

Food Systems Assessment Report




CONNECT
Our Future

Vibrant Communities - Robust Region



The 14-county bi-state region includes: Anson, Cabarrus, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly and Union Counties in North Carolina, and Chester, Lancaster, Union and York Counties in South Carolina.

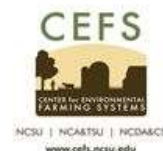
Food Systems Assessment Report

The food systems component of the CONNECT Our Future project focuses on supporting rural communities and areas that depend on an agricultural economy, while improving the quality of life for all residents. In the long term, the food systems work seeks to develop a regional food system that supports locally-produced foods and enhanced food access as a vital, growing, and sustainable component of the regional economy, and to ensure sufficient rural and agricultural lands to support the local food production economy.

“CONNECT Our Future” is a process in which communities, counties, businesses, educators, non-profits and other organizations work together to grow jobs and the economy, improve quality of life and control the cost of government. This project will create a regional growth framework developed through extensive community engagement and built on what communities identify as existing conditions, future plans and needs, and potential strategies.

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This document was prepared by Centralina Council of Governments and Catawba Regional Council of Governments in partnership with ASAP (Appalachian Sustainable Agriculture Project), CEFS (Center for Environmental Farming Systems), and CFSA (Carolina Farm Stewardship Association)



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Executive Summary

Introduction

This report was produced by ASAP (Appalachian Sustainable Agriculture Project) with CEFS (Center for Environmental Farming Systems) and CFSA (Carolina Farm Stewardship Association) to inform the food systems development work of the CONNECT Our Future project in Charlotte, North Carolina, and 14 surrounding counties: Anson, Cabarrus, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly, and Union counties in North Carolina, and Chester, Lancaster, Union, and York counties in South Carolina. (These counties will be referred to throughout this report as the “CONNECT Our Future project region” or “project region.”) This report documents current food and farm conditions, raises awareness of local food system opportunities emerging in the project region, and contributes to the CONNECT Our Future goal to develop a blueprint for regionally directed economic growth.

The Food Systems Assessment Report summarizes major findings from the assessment research and discusses key opportunities and actions for the region based on these findings. The research conducted for this report included a thorough inventory of existing food production and consumption data by county, as well as investigations into regional food system assets including infrastructure, markets, accessibility, and the food waste stream. The Food Systems Assessment Report also identifies the significant data indicators for local food systems throughout the CONNECT Our Future project region and can be used as a resource for the region's communities to conduct their own assessments based on community-specific needs.

The first three sections of this report focus on

statistical data and analysis regarding food and farm conditions, food production trends, and consumption patterns for the CONNECT Our Future project region. The last section of the report provides recommendations for strategic action and next steps for developing the local food and farm system of the region. Finally, there is a section containing each of the tables and figures referenced within the report.

CONNECT Our Future Project

CONNECT Our Future is a three-year process in which communities, counties, businesses, educators, non-profits, and other organizations in the Charlotte region are working together to grow jobs and the economy, improve quality of life, and control the cost of government. The food systems component of the CONNECT Our Future project focuses on supporting rural communities and areas that depend on an agricultural economy, while improving the quality of life for all residents. In the long term, the CONNECT Our Future Food Systems Project seeks to develop a regional food system that supports locally-produced foods and enhanced food access as a vital, growing, and sustainable component of the regional economy, and to ensure sufficient rural and agricultural lands to support the local food production economy.

In June 2013, ASAP was awarded the contract to develop a regional food systems strategy for the CONNECT project region. ASAP, in conjunction with CEFS and CFSA, designed a scope of work for three key components: a regional food systems assessment, a regional food systems action plan, and regional and sub-regional food policy council development. ASAP, CEFS, and CFSA participated in CONNECT Our Future Food Systems Work Group and Consortium meetings and engaged the CONNECT Food Systems Work Group to participate in key decisions throughout the process.

Key Findings

The 14-county CONNECT Our Future project region includes a mix of rural and urban communities with a diversity of economic opportunities for the region's 2.5 million residents; though nearly 40 percent of the region's residents live in urban Mecklenburg county, almost a third of the project region's nearly 7,000 square miles is devoted to agricultural production.

According to the most recent U.S. Department of Agriculture (USDA) Census of Agriculture conducted in 2012, the project region is home to 9,721 farms that reported agricultural receipts totaling over \$1.5 billion dollars. However, according to the census data, only 4.8 percent of farms in the region grow fresh fruits and vegetables. The majority of the region's farms produce crops like hay, grain, or animals like cattle that are born in the area but are exported out of state to be matured, slaughtered, and transformed into marketable goods.

When it comes to food production and the food system, the CONNECT Our Future project region's farm economy is in a period of transition. To some extent, change is being driven by a global trend toward continued consolidation of the food system resulting in loss of farms and farmland. At the same time there has been growth in demand for foods grown locally. Direct Sales – the USDA category used to describe transactions directly between farmers and consumers – increased by 30 percent from nearly \$3.7 million in 2007 to over \$4.7 million in 2012. The largest increases occurred in Chester, Lancaster, and Union counties in South Carolina. For the project region, this research finds a \$560 million gap between the amount residents spend just on fresh fruits and vegetables and the retail equivalent sales of these same fresh fruits and vegetables produced by local farms. In this context of transition, the potential for expanding local markets for local farm products is significant.

Within the CONNECT project region, there are at least 67 farmers markets (the equivalent of one farmers market for every 38,000 residents) providing locally grown food to community members. Several regional branding programs exist in the area to add value to local farm products, such as the North Carolina Department of Agriculture's "Got to Be NC" program, the Hillsborough-based "Piedmont Grown" program, the SEED Foundation's "Buy Fresh Buy Local" program, and South Carolina's "Certified South Carolina" campaign. In addition, the CONNECT Our Future region is already home to several annual food and farm events (e.g., the Charlotte area's Know Your Farms Tour, the Statesville Pumpkin Fest, the York County Ag+Art Tour) and to active Farm to Institution programs.

There is growing demand for local food sourced from local farms across all markets, from direct to consumer to the largest regional grocery chains. This report looked at existing food system infrastructure within the region to identify the businesses that currently serve as intermediary steps in local food supply chains, including value-added processors, fresh produce wholesaler/distributors, multi-farm CSAs, food hubs, and more. The assessment mapped existing infrastructure through a Geographic Information Systems (GIS) platform and provides county and regional-level food system stakeholders with an online tool to evaluate food system assets and needs within their communities (www.cefs.ncsu.edu/connect-map.html).

Despite the increasing demand and interest in local food systems development, the research documents issues related to food inequity and lack of food access for specific segments of the region's population. In the CONNECT Our Future project region an estimated 16 percent of the population lives in poverty, 16.8 percent are food-insecure, and 16.7 percent participate in the Supplemental Nutrition Assistance

Program (SNAP). The research did identify a variety of food assistance programs that work to help residents struggling with food insecurity acquire the food they need. Even so, addressing the root of inequity in the food system requires a larger strategy focused on building local wealth and raising people out of poverty.

With targeted promotion and outreach, strategic planning around food system equity and access, and improvements in local infrastructure to accommodate more local products, there is ample room to grow markets, welcome new farmers, and increase all residents' access to local fresh foods in the project region. By creating a strong community-based food system we foster vibrant farms, healthy people, strong communities, healthy ecosystems, and thriving local economies, all of which lead to overall prosperity for every community in the region.

Summary of Recommendations

Bring Food System Issues to the Forefront of Regional Planning

- Engage in innovative agricultural policymaking to create supportive environments for farming and local food sales.
- Review regulations already in place that may be hindering the production or sale of locally produced farm products.
- Examine laws that may prohibit residents from engaging in agricultural pursuits (e.g., community gardens, keeping chickens or bees) within city limits.

Support Farmers and Local Food Production

- Support farmers' efforts to satisfy local demand by providing training and assistance to help them market their products directly to

consumers and to retail and institutional buyers.

