
<td>33,470</td>
<td>466,895</td>
<td>8,979</td>
<td>1,796</td>
<td>17</td>
</tr>
<tr>
<td>Lower Northeast</td>
<td>29,968</td>
<td>142,807</td>
<td>2,746</td>
<td>549</td>
<td>8</td>
</tr>
<tr>
<td>Lower South</td>
<td>27,604</td>
<td>55,803</td>
<td>1,073</td>
<td>215</td>
<td>4</td>
</tr>
<tr>
<td>North Central</td>
<td>31,834</td>
<td>992,176</td>
<td>19,080</td>
<td>3,816</td>
<td>32</td>
</tr>
<tr>
<td>Northwest</td>
<td>32,248</td>
<td>758,736</td>
<td>14,591</td>
<td>2,918</td>
<td>27</td>
</tr>
<tr>
<td>Richmond</td>
<td>28,090</td>
<td>108,009</td>
<td>2,077</td>
<td>415</td>
<td>7</td>
</tr>
<tr>
<td>University</td>
<td>17,723</td>
<td>285,336</td>
<td>5,487</td>
<td>1,097</td>
<td>14</td>
</tr>
<tr>
<td>Upper South</td>
<td>27,219</td>
<td>300,832</td>
<td>5,785</td>
<td>1,157</td>
<td>13</td>
</tr>
<tr>
<td>West</td>
<td>27,670</td>
<td>504,433</td>
<td>9,700</td>
<td>1,940</td>
<td>15</td>
</tr>
</tbody>
</table>

* A total of 238 cupboards were active and affiliated with Philabundance in 2006.
Philabundance’s food distribution almost entirely depends on a volunteer workforce and it needs outside help with operating costs and additional food to distribute (Philabundance, 2010). The organization has a network of about 500 smaller agencies, including food cupboards, ‘Fresh For All’ trucks, shelter/residential programs, social service agencies, emergency kitchens, and neighborhood distribution programs. About 99% of cupboards are “box” cupboards (boxes with fixed contents given out – one box per family) and the rest are “choice” cupboards (people select items to put into their boxes). Seven cupboards are directly managed by this organization and are sited in fixed and stable buildings. There are 42 neighborhood distribution sites with a high volume of food, similar to farmers’ markets with many perishable items. Under the Fresh For All
program, a truck carrying fresh produce returns on the same day and time each week to 11 locations, which range from a place shared by an area organization to a parking lot. This program usually distributes 8 pounds of food per person per pickup.

Another leading NPO, the SHARE Food Program (SHARE) follows a different model. SHARE has a Food Package program where people can exchange volunteer time for the opportunity to buy affordable food (i.e., meats, fresh fruits and vegetables and grocery items). SHARE packages are never donated, government surplus, or salvage, but purchased from growers, brokers, and packaging plants. For each package of food purchased, the customers need to commit for two hours of “good deed” time, whether at SHARE or other institutions, or in their own neighborhoods (SHARE, 2013).

As discussed in Meenar and Hoover (2012), food cupboards sometimes have informal partnerships with urban agriculture (UA) projects, as UA participants often donate their harvests to these cupboards. Philadelphia’s major hunger relief organizations, including Philabundance and SHARE Food Program, have specific programs that distribute fresh produce to lower-income residents. The City Harvest program of the Pennsylvania Horticulture Society (PHS) has a network of 33 cupboards that receive donations of fresh produce, grown in 44 local community gardens. According to the latest available data, this program reached out to 1,000 lower-income families, and between 2006 and 2009 it distributed more than 64,000 pounds of produce during the regular growing season (PHS, 2013). However, field visits to several food cupboards in 2011 revealed that the availability of fresh produce in these cupboards was not always guaranteed (Meenar & Hoover, 2012).
The RELIEF Index

Selection of Variables

The RELIEF index incorporated hunger relief programs that distributed food canned or fresh, raw or cooked. The variables chosen in this analysis were based on three distinct types of hunger relief services or programs in Philadelphia. They were (i) CUPBRD (areas with convenient access to food cupboards and food banks); (ii) FRESHFD (areas with convenient access to outlets distributing fresh produce); and (iii) SOUPKIT (areas with convenient access to community kitchens or soup kitchens).

Data and Methodology

The development of the RELIEF index involved GIS and qualitative methods. The index was created by a GIS model using ESRI ModelBuilder™ 10.0 and raster overlay analysis techniques. Once developed, the model was run using data from the City of Philadelphia. The final output of this index provided ordinal ranks of census tracts based on their levels of hunger relief services. Since a GIS-based model has been established, other variables can be added for similar study in other communities.

Qualitative methods such as document reviews, field visits, and interviews were used to identify the variables and assign their weights in the RELIEF model. Identification of variables was primarily done by reviews of grey literature and newspaper articles. During the summer of 2010 to the spring of 2012, I visited 32 food cupboards in Philadelphia to collect data on the availability and variety of fresh and healthy food. In addition, I conducted interviews of the representatives of six NPOs that have citywide hunger relief and related programs. These were among the 38 overall
interviews mentioned in Chapter 4. Four interviews were conducted by phone and two were in-person. The interviewees were asked to give their opinions on the variables that were used in this model. In addition, the interviewees commented on the importance or weight of each variable in determining the state of hunger relief services in Philadelphia.

GIS data for three variables were created as point shapefiles. These data showed locations of typical food cupboards (CUPBRD, n = 688), cupboards and other outlets that distribute fresh produce (FRESHFD, n = 75), and soup kitchens (SOUPKIT, n = 47). The sources and geographic units of all the data used in this analysis have been listed in Table 9.

<table>
<thead>
<tr>
<th>Data</th>
<th>Data Type</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUPBRD</td>
<td>Point</td>
<td>Philabundance, 2011, and GPCAH, 2011</td>
</tr>
<tr>
<td>SOUPKIT</td>
<td>Point</td>
<td>Philabundance, 2010</td>
</tr>
<tr>
<td>Census Tract</td>
<td>Polygon</td>
<td>U.S. Census Bureau, 2010</td>
</tr>
<tr>
<td>Poverty</td>
<td>Polygon</td>
<td>ACS, 2005-2009</td>
</tr>
<tr>
<td>Street</td>
<td>Line</td>
<td>ESRI, 2010</td>
</tr>
</tbody>
</table>

*Note.* ACS = American Community Survey, US Census  
         ESRI = Environmental Systems Research Institute  
         GPCAH = Greater Philadelphia Coalition Against Hunger  
         PHS = Pennsylvania Horticulture Society

Original location data were available as address tables and needed to be geocoded, which required addresses to be matched with the street data. Geocoding was done using ArcGIS desktop software. The coordinate system used was the North American Datum (NAD) 1983 StatePlane Pennsylvania South, US feet. Each street feature is divided into segments that have the address range of that segment, such as the beginning and ending addresses. The Geocoding address matching tool also has
tolerances for spelling and numbering conventions. Originally, 692 food cupboard addresses were compiled in the attribute table, 669 of which were matched with a score from 80 to 100 and 16 were matched with a score below 80. The 16 matched addresses with low scores were due to either incomplete/incorrect addresses or multiple candidates for the same address. Among the remaining seven unmatched addresses, four were missing actual address information (i.e., P.O. Box numbers); one was out of Philadelphia (7109 Lianfair Rd); and two needed to be manually drawn (100 N 63rd St and 121 N board St). All the addresses from the other two data layers (FRESHFD and SOUPKIT) were successfully geocoded.

For each of the three variables, I calculated three categories of distances from the service locations. Distance categories were chosen according to their level of convenience. While selecting these categories, I paid particular attention to the at-risk population group that was discussed in the RISK index in Chapter 4. A quarter-mile distance, which is commonly considered a reasonable walking distance for a vulnerable population (for example, McMillan, 2007; Bracha et al., 2010; Gordon et al., 2011) and equivalent to approximately five city blocks, was considered the most convenient access. The second category of access was a range from 0.25 to 1 mile and the final category considered access beyond 1 mile. The three categories were ranked from 3 to 1, representing the most convenient/walkable access to the least.

The calculation was done using the raster-based Euclidean Distance tool, available under the Spatial Analyst tools of ArcToolbox, an application of ArcGIS. I started with the CUPBRD variable. The analysis extent was set to the city boundary. The
resulting raster layer, which was created with 100 ft\(^2\) size cells, was reclassified into three categories using the “Reclassify” tool. Manual method was used for reclassification, with three break values – 1,320 feet or 0.25 mile, 5,280 feet or 1 mile, and the default 57,939 feet (representing the analysis extent). Finally, the reclassified raster layer was clipped to the shape of the city boundary. Similar processes were done for the other two variables and finally three raster files were created, all categorized with three ranks.

As mentioned earlier, the weight factor for each variable was assigned using qualitative methods, including document reviews, field visits, and interviews. FRESHFD was assigned a higher weight (0.5), because the outlets associated with this variable offered fresh fruits and vegetables, even if irregularly or inconsistently. The higher weight was due to higher nutritional value of the food distributed at these outlets. CUPBRD was assigned a lower weight (0.3) due to various reasons. Field visits to 32 cupboards revealed that 11 cupboards were closed, even though those cupboards were listed as open at that time. Five cupboards had extremely limited inventory with only a few canned foods and no other food choices. Only one regular cupboard had some over-ripened tomatoes, donated by a nearby community garden a week before. A 2011 survey, conducted by the Greater Philadelphia Coalition Against Hunger, revealed that 42% of the food cupboards were unable to provide fresh produce to their clients (Greater Philadelphia Coalition Against Hunger, 2012). Finally, SOUPKIT was assigned the lowest weight (0.2), because these outlets attracted a limited group of people who could visit the facilities only at a specific time. All the weight factors equaled to 1.
Once the three data layers for the RELIEF model were processed and weight factors were finalized, a raster overlay analysis was done based on the following formula:

\[ \text{Weighted Sum} = \text{CUPBRD} \times 0.3 + \text{FRESHFD} \times 0.5 + \text{SOUPKIT} \times 0.2 \]

The final raster scores, calculated from the weighted sum formula, were aggregated twice in order to generate a score for each census tract and then again for each planning district. The zonal statistics algorithm, available as a tool in ArcToolbox under the Spatial Analyst tool set, was used for this purpose. This tool adds up all the raster cells in a census tract and calculates the mean raster score. The scores were reclassified to show three ordinal ranks – 1, 2, and 3 – representing low to high access to hunger relief services. These reclassified scores were considered as the final RELIEF scores for the census tracts or planning districts.

**Results**

Figure 11 displays the results of the RELIEF index. The map shows rankings of Philadelphia census tracts, based on the level of convenient accessibility to hunger relief services provided by Philadelphia NPOs such as food banks, cupboards, and soup kitchens. Overall, 127 census tracts (about 33% of the total) had high accessibility to hunger relief services, 77 tracts (20%) had medium, and the remaining 180 (47%) had low accessibility.
Figure 11. RELIEF scores in census tracts. The map is showing low to high level of hunger relief services in Philadelphia census tracts.

Figure 12 displays the rankings of Philadelphia planning districts, based on the level of convenient accessibility to hunger relief services provided by Philadelphia NPOs. As seen in this map, four districts – Lower North, University/Southwest, West, and Central – had high access scores. Lower Far Northeast and Lower South districts secured lowest scores.
Figure 1.2. RELIEF scores of Philadelphia’s planning districts. This map shows low to high level of hunger relief services in a range of lighter to darker shades of color.

Statistical Tests – HUNGER and RELIEF

Once I calculated ordinal scores for each census tract and each planning district, I performed three statistical tests – Chi-square, Gamma, and Spearman's rho – to measure the associations or relationships between RELIEF and HUNGER in three different ways. The Chi-square test was done for census tracts by using a high number of samples (N = 384). The Gamma test was also done for the census tracts, because the three types of ranks (high, medium, and low) assigned for census tracts followed the characteristics of a “collapsed” ordinal variable. I tested Spearman's rho for planning districts, as the sample
size was low (N = 18) and the rankings followed the characteristics of “continuous” ordinal variable.

Table 10 displays observed and expected frequencies and results of the Chi-Square test of these two variables. I analyzed the scores available for all of the 384 census tracts of Philadelphia (N=384). As shown in the table, RELIEF was strongly associated with HUNGER ($X^2 = 40.684, df = 4, p < 0.00$). According to the Chi Square test for independence, the test statistic fell into the critical region and, therefore, I rejected the null hypothesis of independence.

The value of Gamma ($G$) was 0.312. This means there was a positive relationship between two variables HUNGER and RELIEF, but the strength of the relationship was moderate. According to the Gamma test for significance, $Z$ (obtained) value was 2.558, which was higher than $Z$ (critical) value, ±1.96. Therefore, I rejected the null hypothesis.

Finally, I computed Spearman's rho to measure an index of the strength of association between two variables RELIEF and HUNGER. I performed this test for all the planning districts in Philadelphia (N=18). As shown in Table 11, $r_s$ value was 0.64, so there was a positive and direct correlation between two variables. This was a moderately strong correlation, significant at 0.01 level. According to the Spearman's rho test for significance, $t$ (critical) was ±2.120, but $t$ (obtained) was 3.33, so the null hypothesis was rejected.

The reasons for getting “moderately” strong relationship or correlation between HUNGER and RELIEF might be because of the differences in the rank orders in a number of planning districts. For example, most of the census tracts inside Central
district had lower HUNGER scores, but higher RELIEF scores. On the other hand, most of the census tracts inside North district had higher HUNGER scores, but medium RELIEF scores.

Table 10

<table>
<thead>
<tr>
<th></th>
<th>HUNGER (X)</th>
<th>RELIEF (Y)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>89</td>
<td>32</td>
<td>6</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>29</td>
<td>27</td>
<td>21</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>75</td>
<td>80</td>
<td>25</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>193</td>
<td>139</td>
<td>52</td>
<td>384</td>
<td></td>
</tr>
</tbody>
</table>

**Chi-Square and Gamma Tests – HUNGER and RELIEF**

p = 0.000000031247, p < 0.00, $\chi^2$ (obtained) = 40.684

Chi Square test for independence

Sampling distribution = $\chi^2$ distribution, Alpha = 0.001

Degrees of Freedom = 4 (3x 3 Table = (3-1)*(3-1) = 4)

$\chi^2$ (critical) = 18.465, $\chi^2$ (obtained) = 40.684, null hypothesis rejected.

Gamma ($G$) = 0.312

Testing Gamma for Significance

Z (obtained) = 2.558

Sampling distribution = z distribution, Alpha = 0.05

Z (critical) = ±1.96, null hypothesis rejected.
### Table 11

**Computing Spearman's rho – HUNGER and RELIEF**

<table>
<thead>
<tr>
<th>District Name</th>
<th>HUNGER (X)</th>
<th>RELIEF (Y)</th>
<th>D</th>
<th>D²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>3.5</td>
<td>15.5</td>
<td>-12</td>
<td>144</td>
</tr>
<tr>
<td>Central Northeast</td>
<td>5.5</td>
<td>3.5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Lower Far Northeast</td>
<td>6</td>
<td>1.5</td>
<td>4.5</td>
<td>20.25</td>
</tr>
<tr>
<td>Lower North</td>
<td>15</td>
<td>17.5</td>
<td>4.5</td>
<td>20.25</td>
</tr>
<tr>
<td>Lower Northeast</td>
<td>17</td>
<td>12</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Lower Northwest</td>
<td>5.5</td>
<td>5.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lower South</td>
<td>2</td>
<td>1.5</td>
<td>0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>Lower Southwest</td>
<td>8</td>
<td>3.5</td>
<td>4.5</td>
<td>20.25</td>
</tr>
<tr>
<td>North</td>
<td>18</td>
<td>13.5</td>
<td>4.5</td>
<td>20.25</td>
</tr>
<tr>
<td>North Delaware</td>
<td>11.5</td>
<td>7.5</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>River Wards</td>
<td>11.5</td>
<td>9</td>
<td>2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>South</td>
<td>11</td>
<td>13.5</td>
<td>-2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>University/Southwest</td>
<td>15</td>
<td>17.5</td>
<td>-2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>Upper Far Northeast</td>
<td>3</td>
<td>5.5</td>
<td>-2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>Upper North</td>
<td>13</td>
<td>10.5</td>
<td>2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>Upper Northwest</td>
<td>3</td>
<td>10.5</td>
<td>-7.5</td>
<td>56.25</td>
</tr>
<tr>
<td>West</td>
<td>15</td>
<td>15.5</td>
<td>-0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>West Park</td>
<td>7.5</td>
<td>7.5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

\[
r_s = 1 - 6 \left( \frac{\sum D^2}{N(N^2 - 1)} \right) = 0.64
\]

Testing Spearman RHO for significance:
Sampling distribution = t distribution
Alpha = 0.05, Degrees of freedom = N – 2 = 18-2 = 16
\[
t (\text{critical}) = \pm 2.120, t (\text{obtained}) = 3.33, \text{null hypothesis rejected.}
\]

---

**Challenges Faced by the NPOs**

I have already mentioned above about the nutritional issues related to the food items distributed through food cupboards. Emergency food providers donate or sell food for a minimum charge, but they mostly distribute canned food with a few options for fresh protein and vegetables. In order to address this issue, many UA programs in Philadelphia have made partnerships with a number of food cupboards for fresh food...
donations. But the availability of fresh produce in these cupboards was not always guaranteed even during the height of the production season (Meenar & Hoover, 2012).

There are other limitations and challenges associated with hunger relief operations. The food items available at or distributed through these cupboards were not always consistent with the needs of the surrounding areas. The average yearly distribution varied from 80 pounds per person to only 2 pounds per person (Meenar, 2012). According to a 2011 survey done by the Greater Philadelphia Coalition Against Hunger, nearly half (42%) of the cupboards and soup kitchens did not have enough food, either canned or fresh, to meet demand in 2010. About 19% of these agencies turned people away because they did not have enough food to give them. About 42% cut back on the amount they distributed per client. Sixty percent of the coordinators, in charge of cupboards and soup kitchens, had to spend their own personal money on the programs, either “sometimes,” “often,” or “always” (Greater Philadelphia Coalition Against Hunger, 2012).

Although Philadelphia has about 700 hunger relief agencies or street-level food assistance programs, a map published in Meenar (2012) shows that the spatial distribution of these programs is not always consistent with poverty density and the demand for such services. According to the map showing the spatial relationships of their convenient service areas (a quarter-mile network buffer) and poverty density, about 42 percent of people under poverty do not have easy access to these services. There is also an issue with coordination, as shown in Meenar, 2012. In many areas with medium-level poverty, two or more food cupboards are located right next to each other and open for
services at the same time. On the other hand, some areas with high-level poverty may not have any hunger relief agencies within convenient distance. Sometimes multiple food cupboards are located close to each other, but may not offer services in coordination. For example, multiple cupboards might be open at the same time on some days, but no service is available on the other days. Meenar (2012) discussed this issue as a spatial mismatch and lack of coordination issue among street-level food assistance programs.

Due to poor operating conditions many hunger relief agencies are in desperate need of improvement and expansion of their infrastructure, but they cannot address this issue or expand their services due to the cost associated with it. The government keeps track of services only at the county level and do not require establishing any equity in terms of the distribution of relief at the neighborhood level. As a result, spatial distribution of emergency food services may have become disproportionate to underlying need. Table 8 showed that Center City cupboards were among the topmost food distribution facilities in the city. It is unknown whether or how the affluent Center City neighborhood in Philadelphia may receive more help than neighborhoods with much higher levels of poverty and hunger (Meenar, 2012). There is an on-the-ground assumption that there might be a higher number of homeless shelters in this area and they need more coverage from local food cupboards; but this assumption needs to be explored further.

Access to information is another challenge. There is no central database which could inform the NPOs about the need of hunger relief services, the type of services each

---

iii Interview with Bill Clark, President and Executive Director, Philabundance, 2011.
agency is providing, and the service recipients’ locations and frequency of visits. Poverty data are available from the US Census, national household surveys, and other programs, but not at the block group level, which is critical for analyzing hunger relief distribution and creating outreach plans by the NPOs (Meenar, 2012). The street-level agencies cannot determine the number of people in their vicinity needing emergency food assistance, nor can they conduct expensive independent surveys.

Another challenge faced by many food cupboards, which are run by volunteers, is to maintain reliable records of their daily operations. Cases where data are available cannot be shared among other agencies, as they are not digitized. Without a client tracking system, it is difficult to calculate the total amount of food distributed through a cupboard and the numbers of people or families receiving any type of assistance in a given year or the frequency of their visits.

During my interviews with NPO representatives, a number of barriers or setbacks were identified, including the competency, capacity, and accessibility of hunger relief agencies that have been discussed above. The following two quotes captured some of the limitations of these agencies:

Regarding access, people in need worry about the reliability & dependability of cupboards at each location … the times sites are open vary … if people are not given a choice, they will travel long distances, if given a choice, they will go to the nearest site. (An interviewee from Upper North District, Philadelphia)

If we consider infrastructure, competency, and commitment, many food cupboards do not have the ability to provide requisite services to the population they serve. (An interviewee from West District, Philadelphia)
During my conversations with the NPO representatives, broader discussions related to hunger relief, SNAP benefits, and the Farm Bill came up. For decades, US Farm Bills have had two major pieces: offering subsidies to farmers and offering nutritional aid (i.e., SNAP) to poor Americans. Over the years, however, farm subsidies have allegedly become a fraud-ridden program that mainly benefits corporations and wealthy individuals. A significant portion of agricultural subsidies do not go to actual farming, but crop insurances, as well as in the form of fueling our cheap, unhealthy food supply (Simon, 2012).

Meanwhile food stamps became a crucial part of the social safety net. The debates surrounding SNAP benefits also include corporations. As discussed in a report by Simon (2012), it is the corporations or big retail chains (such as Coca-Cola, Kraft, Walmart) and banks (such as JP Morgan Chase) that profit the most from SNAP, not the individual who gets $120 a month of SNAP benefits. Since Congress does not require data collection on specific SNAP product purchases (such as Coke or Tropicana), more transparency is needed to understand the flow of SNAP spending, which was about $78 billion in 2011. In 2013, House Republicans voted to maintain farm subsidies at a higher level than either the Senate or the White House proposed, while completely eliminating food stamps from the bill. It is a common understanding among food justice activists that instead of cutting SNAP benefits and hurting poor families, Congress should require food assistance program improvements so that the programs could actually provide a safety net for farmers (including small farmers) and households facing food hardship.
A few interviewees also mentioned the debate associated with the nutritional quality of food that people usually buy using SNAP benefits.

As a hunger relief activist, my main goal is nutrition cultivation. No one should expect that SNAP benefits will provide all the food, as it is a “supplemental” nutrition assistance program. Recipients [of SNAP benefits] shouldn’t purchase all sorts of colored and sugary drinks, zebra cakes, or other junkies with [SNAP] cards, because those won’t give them a single ounce of nutrition. Kids shouldn’t complain if they are trained properly and know what is expected from them … either at home, in school, or out in the neighborhood. (An interviewee from West District, Philadelphia)

Conclusion

In this chapter, I have discussed place-based interventions of NPOs that were targeted toward population facing poverty, food insecurity, and hunger. As we have seen, due to limitations in government programs many individuals seek emergency food assistance from a specific type of NPO – a network of street-level food assistance programs, including food banks, food cupboards, and soup kitchens. Through the development of a RELIEF index, Philadelphia census tracts and planning districts were ranked based on their convenient access to NPO programs offering hunger relief services. About 47% census tracts had low accessibility to hunger relief services, 20% had medium, and the remaining 33% had high accessibility. In terms of planning districts, Lower North, University/Southwest districts, West, and Central districts scored higher ranks because of their higher access to hunger relief services.

I performed three statistical tests to explore the relationships or associations between RELIEF scores developed in this chapter and HUNGER scores developed in chapter 4. The Chi-square and Gamma tests were run for Philadelphia’s 384 census
tracts. According to the Chi-square test, RELIEF was strongly associated with HUNGER, but the gamma test showed a positive but moderate relationship between the two variables. Finally, I computed Spearman's rho to measure the strength of association between RELIEF and HUNGER for Philadelphia’s 18 planning districts. The results showed a positive, direct correlation between two variables, but it was a moderately strong correlation. This result was a reflection of the differences in the rank orders in a number of planning districts. For example, the Central district census tracts mostly had lower HUNGER scores but higher RELIEF scores, whereas the North district census tracts had higher HUNGER scores but medium RELIEF scores.

Based on the discussions in this chapter, it can be said that, generally, NPO programs are located in areas with higher food insecurity and hunger. However, there are high-poverty areas in Philadelphia that are not easily accessible to any hunger relief agencies. Some neighborhoods have more spatial mismatch issues than the others. This mismatch issue, however, is not the only issue NPOs face. Although these NPOs have become the most cost-effective ways of distributing hunger relief, they need more capacity, resources, and better economic support. They need better inter-agency cooperation and coordination in order to improve the level of efficiency of their services.

Next Chapter

In the next chapter (Chapter 6), I will discuss how NPOs provide convenient access to alternative food outlets, including community gardens, farmers’ markets, and community-supported agriculture (CSA) to provide fresh and healthy food in lower-
access areas. By developing an ALTFOOD index, I will assess and rank Philadelphia’s census tracts and planning districts based on this work. Again, I will run statistical tests to explore if there is any association or relationship between ALTFOOD ranks and the ranks created by the second indicator of the PFIVI index – LOWACCESS (Lower access to healthy food).
CHAPTER 6

ALTERNATIVE FOOD PROGRAMS AND NPOS

This chapter analyzes the second of the three NPO interventions mentioned in the beginning of Chapter 5, i.e., providing healthy and affordable food through alternative food programs, which I have termed as ALTFOOD. The overall purpose of this chapter is to examine how NPOs address food access issues by providing convenient access to alternative food outlets, i.e., community gardens, farmers’ markets, community-supported agriculture (CSA), food co-operatives (co-ops), and healthy corner stores. Initially, I ask the following spatial questions: Do the NPOs intervene where there are the greatest needs? Is there a common spatial pattern throughout the city?

To answer these questions, I develop an ALTFOOD index to assess and rank Philadelphia’s census tracts and planning districts, based on their levels of convenient access to NPO programs offering healthy and fresh food through alternative food programs. Then I run statistical tests to measure any association or relationship between ALTFOOD ordinal ranks and the ranks created by the second indicator of the PFIVI index – LOWACCESS (lower or no access to healthy food), developed in Chapter 4. The tests answer the following questions: Is there any significant relationship between ALTFOOD and LOWACCESS? Is there any association between these two ordinal variables? Can we measure it? Is it a weak or strong, positive or negative association? What is the strength of this association? For the statistical tests, I have the following hypothesis: NPO-driven alternative food movements provide higher levels of services in
areas with higher LOWACCESS scores. However, it is possible that some areas with poor access to healthy and fresh food may not be covered by NPO interventions or programs. Finally, based on literature reviews and NPO interviews conducted in 2012, I discuss few key issues and challenges faced by these NPOs. The discussion includes non-spatial topics, including program operation, economic contribution, community buy-in and involvement, social exclusion, and government policies that directly or indirectly impact NPO programs.

Alternative Food Movement/ Community Food Movement

Food justice theory, as discussed in Chapter 2 (literature review), scrutinizes power, resource control, and lack of participation within a food system, and takes position against the hegemonic agro-food industry by calling for alternative solutions such as local agriculture, farmers’ markets, and community-supported agriculture (Macias, 2008; Allen, 2010). The alternative food movement, also known as community food movement, plays out as a creation of local food campaigns, a promotion of food access, a concern for sustainable food production and public health, a focus on economic development based in a regional food economy, and a concern for race, ethnicity, class, and gender issues associated with the power structure of food systems (Gottleib & Joshi, 2010).

Sustainably- or organically-grown food, local food, and affordable food – three aspects of the alternative food movement – do not necessarily co-exist all the time. To address such concerns, initiatives have been taken to combine these ideas by offering
specific programs targeted toward lower-income customers. Many alternative food outlets (i.e., farmers’ markets and CSAs) accept Supplemental Nutrition Assistance Program (SNAP) benefits for payment. Many cities or even states have their own promotional programs as well. For example, Philly Food Bucks is a joint initiative of the Philadelphia’s Department of Public Health (PDPH) and The Food Trust, an NPO. These “bucks” are coupons that help lower-income customers save money on fruits and vegetables. If a customer spends $5 at any of the 25 participating farmers' markets, s/he will be provided a buck that can be redeemed for $2 worth of fruits and vegetables at the next visit (Food Fit Philly, 2013). These Philly Food Bucks can be distributed through community-based NPOs. Among other examples, New York City’s program offers Health Bucks (Grow NYC, 2012), Seattle’s program is known as Fresh Bucks (Neighborhood Farmers Market Alliance, 2012), and Michigan state’s program is called Double Up Food Bucks (Double Up Food Bucks, 2012).

A publication of the American Planning Association, *A Planners Guide to Community and Regional Food Planning*, provided four examples of programmatic efforts related to food systems planning (Raja et al., 2008). The first three examples – community gardens (and farms), farmers’ markets, and CSAs – have been included in this analysis. The fourth example, farm-to-school programs, is out of the scope of this research. I have added two other types of alternative food outlets in this analysis: food cooperatives and healthy corner stores. Of course, small businesses and local governments are affiliated with these types of programs, but my intention is to discuss
these programs if there are partnerships with NPOs. Here, I briefly discuss these five programs.

*Community gardens.* A community garden, as defined by the American Community Gardens Association (ACGA), is a piece of land that is used by a group of individuals for the purpose of growing produce, flowers, or community itself (ACGA, 2010). During the 1893-1897 depression, urban gardening was initiated as an alternative to charity for unemployed workers and their families (Lawson, 2005). Since then, a nearly continuous chain of urban community garden efforts can be traced throughout many US cities. There are approximately 5,000 community garden programs throughout the United States (ACGA, 2010). Community gardens in post-industrial cities have become a symbol of local reaction to two consequences of inner-city decline: urban blight and food deserts. Yet, they are more than that. Many communities rely on these gardens as a mode to achieve not only food security and sustainability, but also community resilience, vacant land remediation, and neighborhood development.

Community gardens are an important part of the UA movement. Significant research has been done on the many benefits of UA that go beyond food access or food security (Irazabal & Punja, 2009). Some researchers have analyzed the impacts of UA and urban greening programs on neighborhood property values (Been & Voicu, 2006), quality of life (Tranel & Handlin, 2006), and crime (Kuo & Sullivan, 2001). Others have studied community gardening as a social process (Teig et al., 2009).
Generally, gardeners take the produce grown and harvested in a community garden to supplement dietary or income needs. Successful gardens can provide great financial savings for lower-income participants. A study conducted by the Philadelphia Urban Gardening Project found that community gardens reported an annual savings of $700 per family (Brown & Carter, 2003, p.13). Another research study estimated that Philadelphia’s community and squatter gardens produced $4.9 million worth of vegetables during the summer of 2008 alone (Vitiello & Nairn, 2009). However, there are many gardens, such as The Hope Garden in Philadelphia, where produce is grown specifically for distribution by hunger relief organizations.

While valuable, these projects have been historically treated as a temporary and informal land use. Naturally, land use and tenure conflicts often cause the early demise of many gardens. Philadelphia has close to 400 community gardens and urban farms, a sharp decrease from 1,000 plus projects reported in the 1970s and 80s, but a steady increase from slightly more than 225 projects reported in 2008 (Vitiello & Nairn, 2009).

_Farmers’ markets._ Farmers’ markets are “recurrent markets at fixed locations where farm products are sold by farmers themselves” (Brown, 2001). These markets may be considered the “keystones” for rebuilding local food systems (Gillespie et al., 2007). There were 7,864 farmers markets listed in USDA’s National Farmers Market Directory in August 2012. This number has more than quadrupled since 1994, the first year of records with only 1,755 markets nationwide (USDA, 2013). Many markets participate in food assistance programs such as SNAP, WIC and Farmers Market Nutrition Program (FMNP). Although most markets are outdoors and seasonal, running from May to
October, there are markets that are open during the winter season. According to a 2009 survey, estimated average annual sales at farmers markets were slightly over $1 billion nationwide and $50,000 in Philadelphia, my study area (USDA, 2009).

More than 60 farmers’ markets operated in Philadelphia in 2012. Most of the markets were managed either by The Food Trust, which is an NPO, or Farm to City, which is a mission-driven small business, both of which are dedicated to increasing healthy foods (PDPH, 2013). The rest of the markets, over 15 of them, ran independently. Most of the markets were seasonal (May to October) and opened once a week. The only indoor farmers’ market was open six days a week throughout the whole year. Six outdoor markets were open year-round and five markets were operational two-three days per week (PDPH, 2013). My study was focused on 47 markets in Philadelphia that were operated by NPOs.

Various efforts of the PDPH have helped increase SNAP redemption at Philadelphia’s farmers’ markets by three times from 2010 to 2012 (PDPH, 2012). In 2010, the PDPH brought together government, community-based organizations, academia, and the private sector by launching Get Healthy Philly, a public health initiative. In partnership with The Food Trust, Get Healthy Philly opened 10 new farmers’ markets in lower-income neighborhoods and launched the Philly Food Bucks program in 2010. Through this initiative, more than 60,000 Philly Food Bucks were distributed from July 2010 to March 2012 at farmers’ markets, recreation centers, WIC offices, food cupboards, churches, community groups, and local events (PDPH, 2012). A survey of 286 shoppers at the 10 new markets in lower-income neighborhoods revealed
three important findings (PDPH, 2012). According to 81% of the survey participants, the prices at the farmers’ markets were the same or less expensive than prices in other neighborhood food stores; 58% of participants reported eating more fruits & vegetables since visiting the market; and 57% of shoppers walked or biked to a market.

**CSA.** Once viewed primarily as rural enterprises, CSAs are increasing in numbers in urban areas. “[CSA] is a marketing strategy where consumers buy ‘shares’ in the farm before planting begins and receive a portion of whatever is available each week of the growing season” (Brown & Miller, 2008). Typically the share consists of a box, bag, or basket of vegetables of different varieties, but other farm products such as milk and meat may be included. No nationwide official count of CSA farms is available, as there is no such government database, but the LocalHarvest website has a comprehensive directory of more than 4,000 CSA farms. This is a significant increase since 1990 when only 50 CSA farms were estimated. Since 2008, the number of CSAs is increasing at an even faster rate (Local Harvest, 2013). Research has shown that CSA participation can increase healthier eating habits, as the participants eat fresher and a greater number and variety of vegetables (Perez et al., 2003; Ostrom 2007). Studies have also shown that generally CSA produce is of higher quality than supermarket produce and therefore worth more (Conner, 2003), and local organic retail values of CSA produce can be 1.5 to 2.5 times the values of CSA shares (Cooley & Lass, 1998).

There were about 10 NPO-operated CSA programs with about 50 pickup locations in Philadelphia during the 2012 season. Some CSAs are connected to rural farms. For example, Lancaster Farm Fresh CSA is connected to Lancaster Farm Fresh
Co-op, a nonprofit farmer's cooperative representing over 70 family farms in Lancaster County, PA. Some CSAs are connected to only urban farms. For example, in 2012 the Enterprise Center CDC launched the Neighborhood Foods CSA program, a partnership between two west Philadelphia urban farms – Walnut Hill Community Farm and Urban Tree Connection’s central farm site in the Haddington neighborhood (The Enterprise Center, 2013). Some CSA programs accept up to a specific number of shares. For example, Greensgrow CSA caps at 400 shares. The costs of Philadelphia CSAs vary from $27 to $33 per week (full share) for 8 to 12 items. Farm to Families is a unique new low-cost CSA program, resulting from a collaborative initiative by the New Kensington CDC, St. Christopher’s Hospital Foundation for Children, the SHARE Food Bank, The Food Trust, Sustainable 19125, and the Common Market (St. Christopher’s Hospital Foundation for Children, 2013). This program does not have any fixed membership fee for the season, but charges $10 – $15 for boxes with 8 to 11 items. Orders can be made a week prior to the desired pick-up date. The Teens for Goods CSA was also $15 per box during the 2012 season, but like other CSAs the total membership fee was due at the beginning of the season.

Food co-operatives. Food co-ops are member-owned local grocery stores, built around democratic processes. Instead of benefiting a corporation, the co-op earnings stay local. Co-ops partner with other community-based organizations, such as urban farms, and local businesses. Anyone can shop at a co-op grocery store regardless of membership, but members receive a discount on groceries. Members can also sign up for “work-shifts” and receive a larger discount. Co-op members are not only owners, but also
active participants in the management and governance of the organization (Mariposa Food Co-op, 2013). According to the Food Co-op Initiative website, there are 325 existing co-ops nationwide and 300 in various stages of development, each of which has hundreds or even thousands of members. Many of these programs generate revenues in the millions of dollars (Food Co-op Initiative, 2013). Philadelphia has three food co-ops that own a total of four grocery stores. A few new co-ops are in development.

Healthy corner stores. Generally, corner stores or small convenience stores are considered as unhealthy food vendors. Based on literature reviews (Borradaile et al., 2009; D’Angelo et al., 2011; Farley et al., 2012; Martin et al., 2012) and local analysis, a recent study titled Walkable Access to Healthy Food in Philadelphia, 2010-2012, has pointed out some limitations of corner stores: “a) customer purchases in corner stores, to a greater degree than in supermarkets and mid-sized food stores, are for unhealthy items, b) the ratio of unhealthy to healthy foods is higher in corner stores than in other retailers, and c) the quality of produce is highly variable in corner stores” (PDPH, 2013, p. 55). As reported in Chapter 4, field visits to 26 random corner stores in Philadelphia by a research assistant found that 88% of stores did not offer any healthy food other than some dairy products and limited quantity of “not so fresh” fruits or vegetables, even though some of them were advertising the availability of “healthy” foods in those stores.

In recent years, city governments and NPOs are partnering to increase the availability of healthy food items in these corner stores. For example, as part of the Get Healthy Philly initiative beginning in 2010, The Food Trust and the PDPH developed a city-wide network of over 600 corner stores to improve healthy food access in low-
income urban neighborhoods of Philadelphia (PDPH, 2013). This is the largest Healthy Corner Store Network in the nation, committed to selling healthy products, i.e., fruits and vegetables, low-fat dairy, lean meats, and whole grains. There were two types of healthy corner stores in Philadelphia, described below.

**Level one healthy corner stores.** Healthy corner store owners agree to stock and market four new healthy food items in at least two categories: fruits and vegetables, dairy, whole grain products, proteins, and snacks/beverages. Owners also agree to implement marketing materials, such as banners, stickers, and signs, in their stores encouraging customers to make healthy choices. Stores making these required changes receive a $100 incentive each year. Currently, toolkits are being developed for store owners to assist them in marketing and selling healthier foods. Storeowners also receive at least one individualized training session on healthy food procurement and marketing. All stores automatically become members of the Philadelphia Healthy Corner Store Network and are eligible for the next level of engagement.

**Enhanced healthy corner stores.** Healthy corner stores that meet specific criteria receive one-on-one training and assistance to introduce cost-efficient changes in their stores to increase their capacity to sell healthy foods. In addition to specialized training, these stores also receive infrastructural changes, which include shelving and refrigeration to display and store fresh produce, inexpensive outdoor sidewalk stands for fresh produce, and increased shelf space to stock bottled water and healthy snacks. These investments or grants ranged from $1,000 to $5,000. For more information on healthy corner stores, visit: [http://www.foodfitphilly.org/eat-healthy/healthy-corner-stores](http://www.foodfitphilly.org/eat-healthy/healthy-corner-stores).
The ALTFOOD Index

Data and Methodology

The development of the ALTFOOD index involved GIS and qualitative methods. The index was created by a GIS model using ESRI ModelBuilder™ 10.0 and raster overlay analysis techniques. Once developed, the model was run using data from the City of Philadelphia. The final output of this index provided ordinal ranks of census tracts and planning districts based on their levels of access to alternative food outlets. Since a GIS-based model has been established, other variables can be added for similar studies in other communities.

Two methods – document reviews and interviews – were used to identify the variables and assign their weights in the ALTFOOD model. Identification of variables was primarily done by reviews of scholarly and grey literature. In 2012, I conducted interviews of representatives of 32 NPOs that have one or more types of alternative food programs, both at the neighborhood scale and city scale. These were among the 38 overall NPO interviews mentioned in Chapter 4. The interviewees were asked to give their opinions on the variables that were used in this model. In addition, the interviewees commented on the importance or weight of each variable in determining the state of alternative food programs in Philadelphia.

Based on the methodology described above, the ALTFOOD index included six variables: (i) GARDEN (areas with convenient access to community gardens), (ii) FARMARK (areas with convenient access to NPO-operated farmers’ markets), (iii) CSA (areas with convenient access to CSA pick-up locations), (iv) COOP (areas with
convenient access to food co-ops), (v) HLTSTOR1 (areas with convenient access to level one healthy corner stores), and (vi) HLTSTOR2 (areas with convenient access to enhanced healthy corner stores).

GIS data for these six variables were created as point shapefiles. These data showed locations of community gardens (GARDEN, n = 368), farmers’ markets (n = 47), CSA pickup locations (n = 48), food co-ops (n = 4), level one healthy corner stores (n = 440), and enhanced healthy corner stores (n = 200). The sources and geographic units of all the data used in this analysis have been listed in Table 12. Market farms, commonly known as urban farms, were not considered as a variable, because farms typically sell produce through farm stands, farmers’ markets, CSAs, co-ops, and directly to restaurants. While restaurants were not within the scope of this study, the other outlets were already included as separate variables.

Community garden address data were developed by the Garden Justice Legal Initiative of the Public Interest Law Center of Philadelphia (GJLI). In 2012, the GJLI launched a project to survey and interview gardeners and farmers citywide. The initial goal was to update the findings in the 2008 Philadelphia Harvest Report (Vitiello & Nairn, 2009) regarding the number and location of gardens and farms throughout the City of Philadelphia, as well as to determine the number of parcels currently serving as gardens/farms and the ownership, zoning, and other data related to those parcels, the support organizations associated with each site, and the names and contact information for garden leaders. GJLI is now building a database of the material obtained in the summer and fall of 2012 and has compiled a list of gardens/farms and their locations. The
data were provided to me as an address table. I geocoded these addresses using ArcGIS software, following the same methodology described in previous chapters.

Table 12

<table>
<thead>
<tr>
<th>Data</th>
<th>Data Type</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>GARDEN</td>
<td>Point</td>
<td>GJLI - PILCOP, Amy Laura Cahn, and Michael Paci, 2013</td>
</tr>
<tr>
<td>FARMARK</td>
<td>Point</td>
<td>Primary data, 2012</td>
</tr>
<tr>
<td>CSA</td>
<td>Point</td>
<td>Primary data, 2012</td>
</tr>
<tr>
<td>COOP</td>
<td>Point</td>
<td>Primary data, 2012</td>
</tr>
<tr>
<td>HLTSTOR1</td>
<td>Point</td>
<td>PDPH, 2012</td>
</tr>
<tr>
<td>HLTSTOR2</td>
<td>Point</td>
<td>PDPH, 2012</td>
</tr>
<tr>
<td>Census Tract</td>
<td>Polygon</td>
<td>U.S. Census Bureau, 2010</td>
</tr>
<tr>
<td>Poverty</td>
<td>Polygon</td>
<td>ACS, 2005-2009</td>
</tr>
<tr>
<td>Street</td>
<td>Line</td>
<td>Environmental Systems Research Institute (ESRI), 2010</td>
</tr>
</tbody>
</table>


As mentioned before, the majority of Philadelphia’s farmers’ markets are run by Farm to City and The Food Trust, and there are other independent farmers’ markets and farm stands throughout the city. In 2012, I compiled raw data of farmers’ markets from various online sources and shared them with the members of Philadelphia Urban Farm Network (PUFN) listserv to receive feedback. Following updates and suggestions from a number of members, I finalized the farmers’ market data, geocoded the addresses in GIS, and shared the data in an interactive website (http://batchgeo.com/map/phillyfarmersmarkets). Attributes included the size of the market (number of participating farmers), day and time of operation, and acceptance of
SNAP and EBT cards. This analysis only included the farmers’ markets that were operated by NPOs in conformance with the overall focus of this research.

In summer 2012, under my supervision, a few graduate students of the Intro GIS course offered by Temple University’s Department of Community and Regional Planning collected data on CSA pickup locations throughout the city. Attributes included mailing address, cost per week, number of food items, and season. Data were collected from an extensive search on the Internet using the Google search engine. A GIS point shapefile was created after geocoding those addresses. Data for food co-ops were created in the same process. GIS data for two types of healthy corner stores were provided by the PDPH. The PDPH specifically disclaims responsibility for any analyses, interpretations or conclusions.