- Collaborate with organizations that have the resources and knowledge needed to help new and beginning farmers; find ways to help them expand their capacity to reach more individuals.

Connect Residents to their Food System

- Support direct marketing channels by promoting existing outlets, assisting with their expansion, or by providing workshops and training for farmers on relevant topics – salesmanship and display, food safety best-practices, food regulation, marketing, and promotion.
- Increase consumer knowledge and awareness of where food comes from, how it is produced, the impacts of the food system on communities and the environment, and the relationship between food and personal health through farm tours, farmers markets, farm festivals, public gardens, and public awareness campaigns.
- Partner with local media (television, radio, newspapers) and marketing agencies to promote what is being grown in the area and where it is being sold.

Address Equity and Access in the Food System

- Address the lack of equity in the food system by shifting to solutions based on lifting people out of poverty, while continuing to address the immediate needs of people in hunger.
- Investigate methods for increasing the accessibility of local fresh foods by making these foods more available in the places where low-income community members already shop.

- Conduct community outreach about the availability of local food options.
- Increase awareness of where low-income community members can use their SNAP benefits to purchase local foods.
- Organize opportunities to help less mobile residents access the transportation they need to shop for food.
- Build capacity of markets that sell locally grown foods to accept SNAP benefits.

Foster Communication and Collaboration

Among Diverse Stakeholders

- Collaborate with leaders of the smaller communities within the CONNECT region from the very beginning.
- Engage stakeholders (e.g., farmers, food entrepreneurs, food industry buyers, decision makers, agriculture specialists, health and human services representatives) in formative planning processes. This step will promote project buy-in and simultaneously identify sources of local knowledge, capacity, and resources.
- Empower stakeholders with the means to increase their own abilities to work effectively.
- Access residents' desire to support local farms and the local economy.

Conduct Additional Research

- Conduct additional research in the region to identify how residents define local, the messages and values that resonate most with them, and to determine the communications channels they use most often.
- Partner with local media to deliver clear and consistent messaging that mirrors the values

and benefits residents associate with buying local food and supporting local farms (as revealed in the research findings).

- Conduct ongoing research to deepen the understanding of how food is moving around the region, what the capacity and opportunity is for infrastructure for local food distribution, processing, etc., and where gaps exist that may be barriers to further local food system development.
- Conduct further research to determine ways to improve the efficiency of food waste disposal in the region.
- Conduct additional research on strategies to increase food access and decrease inequity in the food system.

Section 1: Description of Project Region

The Project Region

The CONNECT Our Future project region is comprised of 14 counties across North and South Carolina including Anson, Cabarrus, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly, and Union counties in North Carolina; Chester, Lancaster, Union, and York counties in South Carolina; and the Catawba Indian Nation (see Figure 1 on page 39 of this report). The project region centers around Mecklenburg County, specifically the Charlotte metropolitan area, the largest metropolitan statistical area in the Carolinas.

The 14-county region includes a mix of rural and urban communities that provide diverse economic

opportunities for the region's 2.5 million residents. Mecklenburg County is the most populous county in the region, accounting for nearly 40 percent of the overall population with just under one million residents. However, in terms of geographic size, York County is the largest county in the region at 681 square miles, or 10 percent of the CONNECT Our Future project region's land area. Almost a third of the project region's nearly 7,000 square miles is devoted to agricultural production (29 percent), with Union County in North Carolina containing the largest proportion of farmland acreage in the region (14 percent). Altogether, the project region accounts for 9 percent of the total land area and 9.5 percent of all farmland in the Carolinas.

Geographic Location

Nestled in the heartland of the Carolinas, the CONNECT Our Future project region is characterized by its diverse topography of rolling hills interspersed with mountain ridges, lakes, and old growth forests. The diverse terrain and temperate climate allow area agricultural producers to grow a wide range of products.

Agriculture and food businesses in the project region benefit from the Greater Charlotte area's position as a transportation and business hub. According to the Charlotte Chamber of Commerce, Charlotte is the center of the largest consolidated rail system in the United States, and it is a leading wholesale center with the nation's top per capita sales. Together, these types of infrastructure have contributed to Charlotte's success as a major financial, distribution, and transportation center.¹ Though the project region is

¹ "Business Community Profile: Charlotte Overview," Charlotte Chamber of Commerce, last modified February 2011, <http://charlottechamber.com/eco-dev/charlotte-overview/>.

landlocked, market opportunities abound through the facilitation of the rail system, major north-south and east-west interstate arteries, and Charlotte's international airport.²

Major Economic Drivers

The five largest employers in the CONNECT Our Future project region are Carolinas HealthCare System, Wells Fargo Bank, Bank of America, Charlotte-Mecklenburg Schools, and the City of Charlotte.³ Across all of the counties in the region, education and health services industries employ the largest number of individuals, followed by manufacturing firms.

Healthcare, manufacturing, and energy are the largest industries in the project region but in terms of economic productivity, the banking sector accounts for a disproportionate amount of generated revenue. Charlotte is the second largest financial center in the nation after New York with more than \$2.3 trillion in assets.⁴ There are 270 Fortune 500 companies represented in Charlotte,⁵ and the city is home to over 4,000 million-dollar corporations.⁶

Demographics

Approximately 80 percent of residents in the project region live in urban areas and 20 percent live in rural

² Ibid.

³ "Workforce In-Depth," North Carolina Employment Security Commission, accessed September 25, 2013, <http://esesc23.esc.state.nc.us/WorkForceInDepth/>.

⁴ "Business Community Profile: Charlotte Overview."

⁵ "Charlotte's Economy & Demographics," Charlotte Chamber of Commerce, accessed September 25, 2013, <http://charlottechamber.com/eco-dev/charlotte-s-economy-demographics/>.

⁶ "Million Dollar Corporations in 2012 Total 4,277," Charlotte Chamber of Commerce, accessed September 25, 2013, <http://charlottechamber.com/business-profile/million-dollar-corporations-in-2012-total-4-277/>.

areas.⁷ An age breakdown of the population reveals that the largest age category is residents 19 years of age or younger, though over half of the population falls within the prime workforce ages of 20 to 60.⁸

In terms of educational attainment, the region's residents have higher high school graduation rates and higher rates of post-secondary education than the North Carolina and South Carolina state averages. High school graduation rates in the project region are 85 percent (compared to 84 percent for the state averages) and post-secondary education rates are 29 percent (compared to the North Carolina and South Carolina averages of 27 percent and 24 percent respectively).⁹

The racial diversity of the project region is comparable to the Carolinas as a whole with 63 percent of the population reporting that they are white, 23 percent reporting black, and 9 percent reporting Latino. The region is also home to the Catawba Indian Nation, a federally recognized native tribe with approximately 2,800 enrolled members.¹⁰ The most recent U.S. population census lists 1,343 residents living on the reservation, 1,054 of whom recorded their race as "white."¹¹

Health of the Population

The most current health data for the counties in the CONNECT Our Future project region indicates high rates of diet-related illness in the population, as seen

⁷ "State and County QuickFacts," United States Census Bureau, accessed September 25, 2013, <http://quickfacts.census.gov/qfd/states/37000.html>.

⁸ "American Bentley," United States Census Bureau, accessed September 25, 2013, <http://factfinder2.census.gov/>.

⁹ "State and County QuickFacts," United States Census Bureau.

¹⁰ "Catawba Today," Catawba Indian Nation, accessed October 2, 2013, <http://catawbaindian.net/about-us/catawba-today/>.

¹¹ "2007-2011 American Community Survey," United States Census Bureau, accessed September 25, 2013, <http://factfinder2.census.gov/>.

in Table 1 on page 32 of this report.