For each of the six variables, including two types of healthy corner stores, I calculated three categories of distances from the service locations. Distance categories were chosen according to their level of convenience. While selecting these categories, I paid particular attention to the at-risk population group that was discussed in the RISK index in Chapter 4. A quarter-mile distance, which is commonly considered a reasonable walking distance for vulnerable populations (for example, McMillan, 2007; Bracha et al., 2010; Gordon et al., 2011) and equivalent to approximately five city blocks, was considered the most convenient access. The second category of access was a range from 0.25 to 1 mile and the final category considered access beyond 1 mile. The three categories were ranked 3 to 1, representing the most convenient/walkable access to the least.
The calculation was done using the raster-based Euclidean Distance tool, available under the Spatial Analyst tools of ArcToolbox, an application of ArcGIS. I started with the GARDEN (community gardens) variable. The analysis extent was set to the city boundary. The resulting raster layer, which was created with 100 ft$^2$ size cells, was reclassified into three categories using the “Reclassify” tool. Manual method was used for reclassification, with three break values – 1,320 feet or 0.25 mile, 5,280 feet or 1 mile, and the default 57,939 feet (representing the analysis extent). Finally, the reclassified raster layer was clipped to the shape of the city boundary. Similar processes were done for the other five variables (including two types of healthy corner stores) and finally six raster files were created, all categorized with three ranks.

As the previous model RELIEF (see chapter 5), the weight factor for each variable of ALTFOOD model was assigned using qualitative methods, i.e., document reviews and interviews. Among these six variables, community gardens (GARDEN) were perceived as the most accessible, both geographically and economically, to all types of demographics, including at-risk populations. Most interviewees provided a higher rank (0.3) to community gardens for multiple reasons: (i) community gardens were higher in numbers, located throughout the city, and more importantly densely positioned in lower-income neighborhoods, (ii) generally people of all races, ethnicity, and ages – from children to older adults – were engaged in gardening, (iii) except the start-up cost at the beginning of a season, community gardening was relatively inexpensive. The same higher rank (0.3) was provided to the “enhanced” healthy corner stores (HLTSTOR2). As alternatives to big-box supermarkets, these stores offered healthy food options within
walking distance of many lower-income neighborhoods. The rest of the variables were weighted equally (0.1), and the total weight equaled to 1.

Once the six data layers for the ALTFOOD model were processed, a raster overlay analysis was done based on the following formula:

\[
\text{Weighted Sum} = GARDEN * 0.3 + FARMARK * 0.1 + CSA * 0.1 + COOP * 0.1 + HLTSTOR1 * 0.1 + HLTSTOR2 * 0.3
\]

The final raster scores, calculated from the weighted sum formula, were aggregated twice in order to generate a score for each census tract and then again for each planning district. The zonal statistics algorithm, available as a tool in ArcToolbox under the Spatial Analyst tool set, was used for this purpose. This tool added up all the raster cells in a census tract (or a planning district) and calculated the mean raster score. The scores were reclassified to show 3 ordinal ranks – 1, 2, and 3 – representing low to high access to NPO-operated alternative food programs. This reclassified score was considered as the final ALTFOOD scores for the census tracts or planning districts.

**Results**

Figure 13 displays the results of the ALTFOOD model. The map shows rankings of Philadelphia census tracts, based on the level of convenient accessibility to alternative food outlets, provided by Philadelphia NPOs. Overall, 142 numbers of census tracts (about 37% of the total) had high accessibility to alternative food outlets, 138 tracts (36%) had medium, and the remaining 104 (27%) had low accessibility.
Figure 13. ALTFOOD scores in census tracts. The map shows low to high level of NPO-driven alternative food access.

Figure 14 displays the rankings of Philadelphia planning districts, based on the level of convenient accessibility to alternative food programs provided by Philadelphia NPOs. As seen in this map, four districts – Lower North, University/Southwest, West, and Central – had high access scores. Upper Far Northeast and Lower South districts secured the lowest scores.
Figure 14. ALTFOOD scores of Philadelphia planning districts. The map shows low to high level of NPO-driven alternative food access in a range of lighter to darker shades of color.

*Statistical Tests – ALTFOOD and LOWACCESS*

Once I calculated ordinal scores for each census tract and each planning district, I performed three statistical tests – Chi-square, Gamma, and Spearman's rho – to measure the associations or relationships between ALTFOOD and LOWACCESS in three different ways. The Chi-square test was done for census tracts by using a high number of samples (N = 384). The Gamma test was also done for the census tracts, because the three types of ranks (high, medium, and low) assigned for census tracts followed the
characteristics of a “collapsed” ordinal variable. I tested Spearman's rho for planning districts, as the sample size was low (N = 18) and the rankings followed the characteristics of “continuous” ordinal variable.

Table 13 displays observed and expected frequencies and results of the Chi-Square test (N=384) of the two variables – ALTFOOD and LOWACCESS. As shown in the table, ALTFOOD was strongly associated with LOWACCESS ($X^2 = 126.687$, $df = 4$, $p <0.00$). According to the Chi Square test for independence, the test statistic fell into the critical region and, therefore, I rejected the null hypothesis of independence.

The value of Gamma ($G$) was 0.65. This means there was a strong, positive relationship between two variables ALTFOOD and LOWACCESS. According to the Gamma test for significance, $Z$ (obtained) value was 7.881, which was higher than $Z$ (critical) value, ±1.96. Therefore, I rejected the null hypothesis.

Finally, I computed Spearman's rho to measure an index of the strength of association between two variables ALTFOOD and LOWACCESS. I performed this test for all the planning districts in Philadelphia (N=18). As shown in Table 14, $r_s$ value was 0.79, so there was a positive and direct correlation between two variables. This was a strong correlation, significant at 0.01 level. According to the Spearman's rho test for significance, $t$ (critical) was ± 2.120, but $t$ (obtained) was 5.15, so the null hypothesis was rejected.

The strong relationship between ALTFOOD and LOWACCESS suggests that generally census tracts or planning districts that had limited or no access to fresh food were receiving the most interventions by the NPOs. The projects and programs associated
with alternative or community food movements in Philadelphia were heavily focused on areas that lacked convenient access, with a few minor exceptions. The Central district scored medium in terms of its healthy food access, but the district had a much higher level of alternative food programs and activities. On the other hand, the River Wards district had the opposite scenario (low level of healthy food access but medium level of programs offered). Such spatial mismatch issue, however, was not as intense as I found between two variables HUNGER and RELIEF that I studied in Chapter 5.

Table 13

**Chi-Square and Gamma Tests – LOWACCESS and ALTFOOD**

<table>
<thead>
<tr>
<th>ALTOFOOD (Y)</th>
<th>LOWACCESS (X)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>102</td>
<td>35</td>
<td>5</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>74</td>
<td>45</td>
<td>19</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>20</td>
<td>21</td>
<td>63</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>196</td>
<td>101</td>
<td>87</td>
<td>384</td>
<td></td>
</tr>
</tbody>
</table>

**EXPECTED FREQUENCIES**

<table>
<thead>
<tr>
<th>ALTOFOOD (Y)</th>
<th>LOWACCESS (X)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>72.48</td>
<td>37.35</td>
<td>2.17</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>70.44</td>
<td>36.30</td>
<td>1.27</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>53.08</td>
<td>27.35</td>
<td>3.57</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>196</td>
<td>101</td>
<td>7</td>
<td>384</td>
<td></td>
</tr>
</tbody>
</table>

\[p = 0.00000000000000000000000000000003, \quad p < 0.00, \quad \chi^2 \text{ (obtained)} = 126.687\]

Chi Square test for independence

Sampling distribution = \(X^2\) distribution, Alpha = 0.001

Degrees of Freedom = 4 (3x 3 Table = (3-1)*(3-1) = 4)

\(X^2\) (critical) = 18.465, \(X^2\) (obtained) = 126.687, null hypothesis rejected.

Gamma \(G\) = 0.65

Testing Gamma for Significance

\[Z \text{ (obtained)} = 7.881\]

Sampling distribution = z distribution, Alpha = 0.05

\[Z \text{ (critical)} = \pm 1.96\], null hypothesis rejected.
Table 14

Computing Spearman's rho – LOWACCESS and ALTFOOD

<table>
<thead>
<tr>
<th>District Name</th>
<th>LOWACCESS (X)</th>
<th>ALTFOOD (Y)</th>
<th>D</th>
<th>D²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>7.5</td>
<td>15.5</td>
<td>-8</td>
<td>64</td>
</tr>
<tr>
<td>Central Northeast</td>
<td>2.5</td>
<td>6</td>
<td>-3.5</td>
<td>12.25</td>
</tr>
<tr>
<td>Lower Far Northeast</td>
<td>2.5</td>
<td>3</td>
<td>-0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>Lower North</td>
<td>18</td>
<td>17.5</td>
<td>0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>Lower Northeast</td>
<td>9.5</td>
<td>8.5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lower Northwest</td>
<td>5</td>
<td>8.5</td>
<td>-3.5</td>
<td>12.25</td>
</tr>
<tr>
<td>Lower South</td>
<td>3</td>
<td>1.5</td>
<td>1.5</td>
<td>2.25</td>
</tr>
<tr>
<td>Lower Southwest</td>
<td>9</td>
<td>4.5</td>
<td>4.5</td>
<td>20.25</td>
</tr>
<tr>
<td>North</td>
<td>15</td>
<td>13.5</td>
<td>1.5</td>
<td>2.25</td>
</tr>
<tr>
<td>North Delaware</td>
<td>7.5</td>
<td>4.5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>River Wards</td>
<td>15</td>
<td>8.5</td>
<td>6.5</td>
<td>42.25</td>
</tr>
<tr>
<td>South</td>
<td>12</td>
<td>13.5</td>
<td>-1.5</td>
<td>2.25</td>
</tr>
<tr>
<td>University/Southwest</td>
<td>18</td>
<td>17.5</td>
<td>0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>Upper Far Northeast</td>
<td>5.5</td>
<td>1.5</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Upper North</td>
<td>13</td>
<td>12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Upper Northwest</td>
<td>5.5</td>
<td>8.5</td>
<td>-3</td>
<td>9</td>
</tr>
<tr>
<td>West</td>
<td>13</td>
<td>15.5</td>
<td>-2.5</td>
<td>6.25</td>
</tr>
<tr>
<td>West Park</td>
<td>9.5</td>
<td>11</td>
<td>-1.5</td>
<td>2.25</td>
</tr>
<tr>
<td>N = 18</td>
<td></td>
<td></td>
<td>∑D = 0</td>
<td>∑D² = 203</td>
</tr>
</tbody>
</table>

\[ r_s = 1 - 6 \left( \frac{\sum d^2}{N(N^2 - 1)} \right) = 0.79 \]

Testing Spearman RH0 for significance:
Sampling distribution = t distribution
Alpha = 0.05, Degrees of freedom = N – 2 = 18 - 2 = 16
\[ t \text{ (critical)} = \pm 2.120, t \text{ (obtained)} = 5.15, \text{null hypothesis rejected.} \]

Issues and Challenges

Based on the above analyses and findings, it can be said that although NPOs offer a diverse range of programs to address the issues related to healthy food access, specifically in disadvantaged neighborhoods, there are debates associated with these programs. In addition, NPOs face operational or organizational challenges. The following
discussion highlights some of the key debates and challenges that were evident from literature reviews and NPO interviews.

**Program Operation**

NPO-operated alternative food programs face operational challenges due to limited funding and manpower. For example, due to budgetary restrictions, among other challenges, many community gardens may need to close after just one year of operation, as it takes a tremendous commitment of time and other forms of investments to create and sustain a productive food-producing garden. This issue was raised by a number of interviewees during my NPO interview process. Here is one example:

I don’t understand why people think that Philadelphia is making all this great progress in the urban agriculture arena. Just look at the numbers. We had 1,100 [community gardens] in the mid-1990s, then 500 in the mid-2000s, and now only 200 something in 2008. Is it progress? We couldn’t sustain [the majority of] our gardens. Yes, [new] gardens are popping up every year, but how many of them sustain over the time? (An interviewee from Central District)

Two types of healthy corner stores in Philadelphia are trying to change the food environment of inner city neighborhoods. It will, however, take time to fully understand the impact of these stores in terms of community health. According to a few interviewees, continuity is an important factor or issue for some corner stores. There are examples of businesses that made partnerships with the PDPH and TFT, became members the *Philadelphia Healthy Corner Store Network*, but could not continue in the long run. As mentioned before, an undergraduate student randomly visited 26 corner stores and a few of them did not offer many healthy food options even though they participated in the network. An NPO representative agreed with this finding and expressed concerns about
not having long-term commitments and risk-taking attitudes by some corner store owners.

Laissez-faire small-scale partnerships between the city government and some nonprofits might have worked to a certain extent in some cities … including Philadelphia. But is it enough to bring changes to urban food landscape? I doubt if this is a permanent solution. Many such store owners may not have civic-mindedness or awareness about food deserts and food swamps. We need businesses with long-term commitments. (An interviewee from Lower Northeast District)

It takes tremendous amount of time, sometimes years, to form a food co-op and then start a fully-functional co-op grocery store. According to an interviewee who tried to start a food co-op, managing co-op members and their commitments to work a two-three hour shift could be challenging, as there are so many members and employees to deal with. Many co-op grocery stores attract specific clientele who shop there for locally-grown organic foods and specific items, such as “fancy”, “uncommon” cheeses or artisan vegetables. Usually, these grocery stores are not spacious and the varieties of products are not comparable with regular full-scale grocery stores. Co-op stores, according another interviewee, are generally perceived as the stores for the wealthy.

Unless strategically located and priced, farmers’ markets are considered as “pricy” outlets. The variety of food items may be another issue, as some markets have only one or two vendors. One interviewee mentioned that farmers’ markets usually attract repetitive customers – people who care about local food, organic food, or artisan food, regardless of the price tag. Markets that have a large number of vendors or tables sometimes have crowd control issues, according to an interviewee from the Central district. Another interviewee commented that continuity could be a major challenge for a
few farmers’ markets. He provided an example of a farmers’ market that started off nicely with 16 vendors offering lots of varieties of produces and products, which within a year became a much smaller market with only seven vendors offering limited produce at higher prices.

The alternative food outlets are mostly informal. Community gardens, for example, are seasonal, operating from early spring to late fall. Greenhouses or other climate-controlled production spaces are mostly evident in market farms, not community gardens. Most farmers’ markets usually meet only once a week and for specific time slots. As reported earlier, Philadelphia’s only indoor farmers’ market was open six days a week throughout the whole year in 2012. Most corner stores, “healthy” or not, are not open for business throughout the day or every day of the week.

Economic Contribution

The economic contribution of many alternative food programs, according to some interviewees, is very limited. It is difficult, if not impossible, to find actual data on the production and sales of produce through these food programs. Only estimated numbers are available which has been reported earlier in this chapter. These programs generally do not offer many full-time jobs with decent salaries or benefits. Most community food projects are supported by volunteers or low-wage laborers and by financial and organizational supports from government and for-profit organizations, as well as through partnerships with other NPOs. Most programs are more focused on developing transferable skills rather than creating long-term employment opportunities, according to an interviewee. A relevant quote is provided here:
Growing or selling food through an alternative market does not make us money, with the exception of downtown locations. Many alternative food programs are not about money, but community development. But at the same time I wish those could be business development and job creation projects … in the real sense. (An interviewee from River Wards District)

*Community Buy-In and Involvement*

People do not necessarily want to devour whatever is provided by alternative food movement, as long as there is a habit of or options for consuming cheap, unhealthy but yummy fast foods and sugary drinks. Sometimes, it is not a habit issue, but time management issue. As discussed in Chapter 4 under HABIT indicator, many lower-income people with multiple low-paying jobs, often located outside of their neighborhoods and with one or more children, rarely have time to cook food from scratch. Similar viewpoints were expressed by a few interviewees as well. Besides habit, some people do not participate in community food movements because of their unfamiliarity with the concept. For example, in terms of community gardening participation, there is a generational and cultural gap between younger and older residents, because most second-generation-and-beyond urban residents are out of touch with gardening regardless of race (Meenar & Hoover, 2012).

Achieving trust of neighborhood residents and securing community involvement are two major issues for the NPOs to overcome in order to succeed with their community food programs. Among all types of alternative food programs, this is more applicable to community gardening projects. An interviewee explained this point nicely:

People see [NPOs] come and go and they become very skeptical. First of all, you just cannot come in [a neighborhood] and start digging soil [for food production]. Philadelphia has hundreds of class-conscious
neighborhoods. It’s easy to be perceived as “other”, regardless of your race. Sometimes [NPOs] come up short in encouraging community engagement and overall longevity [of the programs]. It’s crucial to do [projects] consistently for 4-5 years and only then you’ll get that buy-in. (An interviewee from Lower North District)

Social Exclusion

Based on qualitative research, a group of scholars have criticized community food movements in lower-income minority neighborhoods as a White movement and exclusionary practice (Slocum, 2006; Guthman, 2008, 2011; Alkon & McCullen, 2010). This refers to the exclusion of a group of people based on their inability to participate in community food movements due to financial, racial, age, or access limitations and their perceived socioeconomic status (Meenar & Hoover, 2012). Many farmers markets, food co-ops, and CSAs are perceived to be geared toward middle to upper class populations and rarely do they address the food deserts or food swamps – that is, an area with a saturation of unhealthy or fast food outlets – located in lower-income neighborhoods. According to an interviewee, farmers’ markets primarily target “high-income White customers,” unless strategically located in disadvantaged neighborhoods; an example of such an initiative would be the ten markets operated by PDPH and TFT in such neighborhoods.

According to a few interviewees, most community food movement projects are characterized as “White, top-down activities,” primarily initiated by specific categories of the urban population – the “creative class,” the “hipsters,” or the “White youth.” In some cases, community gardening is practiced by a White population in predominantly Black neighborhoods (Meenar & Hoover, 2012). These are usually member-only gardens with
long waiting lists. On the other hand, some interviewees observed that Black populations in some disadvantaged neighborhoods voluntarily exclude themselves from community food movements. They consider the movement as “the White thing” and sometimes even associate projects such as urban farming with race and slavery. There is another thought process that does not necessarily relate social exclusion to race: according to them, it is a perception deficit; because the efforts and contributions made by racial minority populations or immigrant populations doing on-the-ground community-building projects are not as visible or advertised as that of White populations (Meenar & Hoover, 2012).

Government Policies

It is vital to have active support from the city government to make the community food movement successful. Earlier in this chapter, I have discussed the partnership between the PDPH and an NPO (TFT) that introduced 15 farmers’ markets in lower-income neighborhoods in Philadelphia. In addition, the mayor’s Greenworks plan (2009) has a goal to bring local food within a 10-minute walk of 75 percent of city residents. The plan, however, does not have the ‘teeth’ it needs to force City Council Members to promote community food movements in their districts. This is particularly applicable to urban agriculture activities. Many urban agriculture projects, such as community gardens, have been treated as a temporary and informal land use, although the projects, in part, emerged “as a response to urban disinvestment and unsuccessful government interventions” (Meenar et al., 2012, p. 7). Land tenure conflicts, generational succession, and declining and uneven support often cause the untimely demise of many community gardens (Lawson, 2005; Vitiello & Nairn, 2009). Although Philadelphia’s recent
comprehensive zoning reform has responded to the rise in attention to urban agriculture by creating an urban agricultural land use designation, representatives of several NPOs expressed frustrations over little or limited support from the city. This topic will be discussed in more detail in Chapter 8.

Conclusion

Based on an assumption that NPOs are the backbone of the community food movement, this chapter has discussed the work of NPOs (with or without formal 501(c)(3) status) that had any “alternative food movement” related programs or projects in Philadelphia. The focus of the analysis was on the place-based interventions of these NPOs that were targeted toward food insecure and vulnerable populations. Through the development of an ALTFOOD index, Philadelphia census tracts and planning districts were ranked based on their convenient access to NPO programs offering alternative food programs. About 37% of census tracts had high accessibility to these programs or outlets, 36% had medium, and the remaining 27% had low accessibility. In terms of planning districts, Lower North, University/Southwest, West, and Central districts had high access scores, whereas Upper Far Northeast and Lower South districts secured the lowest scores.

Statistical test results showed that ALFOOD and LOWACCESS variables had strong, positive relationships. This means that NPOs generally offered alternative food programs more frequently and densely in areas with low access to healthy and fresh food and/or areas with at-risk populations. Although these programs generally do not offer any spatial mismatch issue, they are not free from criticisms, limitations, and challenges.
Almost all of these programs face operational challenges, including the management, continuity, consistency, and quality of programs. Another important challenge comes in the form of community buy-ins. The economic contributions of some of these programs are not well-understood or well-studied. All of these programs are, to various extents, dependent on local government policies, in addition to state or federal policies, to become consistently successful. A major criticism that some of these alternative food programs face is social exclusion. Some of these programs are perceived as movements primarily led by the White population, or concepts primarily driven by the wealthy. Racial and economic minority populations in some neighborhoods do not identify themselves with these programs and eventually become excluded from these movements. NPOs try to overcome these challenges and issues through various community development and capacity building programs, which will be discussed in Chapter 7.

Next Chapter

In the next chapter (Chapter 7), I will offer a qualitative assessment of food-focused NPO programs that are related to community development and capacity building efforts. By analyzing NPO survey results, I will discuss whether or how NPO activities and programs respond to the overall PFIVI scores that were assigned to Philadelphia’s 18 planning districts in chapter 4.
CHAPTER 7
NPOS AND THEIR COMMUNITY CAPACITY BUILDING

This is the third and final chapter on my analysis and discussions of NPO interventions addressing the issues of community food insecurity and vulnerability within the context of urban neighborhoods. Here, I discuss NPOs and their food-related programs and events that are tied with community development and community capacity building efforts. This study was focused on private NPOs, such as community-based or grassroots organizations (with or without formal 501(c)(3) status) and community development corporations, that offered or participated in any food-related programs and served constituencies of varied scales, such as a neighborhood, city, or region. Other nonprofit organizations such as educational or religious institutions and foundations were not included in this analysis. As in the previous chapters, this analysis was based on Philadelphia, but would be relevant to other similar cities.

Community capacity building efforts in urban neighborhoods are typically designed, catalyzed, and funded by NPOs (Chaskin, 1999). The primary purpose of this analysis was to examine whether or how NPOs through their community capacity building programs and events responded to the overall PFIVI scores that were assigned to Philadelphia’s 18 planning districts in Chapter 4. This work was built upon an assumption that NPOs initiate community development and capacity building activities more vigorously (with higher levels of services) in areas with higher PFIVI scores. Some areas with lower scores, however, may not have such offerings. Another assumption was
that areas with higher PFIVI scores generally are targeted by a higher number of NPOs that have a higher organizational network density. Two types of organizational networks were examined in this study: networks inside the neighborhoods (bonding networks), and networks outside the neighborhoods (bridging networks). Since there was no universally-accepted definition and/or boundary designation for Philadelphia neighborhoods available, I decided to use planning district boundaries as geographic units for this analysis.

Selection of Study Samples

In Chapters 5 and 6, I have analyzed food-related programs or projects offered by NPOs, but in this chapter I focused on NPOs as organizations. Smaller grassroots organizations that were known for a single food-centric program such as a community garden were also included in this study. Since a complete list of NPOs that had food-focused or food-related programs in Philadelphia was not readily available, I had to rely on a number of sources. As the first step, I collected a list of members of the DVRPC food systems stakeholder committee. Included in this list were about 40 member organizations that had any type of food-related program in Philadelphia. As I came to find, many NPOs were not members of this stakeholder committee and hence were not covered in this list. Then I collected names of other NPOs and contact information, if available, from three online sources, starting with GuideStar (www.guidestar.org). This is a national web database that gathers and disseminates information to paid subscribers about every single IRS-registered NPOs. I started searching for organizations using
various keywords related to food and nutrition, but in the end I could not generate a complete list of NPOs that had food-related programs in Philadelphia.

The Urban Institute’s National Center for Charitable Statistics (NCCS) is the national clearinghouse of data on the nonprofit sector in the US (www.nccsdataweb.urban.org). Temple University’s Metropolitan Philadelphia Indicator Project (MPIP) had membership with and subscribed to NCCS data. The US-based NPOs are listed in the NCCS database according to 26 major categories. Among 2,200 plus NPOs listed in the Philadelphia geographic area, I went through category K (Food, Agriculture, and Nutrition), but was provided with a list of only 17 organizations. A number of NPOs that had a combination of food and other focus areas were categorized differently, such as Category S (Community Improvement, Capacity Building). Moreover, organizations that did not have formal 501(c)(3) status were to be included in this study, but information about those organizations was not available in either the GuideStar or NCCS databases. Finally, I collected a list of about 90 organizations from PACDC website (www.pacdc.org). However their programs were not listed in detail, so it was difficult to determine which ones had food-related programs.

After going through all these sources, I compiled a list of 3,182 NPOs of all types serving Philadelphia County and then created a draft initial list of about 250 NPOs that offered any food-focused or food-related programs. All the addresses were geocoded and GIS shapefiles were created using similar methodology described in the previous chapters. Two undergraduate students and I went through every organization’s website or social media site (i.e., blog sites or Facebook page), all that were available, and verified if
they had any food-focused program in any part of Philadelphia. Based on this verification process, I finalized a list of 153 NPOs (study samples) with contact information such as email addresses. This whole process took about 10 months to complete – from September 2011 to June 2012. Figure 15 shows the spatial distributions of all the NPOs across various planning districts throughout the city. Table 15 shows the distributions of two categories of NPOs located in 18 planning districts: (i) all 3,182 NPOs serving in the city and (ii) only 153 NPOs that are being studied. As we see, in both categories most NPOs were located in the Central District.

Figure 15. Locations of NPOs are shown as points. Philadelphia planning districts have three types of colors showing three PFIVI scores – low to high levels of food insecurity and vulnerability.
<table>
<thead>
<tr>
<th>Planning District Name</th>
<th>All types of NPOs</th>
<th>% of all NPOs</th>
<th>NPOs being Studied</th>
<th>% of NPOs being Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>1,346</td>
<td>42%</td>
<td>52</td>
<td>34%</td>
</tr>
<tr>
<td>Central Northeast</td>
<td>78</td>
<td>2%</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Lower Far Northeast</td>
<td>45</td>
<td>1%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Lower North</td>
<td>207</td>
<td>7%</td>
<td>15</td>
<td>10%</td>
</tr>
<tr>
<td>Lower Northeast</td>
<td>51</td>
<td>2%</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Lower Northwest</td>
<td>75</td>
<td>2%</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Lower South</td>
<td>17</td>
<td>1%</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Lower Southwest</td>
<td>19</td>
<td>1%</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>North</td>
<td>145</td>
<td>5%</td>
<td>7</td>
<td>5%</td>
</tr>
<tr>
<td>North Delaware</td>
<td>36</td>
<td>1%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>River Wards</td>
<td>73</td>
<td>2%</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>South</td>
<td>127</td>
<td>4%</td>
<td>9</td>
<td>6%</td>
</tr>
<tr>
<td>University/Southwest</td>
<td>295</td>
<td>9%</td>
<td>23</td>
<td>15%</td>
</tr>
<tr>
<td>Upper Far Northeast</td>
<td>74</td>
<td>2%</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Upper North</td>
<td>104</td>
<td>3%</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Upper Northwest</td>
<td>256</td>
<td>8%</td>
<td>15</td>
<td>10%</td>
</tr>
<tr>
<td>West</td>
<td>107</td>
<td>3%</td>
<td>6</td>
<td>4%</td>
</tr>
<tr>
<td>West Park</td>
<td>127</td>
<td>4%</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>3,182</td>
<td>100%</td>
<td>153</td>
<td>100%</td>
</tr>
</tbody>
</table>

As seen in Figure 15, the spatial concentration of food-focused NPOs is not thoroughly consistent with PFIVI scores. High PFIVI score district such as Lower Northeast has only one such NPO, whereas low PFIVI score district such as Central has the highest numbers of NPOs. It is, however, true that office locations of NPOs may not be a good indicator, because many NPOs have programs far from their office locations and many NPOs have city-wide service areas. Therefore, NPO contributions to community capacity building need to be understood through their programs, events, and other activities.
Examination of NPO Activities

In addition to providing hunger relief (indicator – RELIEF, discussed in Chapter 5) or healthy foods through alternative outlets (indicator – ALTFOOD, discussed in Chapter 6), many NPOs have “food”-related policies, programs, projects, or initiatives that complement their overall community development and community capacity building efforts. The purpose of this section is to understand how NPOs address a number of variables that are tied with these efforts.

Data and Methodology

Following literature reviews in Chapter 2 (Skinner, 1997; Chaskin, 1999; Taylor, 2003), the variables used in this analysis were grouped into four categories: (i) Human capital related variables – including the enhancement of individual ability (Chaskin, 2001) and cultivation of transferable knowledge and skills (Goodman et al., 1998), such as food-related educational and training programs, internship and voluntary work programs, and events; (ii) Physical and financial capital related variables – including community economic development (Ferguson & Dickinson, 1999; Phillips & Pittman, 2009), such as creating or retaining jobs through food-related programs, assisting local businesses, and producing food in vacant lands; (iii) Social capital related variables – including equity and empowerment (Coleman, 1988; Twombly et al., 2000; Labonte et al., 2002) and citizenship (Fallov, 2010), such as vulnerable population engagement and community engagement; and (iv) Organizational capital related variables (Chaskin, 2001; Labonte et al., 2002) – including inter-organizational network, network density, and bridging and bonding network.
Data were not available for all the NPOs that had any food-related programs in Philadelphia. In order to collect primary data, I implemented an online survey in fall of 2012. The survey was designed for NPOs that have any “food”-related policies, programs, projects, or initiatives in Philadelphia. The primary stated purpose of this survey was to catalogue and analyze how NPOs provide healthy food access, support local food systems, promote food justice, develop social and organizational networks, build community capacity, and offer education, training, and jobs. The survey pertained to the organizations themselves and it did not ask any personal questions of the individual respondents. The survey was distributed to the administrators, management staff, or other representatives of 153 NPOs (study samples). Six emails bounced back because of invalid email addresses. Ultimately, the survey reached out to 147 NPOs.

The 28-question survey had the following major sections: basic information about the NPOs, programs and events, organizational relationships, local economy, and communication. In addition, there were a few hidden questions, which were visible only if a response needed more clarification. The survey was active for two months, starting from October 14, 2012. The survey yielded responses from representatives of 116 NPOs (a response rate of 79%). About 56% of the respondents were administrators or managers. The rest were staff, board members, directors, founders, members, or volunteers. This section summarizes the major findings.

The analysis is based on mixed methods, including descriptive statistics, interviews, and observations on the ground. I did not follow the GIS-based methods that I used to analyze the RELIEF and ALTFOOD indicators (in chapter 5 and 6 respectively),
but took a different approach for this analysis. Instead of doing a census tract based analysis, I did a descriptive analysis of those NPO survey responses applicable to the whole city. There were two primary reasons for choosing this methodology:

Data for all the variables for both RELIEF and ALTFOOD indicators were available for the whole city. Those were not samples, but the complete datasets. In order to do similar type of analysis, it was necessary to get data on each and every NPO that had food-related program in Philadelphia. Since the NPO survey did not receive 100% participation, it was impossible to get city-wide data for any of the variables. Data were available only for a sample population (79% of NPOs, in this case). Moreover, not every NPO answered every question. For example, there was a question – how many training programs did the NPO offer in the last 12 months? Answers were received from only 86% of the NPOs who participated in this survey. Because of varied response rates for different questions, it was not possible to calculate the total numbers of training programs offered or the total count for other variables in each census tract.

The NPOs participated in this survey had different types of service areas – sometimes neighborhood-based (or community-based), sometimes city- or even region-based. It was difficult to assess their roles at the census tract level. An NPO may be physically located in a census tract, but their programs may be implemented all over the city or in various neighborhoods, so the impact of their work is not applicable to only one census tract.

Documenting or digitizing NPO service areas in GIS took a long time. In determining the source of information to draw service area polygon shapefiles, I relied
first on survey response text, especially if it matched with specific geographies (zip codes, neighborhood names, street boundaries, etc.), then using information gleaned from an NPO's website or other online sources. The description given in the survey response was prioritized; if an organization provided multiple geographic indicators, either in their response or in other online material, the most geographically discrete (or specific) definition was used.

Where no explicit neighborhood or service area was described in the online research or organization website, inferences were made based on the most likely geographical area a site served by default, in that those who patronize certain types of nonprofits or institutions will most likely serve the immediate neighborhood in which it is located.

The Editor tool in ArcGIS was used to create the polygon shapefiles. In drawing the polygon shapefiles themselves, according whichever type of geography was used by an organization (zip code, census tract, neighborhood, political ward, etc.) we adhered to pre-existing spatial data. For particular neighborhoods, a neighborhoods file created by the Philadelphia City Planning Commission was utilized. For those NPOs listing only “regions” of the city of Philadelphia, such as “West Philadelphia” and “Southwest Philadelphia,” shapes were drawn roughly based on the City of Philadelphia’s Planning Analysis divisions.
Results

About the NPOs

About 71% of NPOs that participated in this survey had official 501(c)(3) status. About 92% of NPOs had their offices in Philadelphia, the rest were located outside the city but had programs in the city. Most of these organizations (43%) were established in the 2000s, 15% were established during the 1990s, 19% were during the 1980s, 15% were during the 1970s, and the rest were before 1969. In the last group, two NPOs were established in the 19th century (Pennsylvania Horticulture Society in 1827 and The Merchants Fund in 1854). The annual operating budget of the participant NPOs varied greatly. There were a few organizations without any operating budget and there were a few with a budget of 5 to 18 million U.S. dollars. The majority (68%) respondents had a budget between $10,000 and $100,000.

In terms of the numbers of full-time and part-time staff, the organizations varied greatly. The largest organization reported 200 full-time staff but no part-time. On the other hand, 17% organizations reported that they had no full-time staff and only 1-4 part-time. They mostly relied on voluntary services. A few organizations mentioned that they hired full-time employees only during the growing season. About 27% of organizations had 1-5 full-time staff and 1-12 part-time. The majority (39%) reported that they had 6 to 30 full-time staff and 0 to 20 part-time. The remaining organizations had 70 or more (up to 200) full-time staff and 0 to 70 part-timers.

Almost every organization included more than one focus areas in their mission. The areas were food distribution (49%), community economic development (47%),
community capacity building (45%), food education and training (42%), food production (36%), food justice (35%), food security (27%), food advocacy (25%), and food policy (25%). Other focus areas included meals for seniors, sustainable food system, and food waste management.

About 52% of the NPOs were literally community-based and they reported designated service areas. Examples include the Village of Arts and Humanities, New Kensington CDC, and People’s Emergency Center. The rest of the NPOs were either issue-based (not place-based) or had city-wide service areas. A few NPOs, including Philabundance, Fair Food, The Common Market, and The Food Trust, considered Philadelphia metropolitan region as their service areas. Another category of NPOs, such as The SHARE Food Program or Teens 4 Good (aka, The Federation of Neighborhood Centers), had community-based programs, but their programs were distributed in a number of neighborhoods. Figure 28 shows 80 NPOs that had specific community-based service areas, following zip codes, neighborhoods, or other types of boundaries, and ranging from 0.08 to 66 square miles, with a mean value of four square miles for a service area.
Figure 16. NPO service areas. The map shows the point locations of 153 NPOs being studied in this research, as well as service area boundaries of 80 NPOs.

*Human Capital Related Variables*

*Programs.* Philadelphia NPOs offer or organize various types of food-focused programs throughout the year. Each of the 48% of NPOs that participated in this survey offered educational and training programs about 10 times in one year. These programs attracted a wide range of people, ranging from just 5 to 300. Table 16 provides more details. Not included in this table was an organization that offered such programs 150 times in a year that drew a total 4,000 participants.
Table 16

<table>
<thead>
<tr>
<th>NPOs (%)</th>
<th>Times Offered</th>
<th>No of Participants (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.28%</td>
<td>10 and under</td>
<td>5 to 300</td>
</tr>
<tr>
<td>27.58%</td>
<td>11 to 25</td>
<td>85 to 500</td>
</tr>
<tr>
<td>24.14%</td>
<td>26 to 100</td>
<td>100 to 800</td>
</tr>
</tbody>
</table>

In general, the numbers of internship or voluntary programs offered were half the numbers of educational or training programs. About 62% of NPOs offered internships or voluntary work programs 1 to 5 times a year. A range of 1 to 80 participants enrolled in these programs. See Table 17 for more details.

Table 17

<table>
<thead>
<tr>
<th>NPOs (%)</th>
<th>Times Offered</th>
<th>No of Participants (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>61.90%</td>
<td>1 to 5</td>
<td>1 to 80</td>
</tr>
<tr>
<td>14.29%</td>
<td>6 to 20</td>
<td>35 to 300</td>
</tr>
<tr>
<td>23.81%</td>
<td>21 to 50</td>
<td>5 to 4,000</td>
</tr>
</tbody>
</table>

Community events. Many Philadelphia NPOs host or arrange food-focused events throughout the year. The next few questions were about events such as block parties, potlucks, work parties, fundraising events, lectures or discussions, movie or music events, tours, and workshops (i.e., cooking, food preservation, drip irrigation, and green roof). A few answers were considered invalid. For example, one NPO representative answered that they offered “0” events, but they received 200 participants. According to the valid responses, about 76% NPOs offered 10 or fewer numbers of events in one year. These events were of various scales, attracting a wide range of participants, from only 5 to 20,000 people. About 75% of these events had fewer than 100 participants. Only two
NPOs reported that their events attracted the highest numbers of visitors – 10,000 and 20,000 visitors respectively. Table 18 provides a detail breakdown of these categories.

<table>
<thead>
<tr>
<th>NPOs (%)</th>
<th>Times Offered</th>
<th>No of Participants (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>75.82%</td>
<td>10 and under</td>
<td>5 to 20,000 (75% of the events had under 100 participants)</td>
</tr>
<tr>
<td>14.29%</td>
<td>11 to 25</td>
<td>8 to 300</td>
</tr>
<tr>
<td>9.89%</td>
<td>26 to 100</td>
<td>10 to 150</td>
</tr>
</tbody>
</table>

*Physical Capital Related Variables*

*Jobs.* About 71% of the NPOs that participated in this survey reported that their food-related projects created or retained 1 to 10 jobs during the last 12 months. About 19% NPOs reported 11 to 25 jobs. The rest of the NPOs created or retained 26 or more jobs. These numbers included part-time jobs, but not seasonal, farming jobs.

*Assistance to local businesses.* About 72% of NPOs that responded to the survey assisted other organizations or local businesses, which included monetary, labor, or other forms of assistance. The following quotes provide some examples of such assistance:

- Landscape maintenance, produce and plant material procurement, construction labor and consulting, and technical assistance to 7 local businesses.
- Food, funds, expertise, logistics support, counsel and advice.
- We assisted … a non-profit in the process of securing grant funding for a garden project involving their senior facility.
- We provide support to 32 partner sites across the city, including orchard design, planting materials, event organizing, and training in orchard care. We also provided technical support for 5 orchards not planted by us.
- Providing fresh produce to corner stores near gardens.
We work with about 4 different [agencies] to provide food and nutrition talks for their consumers at their location.

Roughly 20 businesses along Lancaster Avenue – financial literacy, storefront improvements, technical assistance.

*Food production in vacant lands.* Even though only 36% of the NPOs that participated in this survey mentioned food production as one of their missions, 71% of the respondents had some kind of food production or UA programs. About 45% NPOs claimed that their UA program participants primarily came from their own constituencies. About 59% of organizations revamped vacant land for food production in their service areas. Most organizations managed a wide range of 1 to 30 city parcels, located either in a single or multiple neighborhoods. One organization representative said they maintained 2,000 properties equivalent to 10 million square feet of land. The nature of land ownership varied as well.

About 31% of the NPOs that responded to this survey owned lands for running UA programs or activities. About 17% had a lease from the city and 48% had an agreement with private property owners. In many cases, NPOs practiced UA projects on a number of vacant lots, either adjacent or separated, but the lots had different types of owners – city agencies or private owners. About 21% of NPOs that participated in this survey practiced guerrilla gardening, a practice of gardening on an abandoned site or an area not cared for by anyone, without any legal right to use it. Either they did not know the property owners or did not think about leasing. Table 19 gives more details on the nature of land ownerships. In addition, two quotes from the survey responses are provided, referring to the issues with leasing from the city.
Table 19

<table>
<thead>
<tr>
<th>Land Tenure Situation</th>
<th>% of NPOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own land</td>
<td>31%</td>
</tr>
<tr>
<td>Leased from the city</td>
<td>17%</td>
</tr>
<tr>
<td>Applied for lease with the city</td>
<td>3%</td>
</tr>
<tr>
<td>Have an agreement with private property owner</td>
<td>48%</td>
</tr>
<tr>
<td>Do not know the property owner</td>
<td>14%</td>
</tr>
<tr>
<td>Not thinking about leasing</td>
<td>7%</td>
</tr>
<tr>
<td>Have experienced land tenure problems</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>34%</td>
</tr>
</tbody>
</table>

All … orchards (32 sites and counting) are planted in partnership with community groups who either own the land (60%) or have a long term lease for usage (40%, mostly city-owned properties).

The city generally does not "lease" properties--it creates Urban Garden Agreements. These are not leases, but rather loose acknowledgements from the city that they know you are using the land & have permission. There are no protections against someone else coming in & buying up the space from underneath you.

Social Capital Related Variables

Engaging vulnerable population. There was a question about the percentage of NPO programs that were targeted toward vulnerable/ disadvantaged populations (i.e., older adults, lower-income, minority, refugees, ethnic groups, and minority religious groups). About 28% of NPOs who answered this question mentioned that their programs were open for all. “We do not target specific group of populations, our programs are all-inclusive” was one comment. The majority, 33% of the NPOs that participated in this survey, reported that at least ¾ of their programs, if not all, were targeted toward vulnerable or disadvantaged populations. About 16% of NPOs said that about ½ to ¾ of their programs had a similar agenda. Detailed data are available in Figure 17. A follow-
up question concerned the financial accessibility of the food-related events hosted by NPOs. About 76% of NPOs said their events were free and 10% said their events were donation based. Only 15% charged a fee, ranging from $5 to $65 per event. About 58% of organizations that had any produce-selling programs accepted either one or more types of government assistance cards (i.e., EBT, WIC). It was in this way they engaged lower-income families or individuals and contributed to the overall economic development of their service areas.

Figure 17. Programs targeted toward vulnerable populations

Community engagement. When asked about the approximate ratio of attendees in programs or events that came from the NPO service areas, about 10% of the respondents said they got 50% attendees from their service areas, the rest came from other parts of the city or even the suburbs. About 77% of NPOs reported that their events and programs primarily attracted local residents. About 75% to 100% of the attendees attended from their own constituencies. About 13% of NPO correspondents said that they did not know the location of their participants, and that they never asked for this information.
In response to a question about community engagement, “How often does your organization host meetings with community members or stakeholders to plan activities and events?”, about 31% NPOs reported that they hosted such meetings at least once a month. Another 31% said once in six months. It was interesting to see that 14% of these NPOs said that they never had such meetings or never communicated with their constituents in this way. The following graph (see Figure 18) shows the details. Under the “other” category, comments included – “We meet with farmers' market partners for about 10 of our markets, once or twice a year”, “We regularly solicit feedback from community members and former clients”, “Each time we have an event”, and “Sometimes, but not regularly, not enough”. A follow-up question was about the average number of participants in a typical community meeting. Those who reported about hosting such meetings answered this question. About 95% of these meetings had an attendance ranging from 5 to 50 people, depending on the size of the NPOs, the nature of the programs, and the size of their service areas. Only two respondents claimed that they were able to attract up to 100 community participants in such meetings.
The next question was asked about the ways in which NPOs communicated with their constituents. Among the NPOs that used digital communication, 94% of them used it highly or the most frequently. Only 6% had a low use. Among the NPOs that used in-person communication, 71% of them used it highly. These two categories were not mutually exclusive. Few NPOs reported high use of both types of communications. However, there were NPOs that used digital communication more frequently than in-person communication. NPOs also used print media, local newspapers, and other categories such as “events,” “word of mouth,” and “community education workshops.” Details of this finding along with an explanation of the communication types are provided in Table 20.
Table 20

Methods of Communication with Constituents

<table>
<thead>
<tr>
<th>Communication Type</th>
<th>% of NPOs – High Use</th>
<th>% of NPOs – Medium Use</th>
<th>% of NPOs – Low Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Communication*</td>
<td>94%</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>Print Media**</td>
<td>41%</td>
<td>34%</td>
<td>25%</td>
</tr>
<tr>
<td>In-Person Communication***</td>
<td>71%</td>
<td>18%</td>
<td>12%</td>
</tr>
<tr>
<td>Through Local Newspapers</td>
<td>7%</td>
<td>33%</td>
<td>60%</td>
</tr>
<tr>
<td>Other</td>
<td>50%</td>
<td>25%</td>
<td>25%</td>
</tr>
</tbody>
</table>

* Email, social media announcement or message, text message, website announcement, etc.
** Letter, leaflet, newsletter, brochure, poster, etc.
*** Door-to-door outreach, social gathering, phone call, etc.

Note. Percentage calculated out of total responses in one particular category, not all responses in all categories. Total percentage rates differ, because not all NPOs answered in each category and few NPOs reported high use of both types of communications.