Compared to the nation, the CONNECT Our Future project region has a higher rate of diagnosed diabetes (9.7 percent compared to a national average of 8.5 percent), a considerably lower rate of obesity (27.7 percent compared to the national average of 35.7 percent), and, though a regional average is unavailable, the counties in the region generally exhibit higher rates of diagnosed high cholesterol compared to the national average of 33.5 percent.¹²

Elevated incidences of diet-related illness in the population are evident in the region's morbidity data. Reflecting national trends, diseases of the heart are the leading cause of death in six of the 14 counties and the second leading cause of death in the remaining eight counties. According to the Centers for Disease Control and Prevention, diseases of the heart include hypertensive heart disease, ischemic heart diseases, atherosclerosis, and other diseases where high cholesterol is one of the major risk factors.¹³

Section 2: Regional Local Food Supply

Farming in the Project Region

According to the most recent U.S. Department of Agriculture (USDA) Census of Agriculture, which reports data from 2012, the CONNECT Our Future project region is home to 9,721 farms and 14,396

¹² National averages come from the Centers for Disease Control and Prevention Diabetes, Obesity, and Cholesterol Facts website, <http://www.cdc.gov/>.

¹³ Donna Hoyert and Jiaquan Xu, "National Vital Statistics Reports," U.S. Department of Health and Human Services Centers for Disease Control and Prevention National Center for Health Statistics National Vital Statistic System 61, no. 6 (2012), http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_06.pdf.

farmers. This is a 3.7 percent loss in farms and a 2 percent loss of farmers from the 2007 Census figures. The loss in farms mirrors the national trend; between 2007 and 2012 the Census of Agriculture reported a 4 percent drop in farm numbers for the country as a whole. Table 2 (see page 33) illustrates the distribution of farm size by acreage in the region based on the 2002, 2007, and 2012 censuses of agriculture. Small-to-mid-sized farms between 10 and 180 acres were the most common in all census years, accounting for 76 percent of all farms in 2002 and 77 percent of all farms in 2007 and 2012.

In contrast to the loss in the number of farms in the region between 2007 and 2012, Table 2 shows an increase in overall farmland acreage over the same time period. The region saw an increase in small farms of less than 49 acres (+24 percent) as well as large-scale farms of 1,000 acres or more (+6 percent). These increases were able to counterbalance the loss of farms 50 to 499 acres (-30 percent) resulting in an overall slight gain in farmland between 2007 and 2012 (+ 0.5 percent).

Cash Receipts from Farming

According to the 2012 Census of Agriculture, total agricultural receipts reported for the region totaled over \$1.5 billion, a 25 percent increase from the \$1.2 billion reported in 2007. However, across both years far more farms in the region reported low sales figures than reported high sales figures. Table 3 and Figure 2 (see pages 33 and 39 respectively) show that in 2002, 2007, and 2012, the vast majority of farms in the region had sales of less than \$10,000 (74 percent of farms in 2002 and 72 percent of farms in 2007 and 67 percent of farms in 2012).

This pattern of a small number of farms making up a majority of regional agricultural sales is not uncommon. According to the USDA, large farms

account for only 12 percent of all U.S. farms, yet these farms produce 84 percent of the value of farm production.¹⁴

Farm Classifications

The previous sections note that, according to the most recent census data, the CONNECT Our Future project region is home to 9,721 farms. However, the majority of these farms do not produce food products for human consumption. Instead, they produce other crops including hay, grain, or animals like cattle that are born in the area, but are exported out of state to be matured, slaughtered, and transformed into marketable goods. Figure 3 (see page 40) shows the breakdown of the region's farms by the North American Industry Classification System.¹⁵

According to Figure 3, only 4.8 percent of farms in the region are growing fresh fruits and vegetables. As the Census of Agriculture does not distinguish between farms that sell their products to local markets and those that do not, the number of these farms producing for local markets is unclear. It is likely that the bulk of fruits and vegetables grown in the region are not marketed for local consumption, but are sold to wholesaler-distributors. However shifts are occurring in the region with the emergence of local markets for locally grown food.

According to GrowCharlotte, a website featuring local farms producing for local markets, the greater Charlotte area is home to 32 farms, 32 CSA¹⁶

¹⁴ Robert Hoppe and David Banker, "Structure and Finances of U.S. Farms: Family Farm Report, 2010 Edition," USDA ERS Economic Information Bulletin No. (EIB-66) (July 2010): 72, <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib66.aspx#.UnE9MPIPIOE>.

¹⁵ The North American Industry Classification System (NAICS) is a set of designations used by businesses and the governments of Canada, Mexico, and the United States to classify establishments according to the type of economic activity they conduct.

¹⁶ CSA, or Community Supported Agriculture, refers to a system where customers pre-purchase a proportion or "share" of a farm's

programs, and 40 farmers markets engaged in direct sales of local food to local consumers. Though information on the number of farms in the entire project region selling to local markets is not available, research indicates that there are at least 67 farmers markets in the 14 counties (one farmers market for every 38,000 residents) providing local food to local community members.¹⁷ It is the small family farms vending at these markets that form the backbone of production for the region's current local food system.

Considerations for Farm Vitality

To a large degree, the sustainability of a regional food system in the project area will hinge upon the availability of farmers to continue to meet market demand for local food. An important consideration, then, is the age of the current farmer population which, according to USDA, is much older than the average age of the U.S. workforce. According to USDA, the average age of farmers has increased every year since 1978. The average age of all U.S. farm operators has been greater than 50 years of age since at least the 1974 census. The average farmer age in the project region in 2012 was 58.1. For the same year, only four percent of farmers reported that they were under the age of 35.

In 2002, USDA began gathering additional information about farm operator characteristics to help clarify issues related to the aging of the farm population, such as farm succession plans and the extent to which young farmers are replacing older farmers as they retire from farming. The new data indicates that only about 9 percent of all farms nationwide have multiple operators from different generations working on their

farms as farm operators, and the likelihood of having multiple operators is significantly lower for lower income class farms that predominate in the region. As farmers in the region approach ages generally regarded as retirement age, the question of who will continue to farm the land is a pressing issue that will face local agriculture.

Economic Considerations

USDA reports that the net cash farm income for farmers in the CONNECT Project Region in 2012 was \$355,676,000 (up 40 percent from \$254,647,000 in 2007), with farms in the region netting on average \$35,778 (up 42 percent from \$25,220 in 2007).

However, this single averaged figure is a poor indicator of the complex pattern in farm profitability for the project area. Figure 4 (see page 41), for example, shows the proportion of money earned by farms reporting net profits in the 2007 and 2012 census (average of \$71,300 and \$103,900 respectively) compared to those reporting net losses (average loss of -\$10,500 and -\$14,900 respectively).

The extreme difference between the regional average net cash farm income of \$35,778 and the net average of \$103,900 for profitable farms means that there must be a small number of farms in the region netting large cash incomes, but a large number of farms netting small or negative cash incomes. The census data for 2007 and 2012 shows this exact pattern. Figure 5 (see page 42) focuses on the number of farms reporting net gains or net losses for the project region. In 2012, the total number of farms reporting net gains was 3,572 while the number reporting net losses was nearly twice as high at 6,148.

Therefore, while the profitable farms (Figure 5) in the area reported high average gains and gave the region an overall positive production balance, a much larger number of individual farms reported a net loss of

harvest, and receive regularly scheduled portions of the farm's harvested products.

¹⁷ Farmers markets were identified through personal contacts, the USDA Agricultural Marketing Service's Farmers Market Search directory, and general internet searches.

money. According to a 2013 report on U.S. farm income by the Congressional Research Service, small farms, like those that predominate in the CONNECT Our Future project region, often receive little or no income from farm-related product sales. These farm families often have a total household income level that qualifies them as limited-resource farms (i.e., household income does not exceed the national poverty level for a family of four, or is less than half the county median household income in each of the 2 years prior).¹⁸

Nevertheless, while it is not uncommon for farms to report net cash income losses, this category of data alone does not fully account for farm profitability. Farm operations are afforded many federal tax breaks and write-offs, and small farms often maximize benefits, using business expenses to offset income. In addition, the Census of Agriculture uses tax-based definitions to measure farm profitability and success, measures that are not always accurate, nor necessarily the best measures of farm success. For example, there are a large number of farmers in the Census of Agriculture who do not farm as their primary occupation and who earn an undisclosed amount of money from off-farm jobs which are not reported in the census. Some farms stay in farming for reasons other than supporting the family income, such as continuing a family tradition, maintaining a rural lifestyle, or so that they can access tax breaks given to farms through programs like Current Use Valuation, which taxes farm property at a lower rate than non-farms.

Regardless, long term sustainability of the farm sector depends on the ability of regional farms to make money. The ability of individual farms to earn a profit depends on their capacity to increase total revenues and/or lower total costs, and local markets in local

food systems are an important means of achieving these goals.

Opportunities in the Local Market for Locally Grown Food

Despite national trends toward consolidation of the food system, other national trends demonstrate the growth in local, decentralized markets. According to an August 2013 USDA news release, local food sales through direct and intermediate markets, worth an estimated \$1 billion in 2005, grew to \$4.8 billion in 2007 and reached nearly \$7 billion in 2012.¹⁹ National market research by firms like the Hartman Group and JWT Advertising have tracked the shift in consumer demand to favor locally grown foods, with organizations like the National Restaurant Association and National Grocers Association naming locally sourced foods as top trends in 2012 and 2013.²⁰

Evidence of the interest in local food in the CONNECT Our Future project region is found in various studies and surveys conducted with residents and businesses, which document high and consistent demand for local food products. For example, in their 2012 study of South Carolina consumers, researchers Willis, Carpio, and Young found that the majority of study participants prefer locally grown products to out-of-state products.²¹ Another 2012 study conducted by

¹⁹ "USDA Celebrates National Farmers Market Week, August 4-10," USDA Office of Communications, News Release No. 0155.13, accessed October 31, 2013, <http://www.usda.gov/wps/portal/usda/usdamediafb?contentid=2013/08/0155.xml&printable=true&contentidonly=true>.

²⁰ "What's Hot 2013 Chef Survey," National Restaurant Association, accessed October 31, 2013, <http://www.restaurant.org/Downloads/PDFs/News-Research/WhatsHotFood2013.pdf>.

²¹ David B. Willis et al., "Consumer Willingness to Pay for Locally Grown Produce Designed to Support Local Food Banks and Enhance Locally Grown Producer Markets," *Journal of Agriculture, Food Systems, and Community Development* 15 (2013),

¹⁸ Randy Schnepf, "US Farm Income," Congressional Research Service (2013), <http://www.fas.org/sgp/crs/misc/R40152.pdf>.

CFSAs with North Carolina food businesses found that, among businesses surveyed, business managers prefer locally-sourced products (e.g., tomatoes) over non-local alternatives when the local products are in season.²² Anecdotal evidence too shows demand for locally grown products. The restaurants Veres and Parsons in Charlotte both began as food trucks but moved to brick-and-mortar establishments to accommodate expanding interest in their local fare.²³ This evidence is a clear manifestation of consumer desire for local food and of the current momentum around local food systems development in the project region.

In addition to local opportunities for the area's producers to sell their products to residents, the City of Charlotte itself – which accounts for over half of the land area of the county – is a potential multi-million dollar market opportunity for CONNECT Our Future region producers to tap into urban demand for local food. Of the 14 counties in the project region, Mecklenburg County contains the fewest number of farms (237 in 2012), but as the 17th largest city in the United States, Charlotte contains the largest population of any city in the region at nearly one million people. Each year, Charlotte's residents spend an estimated \$156 million on fresh fruits and vegetables, which is almost two times the retail value of all fruit and vegetable products sold by producers of the CONNECT Our Future project region combined.^{24,25}

<http://ageconsearch.umn.edu/bitstream/150288/2/Willis%20et%20al%20AAEA%202013R.pdf>

²² Taylor Sisk et al., "Organic Produce Marketing Survey," Smithsonian Mills, Inc. (North Carolina: 2013): 17.

²³ Taylor Sisk et al., "Organic Produce Marketing Survey," 7.

²⁴ "Table 3123. Southern region by income before taxes: Average annual expenditures and characteristics, Consumer Expenditure Survey, 2011-2012," U.S. Bureau of Labor Statistics (2013), www.bls.gov/cex/2012/CrossTabs/regbyinc/xregns.PDF.

Mecklenburg County is also the most visited county in North Carolina. In 2012, visitors to Mecklenburg County spent over \$4.4 billion.²⁶ According to tourism research firm Global Insight, food accounts for the largest percentage of spending by North Carolina visitors, representing approximately 73 percent.²⁷ Therefore for 2012, visitors to Mecklenburg County spent an estimated \$3.2 billion on food during their visit, providing additional opportunities for the project region to market local food options to visitors and to generate added economic opportunity for local food producers and food businesses.

Local Food Production

No matter how large the demand for locally grown food grows, however, there is an upper limit to the amount of local product visitors, residents, and businesses can purchase from regional growers based on climate and soil-related limitations. Local farmers cannot supply 100 percent of the produce desired by local customers, because they cannot efficiently grow avocados, lemons, or bananas, for example, no matter how much local food infrastructure is improved. They can, however, grow 19 different types of fruits and vegetables that account for over 48 percent of the fresh fruits and vegetables most commonly consumed

²⁵ Combined retail value of all fruits and vegetables grown in the CONNECT Our Future project area is calculated as the 2012 Census reported wholesale value of sales multiplied by an average produce retail mark-up of 3. Charlotte resident spending (\$156 million) divided by retail value of production (\$97 million) yields 1.6.

²⁶ Laura Hill, "Visitor Spending Increases to \$4.4 Billion in Mecklenburg County and More Than \$5.7 Billion in Charlotte Region," Charlotte Regional Visitors Authority (2013), <http://www.crva.com/news/newsroom.aspx>.

²⁷ "How Important is Tourism in North Carolina: The Tourism Satellite Account Perspective," Global Insight (North Carolina: 2006): 15, <http://www.ncommerce.com/LinkClick.aspx?fileticket=bmxDyvsTXOk%3D&tabid=1547&mid=4666>.

by the region's residents.²⁸ Table 4 (see page 34) lists these 19 items along with their corresponding share of total retail produce sales by American shoppers in 2012.

Tables 5 and 6 (see pages 35 and 36) show production and consumption estimates for the 19 fresh fruits and vegetables in addition to meat and dairy items also produced in the CONNECT Our Future project region. The column labeled "Acres in Production" shows the current capacity for production of fresh goods as of 2012. The column titled "Sufficient to Supply (x)% of the Local Population" is a calculation to estimate, based on per capita consumption of each fresh food item by area residents, the approximate amount of local demand that could be supplied by local production.

What is clear from Table 5 is that for some of the fresh fruits and vegetables grown in the region, there is significantly more demand (consumption) than supply (production). For certain produce items, however, regional production levels far surpass regional consumption levels.

Table 6, like Table 5 shows nearly an even split with some animal products being produced in quantities lower than regional demand (i.e., beef and milk) but others grown in quantities much larger than what the local population consumes per year (i.e., turkey and chicken).

Though Tables 5 and 6 show large quantities of local food production in the region, as stated previously, a large majority of these products are not marketed to local residents but are sold to distant markets through complex national and global food supply chains. The challenge for local food system developers and the CONNECT Our Future project is to research and understand the intricacies of this system and conduct

strategic interventions that boost the capacity of local producers to grow for and supply local consumers through local markets.