There were a few additional questions about digital communication. Most NPOs that used digital communication used email listservs as the primary media. The number of listserv members varied from merely 10 to 25,000. About 93% of these NPOs had either a designated website or a blog site designed as a website. In terms of social media, 91% of them used Facebook; some used Twitter, YouTube and other platforms. In social media, they posted various types of contents and also welcomed contributions from their users or fans. Tables 21 and 22 provide the details.
Table 21

*Types of Content NPOs Usually Shared through Social Media*

<table>
<thead>
<tr>
<th>Content</th>
<th>NPO (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event and program announcement</td>
<td>97%</td>
</tr>
<tr>
<td>Post-event story</td>
<td>70%</td>
</tr>
<tr>
<td>Commentary</td>
<td>48%</td>
</tr>
<tr>
<td>Educational posts</td>
<td>64%</td>
</tr>
<tr>
<td>Politically motivated messages</td>
<td>12%</td>
</tr>
<tr>
<td>Local and national policy tidbits</td>
<td>48%</td>
</tr>
<tr>
<td>Information sharing</td>
<td>82%</td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
</tr>
</tbody>
</table>

Table 22

*Types of Content People Usually Shared through NPO Social Media Platforms*

<table>
<thead>
<tr>
<th>Content</th>
<th>NPO (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program feedback</td>
<td>50%</td>
</tr>
<tr>
<td>Post-event feedback</td>
<td>60%</td>
</tr>
<tr>
<td>Commentary</td>
<td>57%</td>
</tr>
<tr>
<td>Educational posts</td>
<td>33%</td>
</tr>
<tr>
<td>Politically motivated messages</td>
<td>3%</td>
</tr>
<tr>
<td>Local and national policy tidbits</td>
<td>27%</td>
</tr>
<tr>
<td>Information sharing</td>
<td>70%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
</tbody>
</table>

The final question about digital community engagement was “Do users’ comments posted on your website, blog, or social network sites influence the organization’s activities?” Only 38% said yes and they provided some examples:

Winter [h]arvest feedback on food quality, reliability of service; suggestions for vendors at farmers’ markets.

We may alter a product bundle or use a suggested recipe in a promotion that came from a customer.

Product/recipe selection, dietary preferences; Questions asked or issues raised are addressed.
**Organizational Capital Related Variables**

City Harvest [a program of Pennsylvania Horticulture Society – PHS] is powered by partnership. With training from PHS staff, inmates of the Philadelphia Prison System grow seedlings at a prison greenhouse, and thousands more seedlings are started at neighborhood-based greenhouses run by nonprofit partners. The inmates receive training in gardening and basic landscaping along with valuable life-skills lessons. The seedlings are then transplanted and grown in community gardens throughout the city, as well as in the prison’s onsite garden. With facilitation from SHARE (Self Help and Resource Exchange, a food distribution network), the resulting produce is donated to food cupboards, and the Health Promotion Council offers tastings, nutrition workshops, and cooking demonstrations at cupboards and gardens. PHS City Harvest gardeners grow and donate more than 20,000 pounds of produce each year, helping to feed about 1,000 families per week during the growing season, including residents of neighborhoods with some of the highest rates of poverty and food insecurity in the region. (PHS, 2013)

The above example describes the nature and scope of an inter-organizational network between NPOs. Although it is important to understand the role of inter-organizational relationships on the state of food insecurity and vulnerability, the topic is understudied in the realm of food systems research. Here I present an “exploratory” examination of inter-organizational relationships, partnerships, or networks among Philadelphia NPOs that offered food-related programs and events. There were three primarily goals of this analysis: (i) to explore the types of organizational partnerships that exist among food-related NPOs; (ii) to explore whether there is any association between organizational network density and PFIVI scores; and (iii) to explore whether there is any association between bridging/bonding networks and PFIVI scores. Each of these goals is described in the following three sections. Same as Chapters 4, 5, and 6, this analysis addressed place-based questions and thus focused on “spatial” network analysis. Data were collected from my NPO survey and interviews, as well as from online sources, i.e.,
websites, blogs, and social networking sites. This analysis was, in most part, an exploratory study that used mixed methods, including qualitative GIS. Each of the following three sections discusses the methodology in further detail.

**Inter-organizational network**. An organizational network is comprised of relationships or partnerships among organizations. In the NPO survey, presented in the previous section, participant NPO representatives disclosed their nature of relationships or partnerships with other NPOs. The majority (81%) said that they were related to other NPOs because they received funding, such as direct funds, transfer of funds, and subcontracts. The same percentage of NPOs partnered with other NPOs to execute a program or policy. About 67% of NPOs prepared grant proposals in collaboration with other NPOs. More details on the types of partnerships are provided in Table 23.

<table>
<thead>
<tr>
<th>Types of Inter-Organizational Partnerships</th>
<th>% of NPOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received funding (grants, donations, sponsorships, etc)</td>
<td>81%</td>
</tr>
<tr>
<td>Provided funding (grants, donations, sponsorships, etc)</td>
<td>28%</td>
</tr>
<tr>
<td>Wrote grant proposals together</td>
<td>67%</td>
</tr>
<tr>
<td>Executed a program or policy together</td>
<td>81%</td>
</tr>
<tr>
<td>Other</td>
<td>8%</td>
</tr>
</tbody>
</table>

The nature of inter-organizational relationships among different NPOs and other organizations, including government agencies, can be better understood with the help of a few examples drawn from Philadelphia. Out of 153 NPOs, the following four NPOs were chosen from four different planning districts.
Example 1: The Philadelphia Self-Help and Resource Exchange (SHARE), also known as the SHARE Food Program, Inc., established in 1986 and located in the North District, is “a smart idea that brings community and healthy food together” (SHARE, 2013). This organization distributes emergency food relief and also offers food-related education and outreach programs throughout the region. Other programs include an affordable weekly food package program, a low-cost CSA program, and an on-site urban agriculture program. Based on recent data, this organization has partnerships with 22 organizations, including 13 NPO partners. In addition, SHARE has a network of hundreds of food cupboards. The organization offers funds for these cupboards to purchase food from Philabundance, the major regional food bank. The partners can be categorized into the following groups:

- Government offices and agencies – Delaware Valley Regional Planning Commission (DVRPC), Office of Services to the Homeless and Adults, Pennsylvania Department of Agriculture (PADA), and United States Department of Agriculture (USDA)
- Local businesses – Cloud 9 Rooftop Farm
- Religious organizations – Cast Your Cares, Inc.
- Academic institutions – Penn State University Agricultural Extension
- Foundations – Philadelphia Foundation and St. Christopher Foundation for Children
- NPOs – East Park Revitalization Alliance (EPRA) (Lower North District), Grays Ferry Community Garden (University/Southwest District), Greater Philadelphia Coalition Against Hunger (Central District), Inner City Missions Inc. (River Wards District), New Kensington CDC (River Wards District), Nicetown CDC (North District), Norris Square Neighborhood Project (Lower North District), Pennsylvania Association for Sustainable Agriculture (PASA) (outside of Philadelphia), Pennsylvania Horticulture Society (PHS) (Central District), People's Emergency Center (PEC) (University/Southwest District), Philadelphia Orchard Project (University/Southwest District), Philadelphia Urban Food and Fitness Alliance (PUFFA) (Central District), The Enterprise Center CDC (University/Southwest District), and United Way of Southeastern Pennsylvania (Central District)
Example 2: The Mill Creek Farm (MCF), also known as A Little Taste of Everything, is located in the Mill Creek neighborhood of the West District. Started in 2005, the farm site was partially a 25-year old community garden and partially vacant for over 30 years (Mill Creek Farm, 2013). Funds were allocated by the Philadelphia Water Department in partnership with the Pennsylvania Horticultural Society. The MCF has the following partners, including six NPO partners:

- Government agencies – Philadelphia Water Department
- Religious organizations – Broad Street Ministry
- Foundations – Independence Foundation, Patricia Kind Family Foundation, and Philadelphia Foundation
- NPOs – Mariposa Food Co-op (University/Southwest District), Philadelphia Orchard Project (University/Southwest District), Pennsylvania Horticulture Society’s (PHS) City Harvest Program/Philadelphia Community Farming Collaborative (Central District), Preston’s Paradise (West), The Food Trust (Central District), and Urban Nutrition Initiative (UNI) (University/Southwest District).
- Other NPOs (not included in this study) – Neighborhood Bike Works

Example 3: The Southeast Philadelphia Collaborative is located in the South District. The mission of this organization is to coordinate youth and adult partnerships in order to provide and promote youth development and leadership opportunities in Southeast Philadelphia. Food production is one of their youth education and training programs. Established in 1999, the organization serves as the primary network for a diverse group of community partners, policymakers and stakeholders (Southeast Philadelphia Collaborative, 2013). Below is a list of partners; eight among them are NPOs being studied.

- Government agencies – Department of Human Services and Philadelphia Parks and Recreation Department
- Foundations – William Penn Foundation
- NPOs – Fair Food (Central District), Pennsylvania Horticulture Society (PHS) (Central District), Philadelphia Orchard Project (University/Southwest District),
Philadelphia Urban Food and Fitness Alliance (PUFFA) (Central District), Public Interest Law Center of Philadelphia (Central District), The Enterprise Center CDC (University/Southwest District), The Food Trust (Central District), and United Way of Southeastern Pennsylvania (Central District)

- Other NPOs (not included in this study) – Juntos, Eastern North Philadelphia Youth Services Coalition (Congreso), Education Works, and Urban Sustainability Leadership Academy

Example 4: The Pennsylvania Horticultural Society (PHS), founded in 1827 and located in the Central District, offers programs, activities, workshops, and publications for gardeners of all levels and interests. One of their major programs is the City Harvest program, which grows fresh produce for more than 1,000 families in need each week (PHS, 2013). This almost two-century-old organization has a long list of partners, including 36 NPOs being studied.

- Government agencies – USDA
- Foundations – Lenfest Foundation, Merck Family Fund, and Pew Charitable Trusts
- NPOs – African American United Fund (Lower North), Asociacion Puertorriquenos en Marcha (North), Awbury Arboretum Association (Upper Northwest), East Park Revitalization Alliance (EPRA) – (Strawberry Mansion neighborhood – Lower North District), Emerald Street Urban Farm Project (River Wards), Farm 51 (Central Northeast), Fitzwater 2000 Community Garden (Central District), Francisville Neighborhood Development Corporation (Central District), Friends Rehabilitation Program (Lower North), Front Yard (Central District), Greater Philadelphia Coalition Against Hunger (Central), Greening Greenfield (Central District), Keep Philadelphia Beautiful (West Park District), La Finquita (Lower North), Mill Creek Farm/A Little Taste of Everything (West District), Nationalities Service Center (NSC) (Upper North District), Neighborhood Garden Association (NGA), Norris Square Neighborhood Project (Lower North), Penridge Children’s Garden (University/Southwest), Philadelphia Urban Food and Fitness Alliance (PUFFA) (Central District), PhillyEarth (Lower North), Project H.O.M.E. (Central District), Public Interest Law Center of Philadelphia (Central District), Roxborough Presbyterian Community Garden (Lower Northwest), Sloan St Community Garden (University/Southwest), Southeast Philadelphia Collaborative (South), South Kensington Community Partners (Lower North), Summer/Winter Garden (University/Southwest), Teens4Good/Federation of Neighborhood Centers (Central District), The SHARE Food Program (North District), The Spring Gardens (Central District), United Communities Southeast Philadelphia (South), Urban Nutrition Initiative (UNI) (University/Southwest District), Village of Arts and Humanities (Lower North),
Warrington Community Garden (University/Southwest), and Weavers Way Coop (Upper Northwest)
- Other NPOs (not included in this study) – Bartram's Garden, Health Promotions Council, and Philadelphia Cares

As seen in these four examples, NPOs form partnerships with other organizations regardless of their geographic locations or proximity, as long as there is a common interest or a match in their missions. Later in this chapter, I discuss this distance factor more closely. All of these four NPOs have a good number of partners. There are, however, some small-scale NPOs or grassroots organizations that do not have any NPO partners. There are a few organizations that make short-term financial partnerships with other NPOs. These partnerships often are manifested in the form of donations and tools or volunteer exchanges. On the other hand, there are a few organizations that are mostly partnered with big for-profit companies for financial or food donations. Regardless of these factors, it is evident from this analysis that most NPOs are partnered with not only other NPOs, but also with the government and for-profit organizations.

*Spatial network analysis.* The organizational network can be presented graphically as nodes – representing organizations, and connecting lines – representing the existence of relationships or partnerships between them. Figure 19, as an example, is a conceptual diagram showing connections among various types of nonprofits, government, and for-profit organizations that are focused on hunger relief operations. This example demonstrates that the scope of inter-organizational network connections is broad and it includes both vertical and horizontal partners from various sectors. This study, however, is limited to only horizontal organizational networks.
Figure 19. Conceptual network. Connections among various types of nonprofits, government, and for-profit organizations that are focused on hunger relief operations.

Data on connections or partnerships were collected for 153 NPOs. As mentioned before, the NPO survey reached out to 147 NPOs and yielded responses from representatives of 116 NPOs. Also mentioned before, not all responses were complete. About 18% of the NPOs who responded to the survey did not answer questions about partnerships with other NPOs. The survey had five questions asking about different types of partnerships. I collected partnership data for the rest of NPOs (either the remaining respondents of the survey or NPOs that did not participate in the survey at all) through online search. All of these NPOs had some kind of Internet presence – either a website, blog site, Facebook page, or other types of platforms. Generally, NPOs reported their
partnering organizations’ names, sometimes with enough details. It was easy to record the partnering organizations’ names and locations, but types of partnerships were not always specified (i.e., financial partnership, working partnership, or something else). So, I did not categorize those partnership types in this analysis.

Visualizing network connections of all NPOs was one of the most challenging and time-consuming tasks of this study. A number of software packages are available to display “relative” network connections among actors, either individuals or organizations. But visualization of networks tied with geographic locations cannot be easily done with existing available software. In particular, such tools, packages, or extensions are yet unavailable in the GIS environment. My personal contact with a few staff members of a leading GIS software company and a few academic researchers specialized in qualitative GIS confirmed this finding. So, after collecting data on partnerships between all the NPOs, a student under my supervision manually drew these network connections using AutoCAD software, as AutoCAD has better functionality in terms of drawing new features. This drawing process was done on top of a scaled map of Philadelphia.

Finally, I created two types of maps. Figure 20 shows NPOs with all types of partners, government, institutional (religious or academic), and other NPOs that were not part of this study. The straight or curve nature of line connections had no bearing on the significance or types of connections; they were chosen according to the easiness or clarity of drawing. Figure 21 displays only selected partners – NPOs that were included in this study. In this sense, the second figure shows the inter-organizational relationships that I wanted to study in detail. Here I used only straight line connections. Both maps used the
actual locations of NPOs or other organizations. As seen in both maps, NPOs were concentrated toward the center of the city, so naturally the central areas had a higher presence of network connection lines. Out of 153 NPOs being studied, 38 did not report any partners.

A visual inspection gives an impression of a dense network in many parts of the city. The network is spread throughout the whole city, not concentrated in some smaller “network neighborhoods”, as illustrated by Hipp et al. (2012). This visual impression, however, needs further exploration. The following section will examine the network density of these organizations.

Density of network. Network density refers to the total number of connections between organizations in a network divided by the total number of possible connections. The calculation follows this formula: Density (D) = Actual connections / Maximum possible connections (C). An ideal, fully-connected network is supposed to have a density of 1.00. Only one type of connection was considered in this study. As explained before, classified partnership data were available only for selected NPOs being studied, and therefore were not used in this density calculation.

This analysis was based on an assumption that the partnerships or relationships between NPOs were of equal value in both directions - that is, organization A interacted with organization B at the same level of intensity as B interacted with A. The formula for the maximum possible connections in a fully-saturated network is, C (connection) = N (N-1)/2. Out of 153 NPOs, 38 did not have any partner or at least any such information was not available via Internet search. That left 115 NPOs that had at least one partner.
Figure 20. Organizational network of food-related NPOs and their partners. Partners included government offices or agencies, nonprofit institutions (academic or religious), NPOs that had food-related programs, and other types of NPOs.
Figure 21. Organizational network of food-related NPOs. Here partners share similar agenda.

With 115 nodes (N = 115), there were 115 × 114 = 13,110 possible interactions, therefore 13110/2 = 6,555 maximum possible connections. Finally, network density (D) was calculated for each NPO, ranging from 0 to 42 relationships per NPO, and then aggregated at the planning district level by taking the mean value. The results are shown...
in Table 24. A higher rank of a planning district meant the district had a higher level of “mean” network density. The table also has a column showing PFIVI ranks of all planning districts, as calculated in Chapter 4.

<table>
<thead>
<tr>
<th>Planning District Name</th>
<th>Density (D)</th>
<th>Rank *</th>
<th>PFIVI Rank **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>0.0311</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>Central Northeast</td>
<td>0.0002</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Lower Far Northeast</td>
<td>0.0000</td>
<td>1.5</td>
<td>5</td>
</tr>
<tr>
<td>Lower North</td>
<td>0.0052</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Lower Northeast</td>
<td>0.0002</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Lower Northwest</td>
<td>0.0011</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Lower South</td>
<td>0.0015</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Lower Southwest</td>
<td>0.0004</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>North</td>
<td>0.0046</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>North Delaware</td>
<td>0.0000</td>
<td>1.5</td>
<td>10</td>
</tr>
<tr>
<td>River Wards</td>
<td>0.0017</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>South</td>
<td>0.0051</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>University/Southwest</td>
<td>0.0131</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Upper Far Northeast</td>
<td>0.0003</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Upper North</td>
<td>0.0004</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Upper Northwest</td>
<td>0.0035</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>West</td>
<td>0.0018</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>West Park</td>
<td>0.0009</td>
<td>8</td>
<td>11</td>
</tr>
</tbody>
</table>

* This is ranked from 1 to 18, with 1 having the least amount of connections and 18 having the highest amount of connections.

** PFIVI ranked from 1 to 18, with 1 having the lowest food insecurity/vulnerability and 18 having the highest food insecurity/vulnerability.

As observed in the above table, the Central district had the maximum number of NPOs that had higher values of network density, created through partnerships with other NPOs throughout the city. The University/Southwest district ranked closely behind the Central district and two districts – Lower North and South – jointly secured the third position. In order to do a comparison with PFIVI score, I overlaid PFIVI ranks and
Density ranks of planning districts in one map. Figure 22 shows all the planning districts and their PFIVI ranks (in black color) and Density ranks (in blue color).

![Map of planning districts with ranks](image)

Figure 22. Planning districts and their PFIVI and network density ranks. Shown in black and blue color respectively.

As seen in the Figure 22, several districts such as University/Southwest, West, Lower North, and Lower Southwest districts had similar types of rankings at the both scales. On the contrary, density ranks did not match with PFIVI ranks in a number of districts. For example, Central district’s PFIVI score was very low (2 out of 18), but
Density score was the highest (18 out of 18). Similarly, Upper Northwest district had a low PFIVI score (3), but high Density score (13). North and River Wards districts’ PFIVI scores were very high (17 and 16 respectively), but their Density score was medium (14 and 11 respectively). A similar mismatch pattern was visible in the rest of the districts. So, what do these numbers mean? No distinct pattern of PFIVI and density scores was found throughout the city. Some planning districts that faced a high level of food insecurity and vulnerability had strong, medium, or even weak organizational networks of food-focused NPOs.

The density of networks usually goes down as the size of the group increases, for example the maximum density will never be greater than 0.5 for a network that has a few hundred nodes. Network density, especially aggregated at a geographic unit, can provide only a rough idea of inter-connectedness; it cannot be used to determine the actual group performance of the participant organizations. The above findings can generate interesting questions about the inferences that can be drawn from the structural shape of organizational networks and the optimal size for a functional organizational network.

**Bridging and bonding network.** I tested “spatial” bridging and bonding networks of all the 153 NPOs being studied. When an NPO was connected to another NPO in the same district, the network was termed as a bonding network and when connected to an NPO of another district, the network was termed as a bridging network. The purpose was to examine which districts had more NPOs with bridging or bonding networks and whether there was any connection with the PFIVI scores of those districts. The calculation was done for each NPO located in each planning district. As reported before,
almost half the NPOs being studied considered the whole city or even the region as their service areas. I included those NPOs in this network analysis, because having a big service area does not necessarily guarantee a balanced spatial distribution of NPO partnerships and food-related projects. According to my initial screening, many NPOs that claimed to have city-wide service areas did not have projects or NPO partnerships all over the city. I wanted to analyze this pattern.

According to this analysis, NPOs generally had more bridging partners than bonding. As seen in Table 25, 85 NPOs had 0 bonding partner, 43 NPOs had only 1 bonding partner each, 15 NPOs had 2 partners each, and the remaining 10 NPOs had 3 or more bonding partners each. All of these NPOs with 3 or more bonding partners were located in the Central district. On the other hand, 54 NPOs had 0 bridging partners, 41 NPOs had only 1 bridging partner each, 16 NPOs had 2 partners each, and the remaining 42 NPOs had 3 or more bridging partners each. NPOs with higher numbers of bridging partners were also located in the Central district.

<table>
<thead>
<tr>
<th>Table 25</th>
<th>NPOs and their Bridging and Bonding Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Partners</td>
</tr>
<tr>
<td>NPOs According to Partnership Types</td>
<td>Zero</td>
</tr>
<tr>
<td>Total NPOs with Bonding Partners</td>
<td>85</td>
</tr>
<tr>
<td>Total NPOs with Bridging Partners</td>
<td>54</td>
</tr>
</tbody>
</table>

In order to understand what is going on behind these numbers, I explored the networks of a number of NPOs in detail. Four of these examples are described below. These are the same four cases that were presented before in the organizational network.
section of this chapter. The ultimate goal of this analysis was to understand whether
NPOs and their bridging or bonding networks had any spatial connections with the PFIVI
ranks of planning districts. The questions needed to be explored are as follows: Do
planning districts with higher PFIVI scores contain NPOs that have higher or lower levels
of bridging or bonding networks? What is the mean distance of these bridging/bonding
partners’ locations? I used GIS to explore and visualize these questions. The Origin-
Destination Matrix tool available in ArcGIS Network Analyst Extension was used to
locate these NPOs and their bridging or bonding partners, display network connections
and directions, and calculate the length (geodesic distance) of each network.

Example 1: As mentioned before, the SHARE Food Program had partnerships
with 22 organizations, including 13 NPOs, one of which was located outside of the city
boundary. As seen in Figure 23, and also in the Table 26, there was only one bonding
partner – an NPO located in the same planning district as SHARE, i.e., the North District.
Two partners were located in adjacent district Lower North. The rest of the partners were
located in Central, River Ward, and University/Southwest Districts. The NPO partners
were located as close as 1.5 miles or as far as about five miles. It was interesting to see
only a few partners in North or Lower North districts and none in other adjacent districts,
such as Upper Northwest and Upper North Districts. The minimum length of a
connection was 1.47 miles, maximum length 4.69 miles, and mean length 3.13 miles.
Figure 23. SHARE Food Program (circle) and its partners (squares).