Local Food Infrastructure Inventory

The CONNECT Our Future Local Food Infrastructure Inventory is a tool for local governments and community groups to use in combination with additional data – such as that contained in this assessment report – to understand and develop a strategy for developing their local food systems. The CONNECT Our Future Local Food Infrastructure Inventory can be found at www.cefs.ncsu.edu/connect-map.html. Figure 6 (see page 43) shows a map of the entities inventoried throughout the CONNECT Our Future project region at the time of completion of this report, and can also be found online at www.cefs.ncsu.edu/connect-map.html.

The inventory includes businesses that serve as intermediary steps in local food supply chains such as value-added processors (e.g., fruit and vegetable processing, meat processing, specialty jams, and pickling operations), fresh produce wholesaler/distributors, multi-farm CSAs, food hubs, cold storage, and community kitchens. The data collection began with a business entity list from Dun & Bradstreet,²⁹ which was cleaned and amended using online sources (such as information from the North Carolina and South Carolina Departments of Agriculture). Researchers then supplied the list to Extension field staff and economic development personnel in each of the 14 counties and the Catawba Nation so that on-site observations could confirm or

²⁸ Lori Fairchild, ed., "The 2012 Produce Availability & Merchandising Guide," (Vance Publishing Corporation: 2012).

²⁹ Dun & Bradstreet is a public business that licenses information on companies for the purposes of making credit decisions, business-to-business marketing decisions, or conducting supply chain management. The firm is the originator of the Data Universal Numbering System (DUNS). For this inventory, businesses included in the inventory met the following NAICS codes: 311, 4244, 49312.

refute the presence of identified businesses. Three attempts – two emails and one phone call – were made to each individual to collect their amendments and corrections to the listings. Researchers mapped these amended/corrected listings, sent them for final approval to county-level staff in each of the 14 project counties, and then posted the mapped listings online for public input.

The inventory was designed to provide county or regional-level food system stakeholders with a visual tool, a means to “see” the status of intermediary elements in the supply chain. Users can also easily download the data directly from the website. The listings will remain active through the duration of the CONNECT Our Future food systems planning initiative, with new entities accepted via the *Add Location* page. Entities submitted to the database via the *Add Location* page will be vetted by project staff and uploaded to the database and mapped if appropriate. Upon conclusion of the project, the North Carolina information will continue to reside as a mapped database in the statewide NC Local Food Infrastructure Inventory.

Equity and Access

Equity in the food system refers to the degree to which cultural, geographic, economic, and institutional variables affect individuals’ abilities to obtain adequate, nutritious foods.³⁰ The most significant cause of food inequity in any location is poverty. Individuals and families living in poverty disproportionately have difficulty accessing the food they require to live healthy, active lives. While food assistance and hunger relief programs provide relief to individuals and families experiencing food

³⁰ Barbara Cohen, “Community Food Security Assessment Toolkit,” Economic Research Service (2002), http://www.uc.edu/cdc/urban_database/food_resources/community_food_security_assessment_USDA.pdf.

insecurity and hunger, long term systemic solutions must tackle this key root cause and bring people out of poverty. In the CONNECT Our Future project region, an estimated 16 percent of the population lives in poverty (nearly 401,500 people).³¹ This figure is slightly higher than the national estimate of 14 percent, or 45 million people, living in poverty in 2012.³²

Equity and the Dominant Food System

While there are multiple factors that contribute to poverty, the dominant industrialized food system is itself a significant source of poverty and therefore food insecurity.³³ There is extreme pressure within the food industry to keep the price of food low and margins tight. Labor, being the single largest category of food production and delivery expense, is therefore tightly controlled. According to the Bureau of Labor Statistics, seven of the 10 lowest paying jobs in the country are in food preparation, food service occupations, farm work, and farm labor; around half of all U.S. workers paid at or below the Federal minimum wage are employed in the leisure and hospitality industry, specifically in restaurants and

³¹ Vince Breneman and Jessica Todd, “Food Environment Atlas,” last modified September 18, 2013, <http://www.ers.usda.gov/data-products/food-environment-atlas.aspx#.UnkW0fPIOE>.

³² “State and County QuickFacts,” United States Census Bureau (2010), <http://quickfacts.census.gov/qfd/states/37000.html>.

³³ Food insecurity was originally defined under the U.S. Food Security Measurement Project in response to the National Nutrition Monitoring and Related Research Act of 1990 (NNMRR). Food insecurity is defined as a household-level economic and social condition of limited or uncertain access to adequate food. A related measure is “hunger,” which refers to an individual-level physiological condition that may result from food insecurity. For more information: http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx#.UmaSZ_IPIOE.

other food service.³⁴

In the CONNECT Our Future project region, an estimated 10 percent of employed adults work in the food industry and on average earn less than the average salary of residents in the region as a whole. The average annual wage for residents as a whole in the project region is \$27,500 compared to farmworkers and laborers in the region who earn \$22,590 per year, animal slaughter and processing workers who earn \$23,140 per year, and food preparation and service workers who earn \$20,830 per year.

Inequity in the CONNECT Our Future Project Region

As of 2011, the most recent year of measure, approximately 16.8 percent of residents in the CONNECT Our Future region were food-insecure. For the same year, an estimated 403,772 (16.7 percent) of residents participated in the Supplemental Nutrition Assistance Program (SNAP) and 67,680 (2.8 percent) participated in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).^{35,36} Both are federal food assistance programs that provide financial assistance for low-income individuals to help them purchase food. According to data from USDA's Food Environment Atlas, SNAP and WIC participants received nearly \$652 million in benefits in 2011 to purchase authorized groceries.

³⁴ "Characteristics of Minimum Wage Workers: 2011," United States Bureau of Labor Statistics (March 2, 2012), <http://www.bls.gov/cps/minwage2011.htm>.

³⁵ Vince Breneman and Jessica Todd, "Food Environment Atlas."

³⁶ The USDA's Economic Research Service provides household food insecurity data, as well as SNAP participation rates, for counties as state aggregated averages. For 2011, North Carolina's average food insecurity rate was 17.1 percent and the SNAP participation rate was 16.5 percent. For the same year, South Carolina's average food insecurity rate was 14.8 percent and SNAP participation rate was 18 percent (last modified September 18, 2013).

Federal and state data on the rates of residents' food insecurity, hunger, and reliance on food support programs provides evidence of the connection between poverty and food insecurity in the region. Figure 7 (see page 44) shows the distribution of 87 census tracts that have been identified as "food deserts" by USDA's Food Access Research Atlas (15 percent of all census tracts in the CONNECT Our Future region).³⁷ The food desert designation uses a mixture of income levels and proximity to supermarkets, supercenters, or large grocery stores to define low food access. When a census tract's predominant population is low-income individuals and there is also a dearth of food retail options, that tract is identified as a food desert.

The residents of the project region are aware that food insecurity and poverty are pressing issues in their communities. In a 2011 community survey, Anson County residents noted that poverty was a serious local issue and that low wages were limiting families' abilities to maintain food security.³⁸

In their in-depth look at food deserts in Mecklenburg County, researchers Racine, Wang, and Wilson verified the relationship between poverty and access to full-service food stores in the county. Their research found that "having more non-full-service stores compared to full-service stores is more common in lower income areas."³⁹ In other words, the ratio of non-full-service stores – such as corner stores or convenience stores – to supermarkets is much higher in low-income

³⁷ Michele Ver Ploeg and Vince Breneman, "Food Access Research Atlas," last modified May 8, 2013, <http://www.ers.usda.gov/data-products/food-access-research-atlas.aspx>.

³⁸ Bill McCoy and Linda Jacobs Shipley, "Community Needs Assessment: Change for Good Begins Here" (Charlotte, NC: 2011), http://ui.uncc.edu/sites/default/files/pdf/2011_UW_Needs_Assessment_Full_Report.pdf.

³⁹ Elizabeth Racine, Qingfang Wang, and Christina Wilson, "Mecklenburg County Food Assessment 2010" (Charlotte, NC: 2010): 16.

neighborhoods than higher income neighborhoods. This means that community members in low-income neighborhoods in Mecklenburg county often live in food environments where access to less healthy convenience foods is greater than access to healthy, fresh foods.

The CONNECT Our Future region is home to a variety of food assistance programs that work to help residents struggling with food insecurity acquire the food they need. In the fall of 2013, the CEFS conducted a series of focus group meetings with local food systems stakeholders in the area to better understand the resources available in local communities, including those related to food assistance programs. Both the focus group participants and the food system stakeholders surveyed for this assessment (health and human services professionals, agricultural support personnel, food buyers) identified a number of existing programs, services, and businesses that support food access for low-income individuals in the CONNECT Our Future project region, including food banks, food pantries, crisis ministries, meal delivery services, farmers markets, mobile markets, community gardens, and food assistance benefits programs like SNAP and WIC. Table 8 on page 37 of this report lists a sampling of these programs.

These same stakeholders also identified programs, services, and businesses that are currently absent in their area but that should be investigated to support increased food access. The number one response was transportation opportunities, followed by community gardens. Respondents also named mobile markets, a local food promotional campaign, access to farm stands, and food diversion to those in need as potential opportunities.

Other Equity and Access Factors to Consider

Food availability is not the only factor that influences

resident food purchasing behavior. When it comes to food choices, perceptions around social and cultural acceptability, knowledge of food and nutrition, methods of food preparation, and life experiences all play vital roles. In a 2008 study by Wiig and Smith,⁴⁰ for example, researchers found that if food stamp allowances were raised, low-income single mothers spent the extra money on meat, particularly low quality, high fat meats like hot dogs and ground beef, and spent less on fruits and vegetables. Researchers determined this is because, among American families, meat is seen as a high status symbol and is thought of as a superior source of nutrition.⁴¹ In this example, even though fruits and vegetables were available, single mothers preferred to purchase meat based on their perception that meat products are more desirable.

In addition to cultural and social perceptions around food and eating, access to information can also play an important role in food purchasing choices. While the link between education and healthy eating is not fully understood, food systems and nutrition researchers have documented a correlation between lower levels of educational attainment and low consumption levels of fresh fruits and vegetables.^{42,43,44} These researchers

⁴⁰ K. Wiig and C. Smith, "Grocery Shopping on a Food Stamp Budget and Factors Influencing Food Choice Among Low-Income Women," *Journal of the American Dietetic Association* 108, no. 9 Supplement (2008): A24.

⁴¹ Antoinette M. Sangye, "Barriers to Consuming Healthy Food and the Role of Food Pantries in Improving Diets on Low Income Families," Wright State University CORE Scholar (2013).

⁴² C. Aguiar et al., "Federal Nutrition Assistance at Farmers Markets: Evaluating Self-Efficacy and the Home Nutrition Environment" (2013), <http://onlinelibrary.wiley.com/doi/10.1002/cbdv.200490137/abstract>.

⁴³ S. Casagrande et al., "Have Americans Increased Their Fruit and Vegetable Intake? Trends Between 1988 and 2002," *American Journal of Preventive Medicine* 32, no. 4 (2007): 257-263.

⁴⁴ M.A. Horodyski et al., "Low-Income African American and Non-Hispanic White Mothers' Self-Efficacy, 'Picky Eater' Perception, and

theorize that low-income individuals may be less aware of the foods that make up a healthy diet, or that people with low levels of education likely earn more modest incomes, which reduces their purchasing power in the marketplace.⁴⁵ Research from a Community Needs Assessment prepared by the UNC Charlotte Urban Institute for United Way of Central Carolinas⁴⁶ identifies community education as “the most important and encompassing need in the UWCC region.”⁴⁷ The report notes that a lack of knowledge leads to a lack of awareness of the issues related to the social well-being of the community, and perpetuates misperceptions and negative stereotypes that can limit a community’s receptivity to change. Though this report is not specifically referring to issues around food or farm knowledge, the same basic principles apply where, when people are well informed and understand the consequences of their actions, they are more likely to take deliberate, positive actions, including those involving food choices.

In addition to social and cultural perceptions and access to information, research from the health sciences demonstrates that food habits and preferences are directly impacted by positive and negative experiences. Preferences for food develop in positive contexts, and aversions to foods develop in negative contexts. An application of this principle would be that children and adults who have positive experiences with local farms and food tend to develop

an appreciation for local food and farms. Farm field trips, cooking demonstrations with seasonal ingredients, local food tastings, meet-the-farmer events, school gardens, and other hands-on activities engage participants positively with local agriculture. Kids and adults participate in planting and harvesting activities, learn to cook with seasonal ingredients, learn about the cycles of agriculture and the seasonality of crops, meet farmers growing food in their communities, and try new fruits and vegetables. These types of positive experiences influence the formation of food preferences and eating habits, develop local food and farm advocates, and, in the long term, create healthier individuals and communities.

Focus group participants reported numerous regional programs designed to provide local residents with positive experiences with local farms and food, including: farms tours, such as the Ag + Art Tour in York County, S.C.; community dinners, such as Meet Up to Eat Up, which is sponsored by the Foothill Farmers Market in Cleveland County; community gardens, such as those associated with Carolina Home Grown in Union County; and a variety of classes that focus on recipes and skills related to locally grown food.

In addition to community-wide programs and events, the project region supports a number of organizations and opportunities for food and farm education aimed specifically at school children. Organizations like the nonprofit CharMeck Farm to School program in Charlotte and Farm to School Rowan-Salisbury in Rowan County work with schools to provide students with healthy meals in their cafeterias and teach kids about the path food takes from farm to fork while instilling healthy eating habits through hands-on education. Focus group participants also identified the Green Teachers Network, a program designed to help teachers start a schoolyard garden and incorporate garden activities into the curriculum. The program

Toddler Fruit and Vegetable Consumption,” *Public Nursing* 27, no. 5 (2010): 408-417.

⁴⁵ Antoinette M. Sangye, “Barriers to Consuming Healthy Food and the Role of Food Pantries in Improving Diets on Low Income Families.”

⁴⁶ Bill McCoy and Linda Jacobs Shipley, “2011 Community Needs Assessment: Change for Good Begins Here,” (Charlotte, NC: University of North Carolina at Charlotte’s Urban Institute, 2011), http://ui.uncc.edu/sites/default/files/pdf/2011_UW_Needs_Assessment_Full_Report.pdf.

⁴⁷ Bill McCoy and Linda Jacobs Shipley, “2011 Community Needs Assessment: Change for Good Begins Here,” 4.

was launched by the Catawba River District, and includes educators from Gaston and Mecklenburg schools, Cooperative Extension offices, the Mecklenburg Health Department and other nonprofit groups as partners.

Food Waste Management

Food waste is an important aspect of a regional food system. USDA's Economic Research Service estimates that 133 billion pounds of food, or 31 percent of the 430 billion pounds of food available for human consumption in the United States, is wasted each year.⁴⁸ This represents a loss of more than \$160 billion worth of food each year, as well as the energy, land, water, and chemical inputs used to grow this food.⁴⁹ In addition, the majority of this uneaten food ends up decomposing in landfills, where organic matter accounts for 16 percent of U.S. methane emissions.⁵⁰ Recovering just 15 percent of the food that is wasted each year, for example, would provide enough food to feed more than 25 million Americans (at a time when one in six Americans suffer from food insecurity).⁵¹

As population growth leads to increased pressures on agricultural land and other resources, a system of food waste recovery and disposal can help to make better use of natural resources, reduce environmental impacts, provide opportunities for financial savings and entrepreneurship throughout the food supply

⁴⁸ Jean C. Buzby, Hodan Farah Wells, and Jeanine Bentley, "ERS's Food Loss Data Help Inform the Food Waste Discussion," USDA Economic Research Service (June 3, 2013), <http://www.ers.usda.gov/amber-waves/2013-june/ers-food-loss-data-help-inform-the-food-waste-discussion.aspx#.UgpRwdLBNIV>.