Table 26

<table>
<thead>
<tr>
<th>Partnership Name</th>
<th>Length (Mi)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHARE – Nicetown CDC</td>
<td>1.47</td>
<td>1</td>
</tr>
<tr>
<td>SHARE – East Park Revitalization Alliance</td>
<td>1.61</td>
<td>2</td>
</tr>
<tr>
<td>SHARE - Greater Philadelphia Coalition Against Hunger</td>
<td>2.74</td>
<td>3</td>
</tr>
<tr>
<td>SHARE - Norris Square Neighborhood Project</td>
<td>2.81</td>
<td>4</td>
</tr>
<tr>
<td>SHARE – Inner City Mission Inc.</td>
<td>2.93</td>
<td>5</td>
</tr>
<tr>
<td>SHARE – New Kensington CDC</td>
<td>3.14</td>
<td>6</td>
</tr>
<tr>
<td>SHARE – Peoples Emergency Center</td>
<td>3.35</td>
<td>7</td>
</tr>
<tr>
<td>SHARE – United Way of Southeastern Pennsylvania</td>
<td>3.49</td>
<td>8</td>
</tr>
<tr>
<td>SHARE – Pennsylvania Horticulture Society</td>
<td>3.49</td>
<td>9</td>
</tr>
<tr>
<td>SHARE - The Enterprise Center CDC</td>
<td>3.80</td>
<td>10</td>
</tr>
<tr>
<td>SHARE - Philadelphia Urban Food and Fitness Alliance</td>
<td>4.09</td>
<td>11</td>
</tr>
<tr>
<td>SHARE - Grays Ferry Community Garden</td>
<td>4.69</td>
<td>12</td>
</tr>
</tbody>
</table>
Example 2: The Mill Creek Farm in West District had 11 partners, six of which were NPOs that were being studied. Among these six, there was only one bonding partner, and the rest were bridging partners – three in the adjacent district University/Southwest, and the other two in Central district. The minimum length of a connection was 0.78 miles, maximum length 2.87 miles, and mean length 1.67 miles.

Figure 24 and Table 27 show visual representation of bridging and bonding partners and length of connections respectively.

Figure 24. Mill Creek Farm (circle) and its partners (squares).
Table 27

*Network Distance – Mill Creek Farm and Its Partners*

<table>
<thead>
<tr>
<th>Partnership Name</th>
<th>Length (Mi)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mill Creek Farm - Preston's Paradise</td>
<td>0.78</td>
<td>1</td>
</tr>
<tr>
<td>Mill Creek Farm - Philadelphia Orchard Project</td>
<td>1.04</td>
<td>2</td>
</tr>
<tr>
<td>Mill Creek Farm – Mariposa Food Co-op</td>
<td>1.24</td>
<td>3</td>
</tr>
<tr>
<td>Mill Creek Farm - Urban Nutrition Initiative</td>
<td>1.56</td>
<td>4</td>
</tr>
<tr>
<td>Mill Creek Farm - Pennsylvania Horticulture Society</td>
<td>2.53</td>
<td>5</td>
</tr>
<tr>
<td>Mill Creek Farm - The Food Trust</td>
<td>2.87</td>
<td>6</td>
</tr>
</tbody>
</table>

Example 3: Southeast Philadelphia Collaborative, which was located in the South District, had 8 NPO partners out of a total 16 partners. As seen in the Figure 25 and Table 28, this organization did not have bonding partner. All partners were located in two adjacent districts – Central and University/Southwest, with majority in the Central district. The minimum length of a connection was 1.67 miles, maximum length 3.85 miles, and mean length 2.52 miles.

![Figure 25. Southeast Philadelphia Collaborative (circle) and its partners (squares).](image-url)
Table 28

Network Distance – Southeast Philadelphia Collaborative and Its Partners

<table>
<thead>
<tr>
<th>Partnership Name</th>
<th>Length (Mi)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative - Philadelphia Urban Food and Fitness Alliance</td>
<td>1.69</td>
<td>1</td>
</tr>
<tr>
<td>Collaborative - Fair Food</td>
<td>1.79</td>
<td>2</td>
</tr>
<tr>
<td>Collaborative - The Food Trust</td>
<td>2.15</td>
<td>3</td>
</tr>
<tr>
<td>Collaborative - United Way of Southeastern Pennsylvania</td>
<td>2.31</td>
<td>4</td>
</tr>
<tr>
<td>Collaborative - Public Interest Law Center of Philadelphia</td>
<td>2.32</td>
<td>5</td>
</tr>
<tr>
<td>Collaborative - Pennsylvania Horticulture Society</td>
<td>2.35</td>
<td>6</td>
</tr>
<tr>
<td>Collaborative - Philadelphia Orchard Project</td>
<td>3.85</td>
<td>7</td>
</tr>
<tr>
<td>Collaborative - The Enterprise Center CDC</td>
<td>3.74</td>
<td>8</td>
</tr>
</tbody>
</table>

Example 4: PHS is one of the larger and oldest nonprofit organizations in the Philadelphia region, located in the Central District. Overall, PHS had about 43 partners for their tree planting and gardening related programs, including food producing and ornamental gardening. Among them, 36 NPOs were being studies in this analysis. It can be interpreted from Figure 26 and Table 29, 11 NPOs were bonding partners and the remaining 25 were bridging partners, located in 11 different planning districts throughout the city. This was one of the richest and densest networks visible in the city. In terms of network lengths, the minimum length was 0 (NPOs located in the same building), maximum 10 miles, and mean value was 2.66 miles.
Figure 26. PHS (circle) and its partners (squares).

<table>
<thead>
<tr>
<th>Partnership Name</th>
<th>Length (Mi)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHS - Neighborhood Garden Association</td>
<td>0.00</td>
<td>1</td>
</tr>
<tr>
<td>PHS - Public Interest Law Center of Philadelphia</td>
<td>0.21</td>
<td>2</td>
</tr>
<tr>
<td>PHS - Greening Greenfield- Agricultural Zone</td>
<td>0.33</td>
<td>3</td>
</tr>
<tr>
<td>PHS - Philadelphia Urban Food and Fitness Alliance</td>
<td>0.71</td>
<td>4</td>
</tr>
<tr>
<td>PHS - The Spring Gardens</td>
<td>0.77</td>
<td>5</td>
</tr>
<tr>
<td>PHS - Greater Philadelphia Coalition Against Hunger</td>
<td>0.87</td>
<td>6</td>
</tr>
<tr>
<td>PHS - Fitzwater 2000 Community Garden</td>
<td>0.89</td>
<td>7</td>
</tr>
<tr>
<td>PHS - Summer/Winter Garden</td>
<td>0.90</td>
<td>8</td>
</tr>
<tr>
<td>PHS - Project H.O.M.E.</td>
<td>0.96</td>
<td>9</td>
</tr>
</tbody>
</table>
NPOs did not choose any specific geographic boundaries when they choose a partner – either bridging or bonding. I have tested this theory against a number of boundary types such as planning districts, NPO service areas, zip codes, and census tracts. When considering all 153 NPOs in the city, the majority of network lengths were in the range of 2 to 5 miles. But it is clear that geographic distance does not usually

<table>
<thead>
<tr>
<th>Partnership Name</th>
<th>Length (Mi)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHS - Francisville Neighborhood Development Corp.</td>
<td>1.07</td>
<td>10</td>
</tr>
<tr>
<td>PHS - Urban Nutrition Initiative</td>
<td>1.13</td>
<td>11</td>
</tr>
<tr>
<td>PHS - The Federation of Neighborhood Centers</td>
<td>1.46</td>
<td>12</td>
</tr>
<tr>
<td>PHS - Sloan St Community Garden</td>
<td>1.53</td>
<td>13</td>
</tr>
<tr>
<td>PHS - Friends Rehabilitation Program</td>
<td>1.67</td>
<td>14</td>
</tr>
<tr>
<td>PHS - Front Yard</td>
<td>1.80</td>
<td>15</td>
</tr>
<tr>
<td>PHS - La Finquita</td>
<td>1.94</td>
<td>16</td>
</tr>
<tr>
<td>PHS - South Kensington Community Partners</td>
<td>2.08</td>
<td>17</td>
</tr>
<tr>
<td>PHS - East Park Revitalization Alliance</td>
<td>2.11</td>
<td>18</td>
</tr>
<tr>
<td>PHS - United Communities Southeast Philadelphia</td>
<td>2.30</td>
<td>19</td>
</tr>
<tr>
<td>PHS - African American United Fund</td>
<td>2.33</td>
<td>20</td>
</tr>
<tr>
<td>PHS - Southeast Philadelphia Collaborative</td>
<td>2.33</td>
<td>21</td>
</tr>
<tr>
<td>PHS - Warrington Community Garden</td>
<td>2.39</td>
<td>22</td>
</tr>
<tr>
<td>PHS - Mill Creek Farm/ A Little Taste of Everything</td>
<td>2.54</td>
<td>23</td>
</tr>
<tr>
<td>PHS - Pentridge Children's Garden</td>
<td>2.64</td>
<td>24</td>
</tr>
<tr>
<td>PHS - Village of Arts and Humanities</td>
<td>2.70</td>
<td>25</td>
</tr>
<tr>
<td>PHS - PhillyEarth</td>
<td>2.72</td>
<td>26</td>
</tr>
<tr>
<td>PHS - Norris Square Neighborhood Project</td>
<td>2.79</td>
<td>27</td>
</tr>
<tr>
<td>PHS - Emerald Street Urban Farm Project</td>
<td>2.95</td>
<td>28</td>
</tr>
<tr>
<td>PHS - The SHARE Food Program</td>
<td>3.49</td>
<td>29</td>
</tr>
<tr>
<td>PHS - Asociacion Puertorriquenos En Marcha</td>
<td>4.75</td>
<td>30</td>
</tr>
<tr>
<td>PHS - Nationalities Senior Center</td>
<td>5.14</td>
<td>31</td>
</tr>
<tr>
<td>PHS - Keep Philadelphia Beautiful</td>
<td>5.32</td>
<td>32</td>
</tr>
<tr>
<td>PHS - Awbury Arboretum</td>
<td>6.36</td>
<td>33</td>
</tr>
<tr>
<td>PHS - Weavers Way Cooperative Association</td>
<td>6.42</td>
<td>34</td>
</tr>
<tr>
<td>PHS - Roxborough Presbyterian Community Garden</td>
<td>7.91</td>
<td>35</td>
</tr>
<tr>
<td>PHS - Farm 51</td>
<td>10.11</td>
<td>36</td>
</tr>
</tbody>
</table>
influence organizational network directly. A few networks even went beyond the city limit, expanding to the inner-ring suburbs, rural Pennsylvania, and even New Jersey. Since most larger and issue-based NPOs were located in the Central district, place-based NPOs from many different parts of the city were usually connected with them, regardless of their distances. As one NPO representative explained –

We make partnerships with [other NPOs] when there is a match… either there is a common interest, a common grant proposal, or a common project… yes, distance does matter, it’s always great to have a partner in the same neighborhood, but we look for more than that… say “power”. [NPOs] in the center city… they have the political and economic power to make things happen. You need to partner with them and get involved with the bigger plans. We need [a] continuous funding stream. Partnering with [NPOs with “power”] makes more sense [compared to] partnering with a small organization in your neighborhood that may not even last more than a year. (An interviewee from West Philadelphia District)

Observations on the Ground

Between 2010 and 2012, I attended about 25 food-related events, tours, forums, and community or stakeholder meetings, organized by NPOs in Philadelphia. While a reflection on this participation will be a topic for another future study, I provide my basic observations here. Most programs or events open to the stakeholders primarily were hosted or attended by selected NPOs. With a few exceptions, these were the most visible NPOs in the city, regularly featured in the print or Internet media, interviewed by researchers and students from various universities, and invited to the policy making process by the city or other government agencies. Many smaller NPOs, although working hard on the ground and in their own neighborhoods, sometimes did not get the attention
that they needed to promote their programs, make new partners, or attract new volunteers.

A couple of NPO representatives shared similar observations:

Yes, [we are a] small organization. We care about food access issues and we are trying our best to bring some positive changes in the neighborhood landscape with the help of volunteers and community participants. Yes, partnerships are good, but as long as there is a common focus on the issues [of our own neighborhood]. We tried to participate in bigger forums and what not… they discuss issues from city or regional perspectives. It’s all good, but we wanna be focused on our neighborhood for now. Yes, we don’t get much visibility, attention, or news coverage, and that is okay as long as we are able to function. (An interviewee from North District)

On the other hand, another NPO representative raised the issue of insecurity or inconsistency in an established network.

It’s great to be a part of a big, visible network, but we need to make sure smaller NPOs can survive without the help or dependency from bigger [NPOs]. In recent times we have seen that [some] long-term [programs] are being discontinued due to lack of funding or the change in administration in a foundation. What if an [NPO] is being unplugged from the system? What would happen to the [organizational] network? If two or three actors are thrown out of an established network, will the [network] safety net work? The [network] graph of NPOs is not monolithic – there will be rises and falls. (An interviewee from University/Southwest District)

All types of NPOs participated in this study faced a number of challenges. Most NPOs commented that the key challenges that they faced were related to financial matters. Other challenges were related to operational, organizational, land ownership, and leasing issues. A few quotes are included below. Some of these recall the issues and challenges discussed in Chapters 5 and 6.

[The challenges are] economic, organizational, operational”, “staff capacity, program evaluation”, “crime”, “outreach to diverse populations”, “collaborating with the right community partners to ensure long-term success”, “land use, obtaining permission, water access [for urban agriculture]”, “political roadblocks or bad policy”, “clarity of mission and criteria for eligibility [for grant applications].
[The challenge is] getting the message out about our programs; some operational limitations due to budget; with larger budget we would put more into educating the public on the value of buying local.

[The challenge is] engaging neighbors/volunteers in regular program decision-making and organizational development.

[The main challenge is] organizational - we are a group of volunteers, so delegation of tasks, accountability, roles, & responsibilities are hard to tie down, & often the burden of "unattractive" but necessary activities for progress fall on too few people.

[The key challenge is] the lack of organized urban agriculture constituency in Philadelphia, resource scarcity influencing organization's unwillingness to collaborate, unwillingness of City Administration to fully recognize the value of urban agriculture in Philadelphia.

Conclusion

I have discussed in this chapter the work of NPOs offering food-based programs and events that were tied with community capacity building and community development efforts. Like previous chapters, this discussion was focused on spatial or place-based analysis, with a focus on food insecure and vulnerable populations. Based on a city-wide NPO survey and interviews with NPO representatives, NPO programs and events were assessed and compared with PFIVI scores. Additional analysis was done on inter-organizational networks and their relationships with PFIVI scores.

As I found out, NPO programs and events did not have spatial mismatch issues with PFIVI scores in many areas of the city. This finding partially confirmed my initial assumption that NPOs initiated community development and capacity building activities through food-focused programs more vigorously (with higher levels of services) in areas with higher PFIVI scores. A number of initiatives and programs were particularly
designed to assist lower-income populations. For example, about two-thirds of the organizations that had any produce-selling programs accepted either one or more types of government assistance cards (i.e., EBT, WIC). Again, about one-third of the NPOs that participated in this survey reported that at least \( \frac{3}{4} \) of their programs, if not all, were targeted toward vulnerable or disadvantaged populations (i.e., older adults, lower-income, minority, refugees, ethnic groups, and minority religious groups). These findings, however, were not consistent throughout the whole city, and some areas with lower PFIVI scores did not have such offerings. This study only partially confirmed the other assumption that areas with higher PFIVI scores generally were targeted by a higher number of NPOs that had a higher organizational network density. Spatial mismatch issue was observed in a number of planning districts.

Establishing relationships between PFIVI scores and NPO programs and events was not a straight-forward task and it needed thorough investigations of a number of related matters. As found in the survey, almost half of the NPOs participated in this survey had community economic development and/or community capacity building as part of their missions. More than half of these NPOs were literally community-based, with designated service areas. Generally, NPOs offered programs and events targeted toward people from their surrounding neighborhoods, as well as people from all over the city. However, it was difficult for the NPOs to keep track of their participants’ locations. Many NPOs could not answer the questions on participation because of a lack of data. There were NPOs in the city whose programs and events attracted more people outside of their immediate service areas, so the mere presence of such programs and events in areas
with high PFIVI scores did not necessarily mean that they contributed toward local community development or capacity building efforts.

Although various “indirect” benefits of food-related programs and events were found, the “direct” contribution of these programs to the economic development was somewhat limited. Most jobs created through these programs were not permanent, not full-time, not well-paid, and did not offer any fringe benefits. The economic development aspect of food-related research will be one of the key research agendas in the near future. Not much data on this topic were available, and the response rate for this question in my survey was also among the lowest.

Although most NPOs appreciated feedback on their programs and events from neighborhood stakeholders or residents, they did not necessarily involve them or incorporate this feedback into their decision-making process. Community meetings targeted toward the participation and engagement of local residents were not offered often and on a regular basis. NPOs usually received feedback through social media, email, or other tools only after the events or programs were over. Although soliciting comments or ideas before a program or event could be more useful or effective, many NPOs claimed that they could not attract many participants even though they offered such community meetings. On the other hand, in the event that feedback was provided by the residents and stakeholders, only a few NPOs were able to incorporate those comments in the planning process of future events. Lack of clarity or usefulness of the suggestions was a key concern.
In terms of civic engagement tools, a significant 94% of NPOs heavily used digital tools to communicate with their constituents. It was surprising to see that digital methods were used at a higher level than in-person communication methods. Community development and community capacity building efforts typically are conceived to be people-oriented tasks where in-person communication tools would be heavily used. This might be a good approach to attract the major clientele group of these programs and events, the majority of whom were young and tech-savvy people. However, considering the fact that a good portion of the NPOs’ programs were targeted toward the disadvantaged population, the question of the impact of any “digital divide” would arise.

As seen in Chapter 4, many lower-income and elderly residents in Philadelphia have limited or no access to the Internet and thus cannot be part of such outreach efforts (also see Meenar & Hoover, 2012).

The organizational network analysis helped us understand the following types of questions. Do partnerships matter for the NPOs? Which NPOs can be treated as desired partners? Do they make partnerships within their immediate service areas? The analysis showed that 38 NPOs, including many small-scale NPOs or grassroots organizations, had no partners at all. Some NPOs had only short-term financial partnerships with other NPOs. These partnerships were often manifested in the form of donations, tools, or volunteer exchanges. On the other hand, there were a few organizations that were mostly partnered with large, for-profit companies for financial or food donations.

Although the network connectivity map showed a dense organizational network in Philadelphia, actual density values of all these NPOs were very low and sometimes
spatially misplaced. For example, NPOs located in the Central district had the highest network density, although the district’s PFIVI score was one of the lowest. Comparing PFIVI scores and density scores of all the NPOs in each planning district did not show a consistent relationship pattern throughout the city. It was evident that the density calculation, especially aggregated at a geographic unit, did not offer the complete picture of the network, as it could not determine the actual group performance of the participant organizations. This finding could lead into new research questions which will be discussed in the concluding chapter.

Philadelphia NPOs generally had more bridging partners than bonding. The majority of organizational network lengths were in the range of 2 to 5 miles. Some interviewees suggested that NPOs did not necessarily consider any specific geographic boundaries when they chose a partner. In terms of partnerships, most of them looked for common interests or agendas, financial standing, and political connections. This tendency led to a particular pattern in the city – the most visible NPOs were the ones that made partnerships with larger NPOs, were featured in the media, and were invited into the policy-making process. On the contrary, many smaller NPOs, although working hard on the ground and in their own neighborhoods, sometimes did not get similar attention.

Next Chapter

As the concluding chapter, Chapter 8 offers a summary of the findings and discusses the literary and methodological contributions of this study. It also provides a list of new research questions or possible future studies related to this one.
CHAPTER 8
ASSESSING THE ROLE OF NPOS

This concluding chapter has four sections: a summary of key findings from the five sets of research questions that I asked in this dissertation; a discussion on the contribution of this work to theory, methods, practice, and policy; a recap of study limitations with a proposal for a future research agenda; and my concluding remarks on the role of NPOs in addressing food justice issues.

Summary of Key Findings

Question Set 1:

Using a food justice framework, how do we comprehensively measure community food insecurity and vulnerability at a local level, such as a census tract or a neighborhood? What indicators and variables should we consider and why? How can we create a place-based food insecurity index and apply it at the urban neighborhood level?

A food justice theoretical framework allowed me to comprehensively measure community food insecurity and vulnerability within the context of lower-income neighborhoods of post-industrial US cities. This understanding was not limited to only different types of food access (i.e., geographic, economic, informational, social, and cultural), but also included different types of CFS-related concepts such as hunger, food hardship, food safety, nutritional value, food consumption habit, diet-related food choices, and vulnerable populations and places. A broader understanding of the concept
of food justice was considered necessary to assess disadvantaged urban food environments and the needs for appropriate interventions.

I developed a *Place-Based Food Insecurity and Vulnerability Index (PFIVI)*, which factored together 33 variables to measure six indicators: hunger and food hardship, low food access, poor food habit, poor health condition, lower community engagement, and at-risk population and places. In order to apply the quantitative and qualitative understanding of the problem, I used mixed methods, including a qualitative GIS approach, which allowed me to include stakeholders’ comments and suggestions directly in the PFIVI model, both in selecting the indicators and variables and assigning their weights in the GIS-based raster overlay analysis. After applying the PFIVI index for the City of Philadelphia, I found that about 48% of Philadelphia census tracts were assigned a higher PFIVI score. About 50% or more areas within several planning districts scored the highest PFIVI rankings, including North, Lower North, Upper North, Lower Northeast, River Wards, West, University/Southwest, and South. The results were totally or partially different from other Philadelphia-based food access study outputs (TRF, 2012; USDA, 2012; City of Philadelphia, 2012), because a number of variables used in this index were not considered in those studies. Without using this index, it wouldn’t be possible to identify a number of neighborhoods as food insecure or vulnerable.

The PFIVI index, which offers a comprehensive understanding of place-based food insecurity and vulnerability, can contribute to both theory and practice. NPOs with on-the-ground projects may use PFIVI index outputs to select locations for future projects. Most urban neighborhoods are unique in their racial-socio-economic-ethnic
terms; different types of programs may fit better in different types of neighborhoods. Since context is a key factor, other communities interested in replicating this study should adjust the data layers and their weights based on their local context, local needs, and local conditions. As long as other communities agree with the suggested comprehensive understanding of the food insecurity issues from a food justice point of view, they can modify the PFIVI index in a GIS environment, with somewhat different types of variables or other data layers.

**Question Set 2**

What are the dynamics of place-based charity food programs or street-level food assistance programs to combat food insecurity and vulnerability? Do these programs address the needs of the food insecure or hungry population? Is there any service gap or other operational challenges? Do the NPOs intervene where there are the greatest needs?