⁴⁹ Ibid.

⁵⁰ Dana Gunders, "Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill," Natural Resources Defense Council (August 2012): 4, <http://www.nrdc.org/food/files/wasted-food-IP.pdf>.

⁵¹ Ibid.

chain, and enhance our ability to meet food demand.

Food Waste in the CONNECT Our Future Project Region

The North Carolina Department of Environment and Natural Resources (NC DENR) estimates that more than 1.1 million tons of food waste are generated within the state each year.⁵² The residential sector is estimated to generate more than 61 percent of this total, or 673,000 tons of food waste annually, with each household generating more than seven pounds of food waste each week.⁵³ The commercial sector in North Carolina generates nearly 570,000 annual tons of food waste, with supermarkets representing the largest single generation source of food waste at 106 annual tons of food waste per store.⁵⁴ In South Carolina, the Department of Health and Environmental Control estimates that the state recycles 1,624 tons of food scraps and 28,952 tons of cooking oil per year, but there is no data at this time on the amount of food waste actually generated within the state.⁵⁵

NC DENR estimates that Mecklenburg County, as North Carolina's most populous county, generates more food waste than any other county in the state at approximately 108,781 tons of municipal solid food

⁵² "North Carolina 2012 Food Waste Generation Study," North Carolina Department of Environment and Natural Resources (August 2012): 3, http://portal.ncdenr.org/c/document_library/get_file?uuid=ae965d91-c5a1-47aa-8f09-9afbfa6598f&groupId=38322.

⁵³ Ibid, 5.

⁵⁴ Ibid, 3.

⁵⁵ "South Carolina Solid Waste Management Annual Report for Fiscal Year 2012," South Carolina Department of Health and Environmental Control (2012): 26, http://www.scdhec.gov/environment/lwm/recycle/pubs/swm_FY12_ALL.pdf.

waste per year.⁵⁶ Food waste is estimated to constitute as much as 15 percent of the total municipal solid waste disposed in Mecklenburg County.⁵⁷ However, Mecklenburg County has demonstrated a continuous commitment to waste reduction within the county and is known for its innovative waste reduction and recycling education programs. According to the county's 2012 Solid Waste Management Plan, Mecklenburg County has already achieved an overall waste reduction rate of 40 percent from its baseline year of FY 1998/1999.⁵⁸ The county seeks to reduce its overall waste by 58 percent by FY 2021/2022, and county officials recognize that increased food waste diversion is essential to reaching this goal.⁵⁹ Food waste statistics for each county in the project region are available in the "County Snapshots" section of this report.

There are various potential means of improving food waste diversion within the CONNECT Our Future project region including edible food recovery, composting, and anaerobic digestion facilities; each of these solutions involves a combination of public and private commitment. The following is an illustration of how some of these solutions are already being employed in the region, as well as areas where there is potential for improvement.

Edible Food Recovery

Community Food Banks and Soup Kitchens

⁵⁶ "North Carolina 2012 Food Waste Generation Study," North Carolina Department of Environment and Natural Resources (August 2012): 16, http://portal.ncdenr.org/c/document_library/get_file?uuid=ae965d91-c5a1-47aa-8f09-9afbbfa6598f&groupId=38322.

⁵⁷ "Mecklenburg County Solid Waste Management Plan 2012-2022," HDR Engineering Inc. of the Carolinas (prepared for Mecklenburg County Land Use and Environmental Services Agency, 2012): 5-2, <http://charmec.org/mecklenburg/county/SolidWaste/ManagementPlan/Documents/MeckCoSolidWasteMgmtPlanJune2012.pdf>.

⁵⁸ *Ibid.*, 2-19.

⁵⁹ *Ibid.*, 2-19, 2-20.

One means of reducing food waste involves the recovery of fresh or prepared food that is suitable for human consumption, often through donation by commercial food businesses to food banks or soup kitchens. Donated items may include unserved food items from restaurants, unsold produce, dairy, and deli items from grocers, unused food from catered events, day-old baked goods from bakeries, and so forth.

There are several food banks providing food to those in need throughout the project region, including Angels and Sparrows, Charlotte Rescue Mission, Dilworth Soup Kitchen, Friendship Trays, Loaves and Fishes, Second Harvest, and Urban Ministry in Mecklenburg County, as well as several other such organizations in neighboring counties. A recent study found that food banks and soup kitchens distribute an estimated 2,100 tons of donated perishable food per year in Mecklenburg County.⁶⁰ The redistribution of edible food through community food banks and soup kitchens constitutes an important part of the food waste solution throughout the Charlotte metropolitan region.

Gleaning

Gleaning is the act of collecting leftover crops from farmers' fields after they have been commercially harvested or on fields where it is not economically profitable to harvest. Because this food would otherwise be left to rot in the fields or plowed under after harvest, some growers allow crews of gleaners to salvage any remaining produce from their fields and orchards after the harvest and deliver it to those in need. There are various reasons that food may be left behind in fields. According to Marilyn Marks, former

⁶⁰ "Mecklenburg County NC Food Waste Diversion Study Final Report," Kessler Consulting, Inc. (prepared for Mecklenburg County Solid Waste, March 2012): 3, <http://charmec.org/mecklenburg/county/solidwaste/homecomposting/documents/food%20waste%20diversion%20study%20final.pdf>.

gleaning coordinator for the Society of St. Andrew's North Carolina office, "The market may have moved on a grower and he can't pay his workers to get the food. Or food that may be too ripe by the time it gets to market may not get picked. Sometimes food is too damaged to sell, but not to eat."⁶¹

Opportunities for gleaning do exist in the project area. The Society of St. Andrew operates a statewide, volunteer-driven Gleaning Network in both North and South Carolina that coordinates with local farmers, volunteers, and food-providing agencies. Volunteers include groups from various church denominations, synagogues, youth groups, other civic organizations, and individuals. The Society of St. Andrew estimates that its North Carolina Gleaning Network salvages over five million pounds of fresh produce for the hungry each year, and that more than 143 million pounds of fresh produce have reached people in need in North Carolina and South Carolina since the Society of St. Andrew opened a North Carolina regional office in 1992.⁶² This impact has been accomplished through the Gleaning Network, the Potato and Produce Project, and the Seed Potato Project, and has resulted in over 429 million servings of food delivered to neighbors in need.^{63, 64}

⁶¹ Lisa Moore, "The Gleaning Network – Gathering Local Crops to End Hunger," *Natural Awakenings*, accessed November 8, 2008, <http://awakeningcharlotte.com/2008/11/08/the-gleaning-network-%E2%80%93-gathering-local-crops-to-end-hunger/>.

⁶² "Serving North Carolina and South Carolina," Society of St. Andrew, North Carolina, accessed November 4, 2013, <http://www.endhunger.org/nc/>.

⁶³ *Ibid.*

⁶⁴ Since 1984, North Carolina farmers have been eligible for a tax credit worth up to 10 percent of the value of gleaned crops donated to charity. However, this tax credit was repealed by the North Carolina legislature in 2013 and will no longer be available to farmers as of January 1, 2014; Jean Blish Siers, "In the N.C. Tax Plan, a Shocking Grab from the Needy," *Charlotte Observer*, accessed July 24, 2013, <http://www.charlotteobserver.com/2013/07/24/4187602/in-the-nc-tax-plan-a-shocking.html#.UoJzq3DBNv4>.

The practice of gleaning is not limited to the farm. The Society of St. Andrew's North Carolina Gleaning Network also salvages surplus produce from vendors at the end of farmers markets and gleans packing houses for produce that does not meet size or appearance requirements. Some gleaning organizations, such as the Glean for the City project in Washington, DC, salvage produce from individuals who may have surplus food to give away from their private gardens or CSA shares.⁶⁵ This practice could also be incorporated into gleaning programs by organizations in the CONNECT Our Future project area.