Following similar methodologies used for the PFIVI index, a RELIEF index was developed to assign ordinal ranks to places, based on their levels of NPO-driven food assistance programs, such as food banks, food cupboards, and soup kitchens. Results showed about 47% of Philadelphia census tracts had low accessibility to hunger relief services; and planning districts such as Lower North, University/Southwest, West, and Central had higher access. Three types of statistical tests were administered to analyze the relationships between HUNGER and RELIEF variables. According to the results of the Chi-Square test, RELIEF was strongly associated with HUNGER. The Gamma test showed that there was a positive but moderate relationship between those two variables.
According to Spearman's rho test, there was a positive and direct but moderately strong correlation between them.

This analysis demonstrates that although NPO-driven RELIEF programs are generally located in areas with higher HUNGER scores, spatial mismatch does exist in Philadelphia. There are a number of planning districts, including the North, with higher HUNGER scores that are not easily accessible to any hunger relief agencies. On the other hand, districts, including the Central, have lower HUNGER scores but higher RELIEF scores.

Besides the spatial mismatch issue, hunger relief-NPOs face other issues such as low operational capacity, inadequate resources, little or no informational and analytical support, poor record keeping practices, and low economic support. The lack of inter-agency cooperation and coordination decreases the level of efficiency of their services (such as locations or operating hours), which also results in inconsistent distribution of food items in hunger relief agencies located in different neighborhoods. While most street-level food assistance agencies can distribute only canned food and other types of dry food without much nutrition value, a number of agencies have become interested in fresh food collection and distribution, although availability of such items is not always guaranteed, even during the height of the production season. These findings are consistent with other research in this topic (Companion, 2010; Meenar, 2012).
Question Set 3

How do NPOs address food access issues by providing convenient access to healthy and affordable food through alternative food outlets? Do the NPOs intervene where there are the greatest needs? Is there a common spatial pattern throughout the city?

An ALTFOOD index was developed to assign ranks to places, based on their convenient access to NPO-driven alternative food programs, including community gardens, farmers markets, CSAs, co-ops, and healthy corner stores. Based on my findings, about 37% of Philadelphia census tracts had high accessibility to these programs or outlets. Four planning districts – Lower North, University/Southwest, West, and Central – had high ALTFOOD scores, whereas two districts – Upper Far Northeast and Lower South – secured the lowest scores. According to statistical tests, ALFOOD and LOWACCESS variables had a strong and positive relationship, which means that NPOs generally offer alternative food programs more frequently and densely in areas with low access to healthy, fresh, and affordable food.

Although no statistically significant spatial mismatch issue is observed between LOWACCESS and ALTFOOD, these NPO-run programs generally face financial and operational challenges that sometimes affect the management, continuity, consistency, and quality of these said programs. Support from local governments and policymakers, if any, is inconsistent and at times contradictory. Community buy-in is an issue faced by some programs in many neighborhoods. Some programs are criticized for not being consistent in quality, not being affordable, or not being available year-round. The economic contributions of some programs are unclear or understudied. Most importantly,
there are debates associated with some programs for their social or racial exclusion, for being run by White, young people in predominantly Black or other racial minority places, for following a top-down approach, and for serving primarily high-income, White customers.

The findings from this research, which used Philadelphia as the study location, agrees with the arguments made by Alkon & Agyeman (2011, p. 333-34) that typical urban food movement is overwhelmingly “White,” but the food justice framework provides an alternative to such colorblindness. This research also confirms with Alkon & Agyeman (2011) that minority race/ethnic population groups, inspired by the food justice movement, create their small Latino/a spaces, Black spaces, or immigrant spaces in an urban area, and grow crops, fruits, and vegetables associated with their racial or ethnic identity.

**Question Set 4**

How do NPOs address food insecurity and vulnerability through their food-related programs and events that are tied with community development and community capacity building efforts? Do these programs and events respond to the overall PFIVI scores?

I identified and selected 153 Philadelphia NPOs that offered food-related programs and events that were tied with their overall community development and community capacity building efforts. Generally, these programs were offered more vigorously in areas with higher PFIVI scores. A major portion of these programs were targeted toward vulnerable or disadvantaged populations and accepted government assistance cards. However, spatial mismatch issues were seen in a few areas, which have
been also reported in other studies (Meenar & Hoover, 2012). Some NPOs did not dedicate their time and outreach efforts to their own constituents or did not make economic contribution to their own service areas, but rather served the whole city.

Community involvement is one of the areas where many NPOs could have a better focus. Although most NPOs receive resident feedback, either through digital media or in-person communication, only a few NPOs are able to incorporate feedback into the decision-making process or planning process for any future events. Informational access remains a big challenge. In some places people have confusion about the availability of fresh and healthy food. For example, although participants of a household health survey in some neighborhoods mentioned that they did not have access to healthy and affordable food or they did not think the quality of produce, if available, was good, my findings gave an opposite impression. This may mean that many residents in those areas, or at least those who participated in the household health survey, were not well-informed about existing fresh food outlets. Moved by this issue, most NPOs are trying hard to increase such informational access, especially with the help of digital social media, which is used by 94% of the NPOs; but at the same time, those NPOs are being challenged by the issues around the digital divide.

*Question Set 5*

What is the nature of inter-organizational relationships and networks among NPOs that address community food insecurity and vulnerability? Is there any association between organizational network density and PFIVI scores? Is there any association between bridging/bonding networks and PFIVI scores?
A place-based organizational network analysis revealed many different types of partnerships that exist among Philadelphia NPOs, i.e., financial partnerships, resource exchange, volunteer exchange, grant writing, and joint-project management. In contrast, 25% of the NPOs did not report any “formal” partnerships with other NPOs. Although Philadelphia’s NPO organizational network connectivity map generally looked like a dense network, actual density values of the NPOs were very low, and in some cases spatially mismatched, and were not responsive to their area’s respective PFIVI scores. The Central district was an appropriate example, as the district had the highest network density but very low PFIVI score.

The NPOs generally had more bridging partners than bonding. Most NPOs travelled 2 to 5 miles to reach out to their partners, although distance was not considered as a condition for making partnerships for most NPOs. Generally, larger and more “visible” NPOs had partnerships with other larger NPOs, were regularly featured in the media, and were invited into the policy-making process, whereas many smaller NPOs did not get similar attention, regardless of their on-the-ground hard work and commitment. From this analysis, it can be interpreted that the more bridging networks an NPO has, the more central it is to the whole organizational network. The finding is consistent with Kropczynski and Nah (2010).
Contribution to Theory and Methods

The intellectual merit of this research is both theoretical and methodological. The study involved interdisciplinary theory and methods from the fields of geography, planning, and sociology. Here I discuss five specific contributions of this research.

Social ecology. This study argues that examining the role of NPOs in addressing an urban social issue can follow a social ecology framework. This idea was more applicable to this research because several components of this research are tied with ecological processes – urban farming, vegetation, vacant land remediation, stormwater management, and urban wildlife and bio-diversity, and several components are tied with human and social processes – community engagement, community capacity building, social capital, and neighborhood conditions including race, class, and gender. A social ecology approach re-harmonizes human processes with ecological processes and at the same time celebrates diversity, creativity, citizenship, and freedom.

Figure 27 displays how NPOs can be placed in an urban social ecology context, and compares the resemblance with an individual’s social ecology. An individual’s social ecology diagram, adapted from Dahlberg and Krug (2002), appears in the right side of the figure. According to this diagram, an individual’s social ecology incorporates four-tier stages: individual space; relationship with other individuals; community that includes schools, churches, and organizations such as NPOs; and societal or public policies/norms that include inequalities due to economic condition, race/ethnicity, or sexual orientation. The idea of including the physical environment that overlaps with these four-tier stages comes from McLeroy et al. (1988) and Sallis et al. (1998).
Figure 27. Understanding NPOs in urban social ecology context.
In the left diagram (in Fig. 27), I suggest that an NPO’s socio-ecological context may include similar four-tier steps: individual NPO; relationships with other similar types of NPOs serving in the same area; community that includes other types of NPOs and other organizations serving in the same or other areas; and public policy that includes economic, social, and land use policies. Based on this figure, it can be interpreted that community is the place that intersects the spaces of an individual and an NPO.

Food justice. The food justice theory set the premise for my analysis of the PFIVI index, as well as my examination of NPOs’ role in securing food justice in disadvantaged urban neighborhoods. This study primarily followed a viewpoint that “there seems to be a lack of alignment between the various aspects of the food movement narrative that drift into the food justice movement, and the conditions of racism and poverty that activists like Will Allen [of Growing Power, Milwaukee] seek to address” (Alkon & Agyaman, 2011, p. 344, parenthesis in the quote is my insertion). Such lack of alignment, as Guthman argues, is one of the primary reasons why food justice programs or initiatives often struggle to engage the communities they intend to serve (Guthman, 2011).

This study conforms with the argument that there are debates associated with race, class and the language used in the urban food movement – a process primarily led by White, middle-class activists (Alkon & Agyaman, 2011). This research did not accept the food movement at face value, but looked at the movement critically to see how in many ways it perpetuates the issues it claims to be fighting for/against. Following the food justice narrative, this study incorporated the issues of hunger and food hardship with different aspects of the food movement (i.e., local food production and distribution, food
consumption habit and health, and community engagement) in one single study, which has not been seen as a common research practice. Having such a broader perspective provided guidance to understanding the many different viewpoints associated with food insecurity and vulnerability.

**Social capital/social network.** This research agrees with the on-the-ground argument that community engagement is the heart and soul of most NPO programs and events, and their capacity building or community development efforts, and thus corresponds with existing social capital/social network literature. After presenting a statistical overview of several decades of decline in sociability and civic participation in Bowling Alone (Putnam, 2001), Putnam and his co-author Feldstein showed some evidence of new forms of social capital and innovative forms of social connectedness through various programs in different parts of the country, including arts programs, neighborhood civic organizations, virtual communities, or after-school programs (Putnam & Feldstein, 2003). This research confirms those findings by discussing the many creative ways NPOs engage young and older populations in neighborhood-based food production, distribution, and food-related programs and events. As we see in this research, today’s food-centric community-based or grassroots organizations in many disadvantaged neighborhoods are playing a crucial role in building community social capital, social networks, and community capacity.

**Mixed-methods and qualitative GIS.** This study argues that qualitative methods of data collection and verification and qualitative decision making can be incorporated in an established GIS methodology such as raster overlay analysis. Following this research
methodology, Figure 28 demonstrates a schematic diagram of this qualitative GIS approach in a typical raster overlay analysis. A mixed-methods approach allows a researcher to examine any social problem more comprehensively, especially if the research problem is as multi-dimensional as food insecurity and vulnerability. The results that I found in this study by using mixed methods, including qualitative GIS, would not be possible to find by taking only a quantitative or only a qualitative approach. Qualitative GIS as a method is still evolving, and this research contributes to the ongoing efforts of direct blending of these two approaches (see Jung & Elwood, 2010).

Figure 28. Raster overlay analysis using qualitative GIS.
Spatial social network analysis. This study explored how social network analysis could be simultaneously used with spatial analytic methods such as GIS – a combination field that has begun to be explored only recently. Recent research studies have discussed the ways “(1) spatial locations influence social networks, (2) social networks influence spatial location and environments, (3) social and spatial boundaries can be contextually defined, (4) integrated measures of networks and space can be constructed, and (5) combined network and spatial effects can produce social, behavioral or health outcomes and patterns” (Adams et al., 2012, p. 1). Through this research, I join with the argument that there is a lack of integration between the scientific community of inter-organizational network research, of SNA, and of spatial network analysis (SPNA). I have shown in this study that SPNA calculation is possible using a variety of tools available in Desktop GIS software, but the tools are disjointed. In addition, the calculations for network density and bridging or bonding network were done manually. It is important to merge the tools available in typical SNA software with desktop GIS, so that regular users, including NPOs, can utilize this tool and run their own organizational network analysis that is grounded in their own communities. GIS has been integrated to social media analysis (Facebook, Twitter feeds, Flickr, etc), but integration of SNA and GIS is still at the phase of infancy.
Contribution to Practice and Policy

Many aspects of this research were grounded in practice and policy. Here I discuss five specific ways this research could contribute to food-related practice and policy at the local level.

Alternative hunger relief. Hunger relief agencies traditionally have distributed mostly imperishable, canned food – a practice that has been criticized as unhealthy (Companion, 2010; Meenar, 2012). These agencies typically receive donations, either food or monetary, from processed and junk food chains without conflicting with their overall agenda, i.e., feeding the hungry. There are debates associated with giving “unhealthy” food to the needy while, at the same time, attracting recognition and promotion to unhealthy food businesses. This study reports that there is a new wave of hunger relief services that encourages relief agencies to focus more on healthy food distribution – a new food relief culture seen in Philadelphia and other cities in recent years.

Three distinct models have been applied in this practice: (i) Through formal and informal networks, community gardens donate fresh produce to food cupboards that are delivered to homes or picked up by people in need (e.g., PHS City Harvest program); (ii) food banks collect donated produce by city gardeners or collect vegetables from local and regional farms through gleaning and then distribute directly in disadvantaged neighborhoods (e.g., Philabundance Fresh for All program); and (iii) grocery store look-alike choice cupboards with refrigerators store produce for distribution (e.g., Green Light Pantry). Such programs and partnerships need to be encouraged and formalized even
further, possibly by increasing the capacity of food cupboards (storing perishable food in refrigerators) and by making a connection to government assistance programs.

In addition to encouraging these models, nutritional education should be tied more heavily with hunger relief services. Hunger relief NPOs that are focused on SNAP benefit enrollments need to provide more nutritional education to the target population. A major portion of SNAP benefits are spent on products developed by the junk food industry, which produces cheap, high calorie food with low or no nutritional benefit. Since many families do not have the time or knowledge to cook different types of fresh produce, nutritional education paired with cooking lessons and cooking plans would be useful. Example of such a practice is the Green Light Pantry, which not only distributes fresh food, but also offers free health screenings, nutrition classes, and other services (Greater Philadelphia Coalition Against Hunger, 2013).

Questions may arise concerning whether NPOs can influence people’s choice of food. A number of empirical studies have recorded such influence. The *Eat Well, Eat Local, Eat Together* nutrition education campaign influenced 10,000 individuals from 20 counties of upstate NY who self-reported that their behaviors on campaign themes shifted significantly (P < .0001) in a positive direction. Influenced by these campaigns, more people started to consume 5 or more servings of fruits and vegetables each day, more people purchased local foods at a higher frequency, and more people started to have family meals at least 4-5 evenings per week (Olson & Graham, 2013). A USDA pilot project has shown similar results. Initial findings found that people on food stamps who
received a small monetary incentive for buying more fruits and vegetables consumed 25 percent more produce than those who did not (Heavey, 2013).

Closing the spatial gap. The issue of spatial mismatch between service providers and service recipients appeared a number of times in this dissertation (see Chapters 5, 6, and 7). Food insecurity and vulnerability are heavily or partially concentrated in a number of planning districts in Philadelphia and also disproportionately affect minority and vulnerable population living in distressed neighborhoods. While the city has an active civic infrastructure of NPOs that try to build community capacity and act as potential agents of change in these neighborhoods, we must consider one key factor: spatial mismatch between the locations of these NPOs and the services they provide. This finding from my research confirms the findings from another study by Twombly et al. (2000) published more than a decade earlier.

Geographic clustering of NPOs (particularly professional or membership organizations) may seem important for providing synergy and facilitating collaboration; however, it is crucial for at least those NPOs that provide direct or on-the-ground services to be located in neighborhoods where most people live and need their services. The absence of this pattern will prolong spatial mismatch issues. Although NPOs need to consider a number of factors, including availability of office space, public safety, transportation routes, zoning restrictions, or community support, it is important that NPOs engaging community residents in their capacity building efforts are literally grounded in those neighborhoods and earn community trust.
Active support from government agencies can play a crucial role to minimize the service gaps or spatial mismatch issues. Examples of such support may come in the form of active collaboration between government agencies and NPOs to administer projects targeted in lower-income neighborhoods and assess the outcomes of such project through research and publications. The City of Philadelphia’s health department has such partnerships with The Food Trust – an important collaboration behind projects such as farmers markets and healthy corner stores in lower-income neighborhoods.

*Increased collaborations among NPOs.* This study of organizational networks included all the food-related NPOs in Philadelphia. If the study was designed around only the larger NPOs, the results of network density tests would turn out much higher, because larger NPOs, such as PHS, have denser and broader networks throughout the city. Partnerships between NPOs, for most of the time, are dependent on successful past experiences and the trust generated among them (Brown et al., 2006; Gazley & Brudney, 2007). Bess et al. (2012) found that organizations that became participants in [a new] coalition had a history of past collaboration with each other at a significantly higher rate than those organizations that did not participate. That is why NPOs can benefit from “more systematic empirical investigation of the factors that influence partnership performance of lead-organization networks” (Chen & Graddy, 2010, p. 418).

Smaller NPOs, in most cases, cannot increase their connectivity with other NPOs by making collaboration or partnership, as they do not have staff support to reach out to potential partners or do not have enough capacity to maintain an informal relationship. However, this does not mean that the network itself is flawed. Maybe community-based
smaller NPOs don’t need to be inter-connected in that way, as long as their projects (such as community gardens) are grounded in the neighborhoods and well-connected to local residents. But advocacy, outreach, and membership-based NPOs that have city-wide or even regional service areas need to be closely connected to smaller community-based NPOs that oversee actual on-the-ground projects.

The question that most NPOs in a network, either smaller or larger, always ask is: What happens when a hole appears in the safety net? What if a key player or a continuous major funding stream disappears from the scene? Philadelphia has witnessed a sharp decline of community gardens since the 1970s after the discontinuation of critical resources, including major funding streams. It took almost two decades to explore new networks and find new funding sources. Since NPOs are often considered as the anchors and great resources to a community life, many public and grant-providing agencies are interested in building their organizational capacities. Problems arise when programs start becoming successful and then get discontinued because of an obsolete funding stream.

Although NPOs always compete with one another to catch a funder’s attention, there is no alternative to strengthening coordination and partnerships not only among NPOs, but also with other organizations such as governments and institutions. Coordination efforts among NPOs and smaller agencies (such as food cupboards or grassroots community gardens) can be made stronger at both the local and state levels. Pennsylvania’s Inter-Agency Council on Food and Nutrition proposed a blueprint for a hunger-free Pennsylvania by recognizing the fact that state government alone cannot
address hunger or eliminate chronic food insecurity by 2020 – one of the stated goals announced in 2007 (Pennsylvania Department of Agriculture, 2007).

*Increased informational access.* Since the lack of informational access affect both customers and NPOs, as reported in this study, NPOs need to increase informational access, either in-person or digital. Although NPOs rely heavily on digital platforms for their promotional or informational purposes, there is no single platform for sharing various types of information, making people or NPO representatives misguided. In order to ensure consistency and reliability of information, NPOs may rely on a theme-based or comprehensive knowledge base. An example of a thematic database would be New York City’s 596 Acres web site where people can have access to interactive maps of vacant lots and location of potential community projects (see https://596acres.org).

Philadelphia’s PUFN listserv is an example of a digital community for sharing knowledge and resources and building new networks. For hunger relief agencies, a shared online tracking system might be an efficient way to manage client records available to only agency representatives. Examples may include the total amount of food distributed through cupboards or the total number of people received any assistance in a given year. Such a system should enlist all the city-wide agency locations and their operating hours, so that they can address the spatial mismatch issues and be creative while scheduling operating hours.

Once the Internet was blamed for being one particular source of citizen isolation (Putnam, 2001), but new research studies have linked social media use to more engaged citizenship and higher levels of social capital (Valenzuela et al., 2009; Zhang et al., 2010;
Gil de Zuniga & Valenzuela, 2011). Many NPOs use Internet and digital technologies in their information sharing and community capacity building efforts. As one of the first reviewers of the societal dimensions of the Internet, DiMaggio et al. (2001) explained how the Internet creates an informed and engaged public and how it sustains the bonds of community by complementing other channels of interaction. Digital social capital is a new form of community engagement that might be associated with some risks (Mandarano et al., 2011). The advent of Web 2.0 has significantly changed the nature of information sharing and collaboration on the Web (Christopher, 2007). Using advanced interactive tools such as distribution lists and photo directories, Web 2.0 has built new forms of social capital and reshaped peoples’ sense of community (Resnick, 2001). Technological advancement of interactive online GIS mapping has played a significant role in Community GIS (CGIS) projects (Craig et al., 2002). New CGIS projects offer collaborative, interactive and easy-to-use environments that can reach a broad community of users (Dennis, 2006; Rouse et al., 2007).

Research on social networking sites indicates that digital communication has a strong influence in creating social capital (Boyd & Ellison, 2007). However, digital divide literature has explained how behavioral, social, and institutional contexts have become interconnected facets of digital inequality (Gilbert & Masucci, 2005). According to this literature, social and digital inequalities are intertwined (Hargattai, 2003) and there is an influence of social and income inequality on the use of digital technology (Fuchs, 2009). The issue of the digital divide can be addressed with on-the-ground innovative ideas, as seen in many cities such as Philadelphia (availability of free WI-FI access in
many local businesses or institutions) or Baltimore (use of Internet-based hunger relief assistance in free libraries).

*Effective land use and zoning policies.* This study discussed some common issues faced by post-industrial landscapes, including vacant land and absentee landlords, low-density residential areas, and elimination of community food resources, such as the closure of grocery stores. In looking at recent efforts to incorporate urban agriculture (UA) into land use planning, it is critical to recognize that UA has been predominately a distinctly nongovernmental, community-based, grassroots strategy. UA emerged, in part, as a response to urban disinvestment and unsuccessful governmental interventions. UA projects such as community gardens and market farms usually exist on land that was abandoned and blighted for many years, because the owners are dead or long gone and there are no known family members. Most of these projects were created when the choice is not between a farm and a condo development, but between a garden and blight on such a property. Municipalities are beginning to see UA as integral to planning and zoning practices, as well as to policies allowing gardeners permission to use public lands or purchase surplus or vacant lands (Hodgson, 2011). Under Philadelphia’s newly adopted comprehensive zoning code, community gardening is allowed in almost every residential and commercial areas and market farming is only slightly more restricted.

A recent example in Philadelphia showcased the informal partnership between the city and UA activists. The decades-old Saint Bernard community garden property was subjected to a sheriff’s sale. Due to a high level of community engagement, the Councilwoman’s office became supportive. As result, the city representatives bid on the
property and won. The next steps for the garden would be to work with the city to ensure that the property becomes a land trust and remains a garden. City planners are coming up with innovative pro-urban agriculture ideas. Districts such as the Lower North have so few people living in them that it may make more sense for the city to buy out the few remaining residents and use the land for something else, such as farming, said the district plan manager (PlanPhilly, 2013). The relationship between the city and UA activists are not without conflicts. Recently, a Philadelphia city councilman had to withdraw an amendment plan to the recently adopted zoning ordinance after getting “an earful” from UA advocates and organizers (Dunn, 2013).

Although UA activists see such occasional collaborations with the city, they expressed their frustrations in this research, because there is a lack of a coordinated dialogue between UA stakeholders and city officials. After a two-decade setback, UA is flourishing again in Philadelphia due to the efforts of gardeners and farmers on-the-ground. The new zoning code has undoubtedly provided a structure to encourage new projects to emerge, but additional and coordinated support and leadership are needed from policymakers and the Food Policy Advisory Council to ensure that polices are effective and responsive to community needs. Prioritizing resources or developing pro-UA polices are not enough; planners and policymakers must engage UA practitioners in planning and creating policies, otherwise the results will not be responsive to community and stakeholder needs (Meenar et al., 2012).
Study Limitations and Future Research Agenda

I have discussed specific limitations of this research in a number of places throughout this dissertation (see chapters 4 through 7). But the study context itself might be seen as a limitation to many. The food justice movement has exclusively focused on urban areas with limited food access, and on lower-income people and people of color as small producers, consumers, or those without access to local and organic food (Alkon & Agyaman, 2011, p. 338-39). A future study may incorporate a similar methodology in a rural context. Reaching out to rural areas and food sector workers and their economic exploitation will expand the canvas.

Future research on the role of food-focused NPOs should address more than the limitations mentioned in this research. For example, the proposed PFIVI model, if applied in other communities, can include a few additional variables, such as the number of fast food restaurants per census tract, especially if the study is based on an area known as a food swamp. Although relevant to limited demographics, school-based food programs should be an important addition to the model. In the case of a multi-city study, variables related to local food policy and the environmental impact of urban food production and distribution should be considered. Finally, the PFIVI model can be further developed in a way that it includes the dynamic nature of neighborhood food insecurity conditions over time.

Since people and organizations are spatially embedded, research on social networks may require an understanding, visualization, and analysis of the spatial dimensions of social networks. GIS-based tools are not yet easily available for
conducting “spatial” organizational network analysis, but I have tried to experiment with the theme with available resources. This is a topic that needs to be further explored. Recent research studies have started exploring the connections between SNA and geographic locations, but most of those are done at the individual actor level, not at the organizational level (see Ghosh & Altice, 2013). Another recent study has analyzed how the intersection of place-based NPOs, their weak relations, and their overlapping or exclusive territories played a role in choosing sites for housing development (Watkin, 2013).

Future studies may address the following questions: How are the actors in a network situated in space and place? Is there any correlation between social and spatial clusters? How do place-based considerations help understand a network structure? For more question ideas, see a NCGIA workshop report (http://www.ncgia.ucsb.edu/projects/spatio-temporal/docs/workshop_report_final.pdf). A future study may conduct a relational organizational network analysis and then compare it with the results from spatial organizational network analysis. For both types of analysis, a study can consider classified or categorized organizational relationships based on funding, resource-sharing, advocacy, and project-management. Connection to other types of organizations, such as religious institutions, academic institutions (including schools and university research centers, university extension units), foundations, and even government agencies at the local, state, or federal levels, should be included in an organizational network analysis.
What does network centrality look like in a geographic space? Network centrality is “a measure of how concentrated all the ties are within a particular network” (Lewis, 2005, p. 6). It can be assumed from this study that Philadelphia-based NPOs have a lower percentage of network centrality, which indicates that ties are dispersed between NPOs in most areas. There are a few NPOs in Philadelphia that are perceived to be more valuable as relationship partners, influential, and prestigious, and to a certain extent they control access to information and other resources. There are many forms of network centrality (see Freeman, 1979); one of them is Degree Centrality that measures the number of relationships an actor holds in a network, the actor’s importance, influence, or prestige in a network (Wasserman & Faust, 1994; Flanagin, Monge, & Fulk, 2001; Doerfel & Taylor, 2004). An analysis of network centrality would explore the inter-organizational relationships even further.

As seen in Chapter 7, some of Philadelphia’s planning districts that faced a high level of food insecurity and vulnerability had strong, medium, or even weak organizational network with other food-focused NPOs. Since density calculation, especially aggregated at a geographic unit, did not offer the complete nature of the organizational network, future studies may experiment with other geographic units or even consider the whole city as a single geographic unit. Or, organizational density can be calculated for different types of organizational relationships. More ideas for future research related to organizational network analysis can be drawn from recent conferences, such as the Sunbelt Conference, 2013. Inter-organizational networks grow and decline over time, but only the growth process usually attracts researcher’s attention.
Future studies should examine why and how networks may decline (see Gilding et al., 2013).

Future studies related to policy analysis may discuss the intersection of hunger relief services and urban agriculture, which has been reported as an alternative way to include nutrition in poor peoples’ diets. Policy guidelines should be generated on the ways to make fresh and healthy food more accessible and affordable in disadvantaged neighborhoods. In addition, the economic development aspect of urban-food-production related research will be one of the key research agendas in the near future. Not much data on this topic were available in my study, and the response rate for this question in my survey was also among the lowest. But future research should focus on the “direct” economic contribution of food-related programs in an urban context.

Final Remarks: NPOs Addressing Food Justice?

By taking the City of Philadelphia as a case example, this research has documented how NPOs address food justice issues in inner-city neighborhoods by providing hunger relief, offering healthy, affordable, and culturally appropriate food through the alternative food movement, and building community capacity through a variety of food-related projects, programs, and events. Of course, there are important issues and debates associated with NPO activities, such as the spatial mismatch of service providers and recipients, social and racial exclusion, inadequate organizational coordination and organizational networks, and the lack of informational access. The bigger question is: Even if NPOs address these issues and revamp their strategies and
projects wherever needed, will that bring food justice in a post-industrial city like Philadelphia? I ask this question knowing the fact that food justice cannot be achieved with the work of only NPOs; other organizations, funding sources, and government agencies need to work together with the same focus. Since I have studied NPOs in this research, my concluding remarks will be related to NPO activities only.

Before attempting to answer this question, I need to revisit my basic understanding of food justice, as informed by Alkon and Agyeman (2011). These authors presented the food movement and food justice as two separate movements. The food movement ignores the justice issue, both racial and economic justice, as it is primarily about sustainable food production, organic food, and healthy eating habit. It ignores the institutional racism issue that might be a cause or factor in food insecurity and hunger. The authors documented a parallel scenario by presenting the tension that existed in the last century between environmentalists and environmental justice advocates. The mid-20th century environmentalists mostly cared about rural and wilderness preservation and ignored urban environmental issues as seen in lower-income minority communities. Later, the arguments of environmental justice advocates were included in the broader environmentalism narrative. Similarly, most of the food movement narrative, written by White and middle-class individuals, advocate for environmental sustainability, strong local communities, and personal health.

In contrast, food justice sees “food not only as a way to build community, but as a tool toward racial and economic liberation” (Alkon & Agyaman, 2011, p. 335). Food justice and the prioritization of local food systems are not inherently compatible;
programs targeted toward making a connection between local food production and consumption with the needs of lower-income communities are not comprehensive or free from market forces and fluctuations from grant funding (Allen, 1999). It is, however, suggested that the food movement might increase its potential to work with lower-income and minority people “who are already interested in the production and consumption of local food” (Alkon & Agyaman, 2011, p.335).

So, if I go back to my question, I can say that no, addressing the key issues related to NPO programs discussed in this study will not automatically bring food justice to lower-income and minority neighborhoods. Broader schemes and actions need to be taken by NPOs, many times with the help of communities, funders, and government entities. Here I discuss a few basic steps as action plans or policy recommendations.

_Strengthening organizational networks._ Community-based NPOs require “greater decision-making power in the policy-making process and resource autonomy for policy implementation” (Silverman, 2004, p. 2). This is more important for smaller NPOs and grassroots initiatives in lower-income and minority neighborhoods. Better network connections need to be made with these NPOs in order to hear their voices, increase their visibility in the larger policy discussions (i.e., zoning ordinances, city-wide dialogue on food justice, etc), and ensure their participation in the local food movement, which is primarily led by young, White, and middle-class activists. Other research suggests that African-Americans participate less in the alternative food movement, because recent trends have become “unbearably white” (Guthman, 2011) in many places. Engaging diverse populations in the food movement and policy discussions will provide different
viewpoints and address questions such as the followings: “[How] does a neighborhood predominately occupied by African Americans see themselves participating in this movement? What sort of food would this neighborhood be more inclined to purchase, or, better yet, grow? What does a local Latino community believe should be included in city zoning codes? … [Who] is gaining access to city land, and how they are doing it?” (Hoover, 2013, p. 5). Couple of examples of grassroots and community-based NPO coalitions in Philadelphia includes the Campaign to Take Back Vacant Land and its recent food/garden-based offshoot, Healthy Foods Green Spaces. In order to achieve food justice, it is important to have representation of NPOs from disadvantaged neighborhoods in the city-wide policy discussions and plan implementation processes.

*Strengthening social network with community residents.* Most examples of NPOs that I found demonstrated that community-based NPOs closely work with neighborhood residents, regardless of their age, income, and race. Geographically, the majority of those residents who are active participants of community-based programs live within walking distance (1/4 mile) of a project site such as a community garden (Meenar & Hoover, 2012). However, White, middle class, young people are more actively involved in such programs and activities, even if those are located in a predominantly Black or Latino/a spaces (Meenar & Hoover, 2012). In order to have a successful impact over a long period of time, NPOs need to overcome social exclusion issue that may exist in many neighborhoods (see discussions in Chapter 6). NPOs need to explore new avenues to better connect with minority populations and engage them in their activities, as well as in decision making or the planning development process. It is not about “educating” or
“enlightening” them, but to involve those individuals who are interested in such activities but may feel estranged. If it is a grassroots initiative in a neighborhood or it is initiated by an NPO that has worked in the said neighborhood for a long period of time and earned the trust of neighborhood residents, then the success rate will be usually higher. Research suggests that “trust is a stronger prerequisite for, than an outcome of, civic engagement” (Jennings & Stoker, 2004, p. 370). Problems arise when an NPO with a city-wide network decides to start a project in a specific neighborhood without any prior discussion and partnership with local residents. Many times those are the projects that become prone to vandalism.

Offering healthy but affordable food. Dietary decision making is highly constrained by both household circumstances and neighborhood food environment (Larson et al., 2009). Since the alternative food movement has opened up the options for alternative food lovers, higher- and middle-income people now have plenty of choices – sustainably-grown or organic food, artisanal vegetables, culturally appropriate food, nutritionally adequate food, and delicacies. But in terms of a specific clientele (i.e., lower-income and minority population groups), providing true access to healthy food must include the affordability factor. Philadelphia examples have shown us that many NPOs, with partnerships with funding agencies, local government agencies, small businesses, and institutions such as hospitals and universities, try to focus on this matter, but more needs to be done in terms of offering similar arrangements to all lower-income neighborhoods and through all types of projects, including farmers markets, CSA programs, and healthy corner stores. We need to remember that these healthy foods –
either produce, fruit, or dairy – compete with cheap junk food, either available in corner stores in the form of chips or sugary drinks, or in fast food stores in the form of dollar-menu cheeseburgers, fries, or sodas. Many people complain about not having time to cook meals from scratch with raw ingredients, or to travel to a grocery store by a long walk or even lengthier bus ride to buy healthy food. Density of fast-food restaurants is negatively associated with fruit and vegetable consumption (Larson et al., 2009). So, unless varieties of healthy, fresh foods become affordable and conveniently available in the neighborhood in good quality and in a consistent manner, people will continue eating those junk foods. An increased economic access to healthy food will also address the social exclusion debate.

**Conclusion**

This study had two interconnected components. The first component involved the development of *Place-based Food Insecurity and Vulnerability Index* that helped us locate inner city neighborhoods that are food insecure and people who are vulnerable to food hardship. The second component was developed around NPO-driven programs and events that address food insecurity issues through hunger relief, the alternative food movement, and community capacity building efforts. Statistical relationships between these two components showed some spatial mismatch issues between NPO-driven programs and community needs in specific neighborhoods. This research also highlighted other limitations of these programs and the challenges that they face both on- and above-the-ground. The methodology used in this study, with some modifications, should be
applicable in other urban or even rural communities, but successful application of the models will be dependent on the availability or affordability of creating highly detailed datasets. The study findings have shown possible contributions to theory, methods, practice, and policy.

This research used the City of Philadelphia as the study area. Based on the findings and discussions, Philadelphia can be seen as a better example for the NPO-driven food activism that applies innovative methods to handle food insecurity and vulnerability issues. This understanding or narrative is consistent with the image of the city as portrayed in national and local media such as the New York Times and Philadelphia Inquirer, which commented – “In recent years Philadelphia has earned a national reputation as a hub for community gardening and farming” (Philadelphia Inquirer, 2013). The city has not only become a role model for urban food production, but also for its various other innovative programs, including the Fresh Food Financing Initiative, the Healthy Corner Store initiative, and City Harvest – programs that have been already applied in other cities. But do Philadelphia NPOs promote or secure food justice? I addressed this question with a mixed reaction. While the NPOs are trying hard to promote food justice through their mission statements, advocacy, outreach, and on-the-ground programs, the city may have only partially achieved this goal. A lot more needs to be done by strengthening organizational networks, strengthening social networks with community residents, and offering healthy but affordable food in disadvantaged neighborhoods. And, quite reasonably, NPOs cannot do that alone.


271


283


Kretzmann, J., & McKnight, J. (1993). Building communities from the inside out: A path toward finding and mobilizing a community’s assets. Chicago, IL: ACTA Publications.

286


291


Walter, N. A. (2004). The American space of hunger: Geographic, political, and economic change and the ability to eat in the United States in the late 1990s.


This is a survey of organizations (non-profits, grassroots, mission-driven for-profit organizations or small businesses) that have any “food” related policies, programs, projects, or initiatives in the City of Philadelphia. As a representative of such organization, you are invited to participate in this online survey. The aim of this study is to evaluate how these organizations provide healthy food access, support local food systems, promote food justice, develop social networks, offer education, training, and job, and build community capacity in the city. The survey results are expected to provide valuable information to planners, public health professionals, policy makers, and community activists. Temple University's Mahbubur Meenar, a doctoral candidate and an assistant director of the Center for Sustainable Communities and Dr. Michele Masucci, chair of the Department of Geography and Urban Studies, are leading this study.

This survey will take about 15-20 minutes to complete. Your participation in this survey is voluntary and you do not need to provide any personal information. At the end of the survey you will be prompted to provide your name if you elect to participate in a follow-up interview. This research has been reviewed and approved by the Institutional Review Board at Temple University. If you have any questions, concerns, or complaints about the survey, please do not hesitate to contact Mahbubur Meenar (267-468-8314 or meenar@temple.edu). Please participate by October 31, 2012.
Does your organization have any “food” related policies, programs, projects, or initiatives?
   Yes    No

If you answered “Yes”, please proceed with the following survey.

**Basic Information**

1. Please tell us about your organization.
   Name of the organization: ____________________________________
   Official 501(c) status (Yes/ No): ______
   Street number, street name, zip code: ______
   Year established: ______
   No of full-time staff: ______
   No of part-time staff: ______
   Annual operating budget: _______

2. What is your role in this organization?
   - Board Member
   - Management
   - Staff
   - Other (please specify)

3. Geographically define the service area of your organization.  
   *Examples – Fishtown neighborhood, Zip code 19125, Census Tract 113, or street names as boundary markers*

4. What words or phrases best characterize your organization’s mission? (May choose more than one)
   - Community Capacity Building
   - Community Economic Development
   - Food Advocacy
   - Food Distribution
   - Food Education & Training
   - Food Justice
   - Food Policy
   - Food Production
   - Food Security
   - Other: _____________________
**Programs and Events**  
In this section, we are asking questions about projects, programs, events, and initiatives of your organization that are related to food systems.

5. Does your organization have any of the following programs or initiatives in Philadelphia? If yes, please provide their location information (address). 
(May choose more than one program and may specify more than one address)  
   a. Community gardens  
   b. Community supported agriculture (CSA)  
   c. Farmers’ markets  
   d. Food co-operatives  
   e. Market farms  
   f. Orchards  
   g. Other  
   h. Comment: _________________________________________

6. Do your programs accept government assistance cards (i.e., EBT, WIC)?
   Yes  No  Not Applicable  Some of the programs, not all

7. These questions are about urban agriculture program. If your organization does not have any urban agriculture program, please move on to question 10.

7a. If your organization runs community gardens, please provide the approximate percentage of participants (gardeners) who live inside your service area.  
   Check one  
   a. 0%  
   b. 25%  
   c. 50%  
   d. 75%  
   e. 100%  
   f. Don’t know

7b. If your organization has an urban agriculture program, please check one of the following situations related to land tenure.  
   g. Own land  
   h. Leased from the city  
   i. Applied for lease with the city  
   j. Have an agreement with private property owner  
   k. Do not know the property owner  
   l. Have experienced land tenure problems (please provide a brief description)  
   m. Other (please specify):  
   __________________________________________________________
7c. Has your organization revamped any vacant land for food production in your service area?
   Yes  No

7d. If your answer is yes to previous question, please share any relevant information.
   No of vacant land revamped _______
   Total area revamped (approximate) _______

8. If your organization is affiliated with any food cupboard, please mention the approximate amount of food (in pounds) donated over the last 12 months.
   ________________________________________________

9. How many times the following “food” focused programs your organization may have offered over the last 12 months.
   Educational and training programs
   Internships and voluntary work programs
   Programs that are culturally relevant to minority population, ethnic groups, and minority religious groups

10. Approximately how many people attended or participated in your “food” focused programs over the last 12 months? (Answer, if applicable)
    Educational and training programs ______________
    Internships and voluntary work programs ______________
    Programs that are culturally relevant to minority population, ethnic groups, and minority religious groups ______________

11. How many events did your organization arrange or host in the last 12 months? (Events that are related to your organization’s food programs)
    a. Fundraising events
    b. Cooking demonstrations
    c. Potluck, work party, or block party
    d. Lecture or discussions
    e. Movie and music events
    f. Workshops and tours
    g. Other (please specify) _______
    h. None

12. What is the percentage of your programs targeted toward vulnerable/disadvantaged populations (older adults, lower-income, minority, refugees, ethnic groups, and minority religious groups)?
    0  1 - 25%  26%-50%  51%-75%  76-100%  Not applicable
    Our programs are open for all
13. If people have to pay to participate in your events, what is the average fee for an event?
   Below $10  $10-25  $25-40  $40+
   Our events are free
   Our events are donation based

14. What is the approximate ratio of people attending your events coming from your service area?
   Check one
   a. 0%
   b. 25%
   c. 50%
   d. 75%
   e. 100%
   f. Don’t have such data

15. How often does your organization host meetings with community members to plan activities and events?
   Frequency  average # of participants
   a. Never
   b. At least once a month
   c. At least once in six months
   d. At least once a year
   e. Other (please specify)

16. What is the average number of participants in a typical community meeting?

Organizational Relationships
Please answer these question with a focus on “food systems” related programs, projects, and partnerships.

17. Which organizations do you consider your best partners? Please list three.

18. What type of relationships did your organization have with other local and regional organizations over the last three years?
   Check all that apply
   Received funding (grants, donations, sponsorships, etc)
   Provided funding
   Wrote grant proposals
   Executed a program or policy
   Other (please specify)
19. If your organization has received funding over the last three years, please provide some details:

No of funding received: _______
Names of the most important sponsoring organizations (up to five):

20. If your organization has partnered with other organizations in writing grant proposals over the last three years, list the name of the organizations (up to five most important ones):

21. If your organization has partnered with other organizations in executing a program or policy over the last three years, list the name of the organizations (up to five most important ones):

22. What organizations do you reach out to when seeking information related to food systems/food justice/food security issues? (list up to five most important ones)

Local Economy

23. Please provide the following information about your organization with respect to food related programs.

<table>
<thead>
<tr>
<th>Number of jobs created during last 12 months</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of jobs retained during last 12 months</td>
<td></td>
</tr>
<tr>
<td>Approximate total funding received over the last three years (from federal, state, local, foundation, and other sources)</td>
<td></td>
</tr>
<tr>
<td>Amount of revenue earned during last 12 months</td>
<td></td>
</tr>
</tbody>
</table>

24. Did your organization assist other organizations or local businesses (monetary, labor, or other forms) over the last three years?
Yes  No

25. If you answered yes to the previous question, please mention the number of businesses assisted in your service area and the type of support provided.
26. What is your preferred way to communicate with partners, members, and community stakeholders?

*Answer using the following scale: most preferred (5) to least preferred (1)*

<table>
<thead>
<tr>
<th>Communication Method</th>
<th>Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Media (Email, social media announcement or message, text message, web site announcement, etc)</td>
<td></td>
</tr>
<tr>
<td>Print Media (Letter, leaflet, newsletter, brochure, poster, etc)</td>
<td></td>
</tr>
<tr>
<td>In-Person Communication (Door-to-door outreach, social gathering, phone call, etc)</td>
<td></td>
</tr>
<tr>
<td>Through newspapers</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
</tbody>
</table>

If your organization does not use digital communication, please go to question 27.

26a. Please provide some details on your organization’s use of Internet and digital communication.

*Check all that apply*

a. E-mail Listserv (provide approx. number of email recipients ____________)

b. Organization Website (provide web address ________________)

c. Social Media
   i. Facebook (provide screen name ________________)
   ii. Twitter (provide screen name ________________)
   iii. YouTube (provide screen name ________________)
   iv. Other (provide screen name ________________)

d. Blog (provide web address ________________)

e. Other (please specify) ________________

26b. What type of content does your organization share through social media (Facebook, Twitter, Google Plus, etc)?

*Check all that apply*

- Event and program announcement
- Post-event story
- Commentary
- Educational posts
- Politically motivated messages
- Local and national policy tidbits
- Information sharing
- Other (please specify): ________________________________
26c. What type of content do people share in your organizations’ social media platforms? 

*Check all that apply*

- Program feedback
- Post-event feedback
- Commentary
- Educational posts
- Politically motivated messages
- Local and national policy tidbits
- Information sharing
- Other (please specify): ________________________

26d. Do users’ comments posted on your website, blog, or social network sites influence the organization’s activities?

Yes  No

26e. If you answered “yes”, please provide an example.

__________________________________________________________

27. What major challenges (economic, social, or other) does your organization face?

__________________________________________________________

28. May I contact you for a short follow-up interview regarding this study? If yes, please provide your name, phone number and e-mail address.

__________________________________________________________