Gleaning is being modernized throughout the country by social media and technological developments such as Crop Mobster, a website launched in California in March of 2013 to link surplus produce with people involved with food production, hunger relief, and those who want to buy local. Other websites and "apps" are emerging to assist in diverting edible food from municipal waste streams across the country, for example, by connecting large farms with food banks or helping grocery chains to cheaply market edible produce that does not meet the size and quality standards for sale in U.S. supermarkets.⁶⁶ These innovative tools and social media technologies could also be employed in the project region to further improve the effectiveness of gleaning to reduce food waste in Charlotte and the surrounding counties.

Livestock Feed Operations

There are also options for food recovery in the project area involving livestock, whereby food scraps and byproducts may be collected and processed to feed

⁶⁵ "Glean for City: A Project of Bread for the City," *Bread for the City*, accessed November 4, 2013, <http://www.breadforthecity.org/gleanforthecity/>.

⁶⁶ Rachel Dornhelm, "Social Media Helps Farmers Avoid Food Waste," *Voice of America*, accessed July 23, 2013, <http://www.voanews.com/content/social-media-helps-farmers-avoid-food-waste/1707814.html>.

livestock or to produce livestock feed products. These practices may be an appropriate means to divert items that are unsuitable for human consumption such as food prep waste, plate waste, and unpackaged or out-of-date food. There are approximately forty licensed “garbage feeder” operations (feeding food waste to swine) in the state of North Carolina, and one of these is located near the project region in Catawba County.⁶⁷

Composting

For food waste that is not suitable for human or animal consumption, other opportunities remain to sustainably dispose of and convert that waste into valuable resources for the project region. One such method is composting, which not only diverts food waste from landfills, but also breaks down organic waste to produce nutrient-rich soil. By increasing erosion resistance, water-holding capacity, and gas exchange, compost can restore fertility to depleted soils and even raise the value of farmland, supporting local economies in the process. Across the country and in the CONNECT Our Future project region, both commercial and residential composting programs are emerging as an alternative for food waste disposal. Following are examples of composting initiatives taking place in the project region.

Charlotte-Douglas International Airport Vermi-Composting Program

The most prominent example of composting in the project area is the innovative vermi-composting program instituted at the Charlotte-Douglas International Airport (CDIA) in 2012. Housed in a 30,000 square foot building, the CDIA’s vermi-composting system uses worms to process the airport’s organic refuse into nutrient-rich compost. Twenty-five tons of trash a day tumbles onto a

conveyor belt where employees manually separate food waste derived from airport restaurants, trash cans, and airplanes from the airport’s non-compostable waste.⁶⁸ Once the waste streams are separated, recyclables are crushed, baled, and sold, and the organic waste is heated in a giant rotating drum at 160 degrees for three days to kill microbes and pre-compost the trash.⁶⁹ Finally, the organic waste is added to a 50-foot-long composting bin where it is processed by 1.9 million red wiggler worms. Officials estimate that the worms can process up to two tons of airport waste daily.⁷⁰

While it cost \$1.2 million to launch the program, airport officials expect the airport’s vermi-composting operation to be profitable in five years.⁷¹ Aviation Director Jerry Orr has said that the cost of operating the recycling center is about \$425,000 per year, but the airport typically pays approximately \$900,000 per year for its trash to be hauled away.⁷² The composting program has allowed the airport to reduce its waste levels by 70 percent, thus achieving significant savings in waste hauling and landfill fees.⁷³ In addition, the worms’ nitrogen-rich castings will be used to fertilize the airport’s six thousand acres of grounds, enabling the airport to save money in fertilizer costs, and

⁶⁸ Julie Rose, “One Airport’s Trash Is 2 Million Worms’ Treasure,” National Public Radio, last modified December 18, 2012, <http://www.npr.org/blogs/thesalt/2012/12/20/167529920/one-airports-trash-is-2-million-worms-treasure>.

⁶⁹ Ely Portillo, “Worms Munching on Travelers’ Trash at Charlotte Airport,” Charlotte Observer, last modified November 2, 2012, <http://www.charlotteobserver.com/2012/11/01/3637568/worms-munching-on-travelers-trash.html#storylink=cpy>.

⁷⁰ Sarah Shultz, “Charlotte Airport Opens Worm Composting Facility,” Care 2 Make a Difference, last modified January 1, 2013, <http://www.care2.com/greenliving/charlotte-airport-opens-worm-composting-facility.html>.

⁷¹ Ibid.

⁷² Ely Portillo, “Worms Munching on Travelers’ Trash at Charlotte Airport.”

⁷³ Sarah Shultz, “Charlotte Airport Opens Worm Composting Facility.”

⁶⁷ Mecklenburg County NC Food Waste Diversion Study Final Report, Kessler Consulting, Inc., 20.

officials anticipate being able to sell excess compost to area gardeners at some point in the future.⁷⁴

Residential Food Waste Composting

Estimated at 65,853 tons per year, residential food waste in Mecklenburg County comprises a significant waste stream with ample potential for diversion.⁷⁵ In a Food Waste Diversion study commissioned by Mecklenburg County in 2012, Kessler Consulting, Inc. (KCI) found that a mere two to five percent of residential food waste is being recovered through home composting in the county, and a comprehensive residential food waste recovery program could capture another 13,900 to 27,800 tons per year of food waste.⁷⁶

Municipal Composting Options

While some municipalities across the nation such as San Francisco, California and Portland, Oregon have adopted residential food waste collection and composting programs, none of the counties within the project region have adopted such a program. Mecklenburg County has instituted county-wide residential curbside recycling and single family residential yard trimmings collection⁷⁷; it operates four facilities, which accept residential, commercial, and industrial yard waste.⁷⁸ However, the county's compost facility, Compost Central, is not permitted to process food scraps, which means the county cannot

collect or accept food waste.^{79, 80}

While Mecklenburg County does not have a program in place to collect or accept residential food waste for composting, it launched the Mecklenburg County Organic Waste Reduction Program aimed at providing residents with training for home composting in 1993.⁸¹ In 2010, the initiative was renamed to Mecklenburg County's Home Composting Program.⁸² Through this program, the county continues to offer free workshops, which expose students to various methods of residential composting and organic waste reduction. The county also provides a more in-depth Master Composter Program, which teaches advanced technologies of residential and commercial composting and offers on-site visits to commercial composting facilities and compost farms in the area. Results of the 2010 Charlotte-Mecklenburg Annual Survey conducted by Mecklenburg County's Land Use and Environmental Services Agency indicated that 42 percent of residents surveyed were aware of this program.⁸³

The 2012 Mecklenburg County Solid Waste

⁷⁹ "Mecklenburg County Solid Waste Management Plan 2012-2022," HDR Engineering Inc. of the Carolinas, 5-2.

⁸⁰ Compost Central is currently located directly south of Charlotte-Douglas International Airport on roughly 60 acres of property owned by the City of Charlotte. The County has operated Compost Central at this location since 1992 under a land lease agreement with the City. It will need to move the facility by 2015, however, because the airport is expanding its facilities in a way that would essentially bisect the parcel where Compost Central currently operates. The proposed new location for Compost Central operations (and the adjacent West Mecklenburg Recycling Center) is a 50-acre parcel bounded by Rozzelles Ferry Road, Valleydale Road, and Fred Alexander Boulevard in Charlotte. ("Mecklenburg County Compost Central Relocation - Frequently Asked Questions," Mecklenburg County, NC Solid Waste and Recycling, accessed November 7, 2013, http://charmeck.org/mecklenburg/county/SolidWaste/Compost%20Central%20Relocation/Documents/WOW_CCR_FAQ.pdf.)

⁸¹ "Mecklenburg County Solid Waste Management Plan 2012-2022," HDR Engineering Inc. of the Carolinas, 3-9.

⁸² Ibid.

⁸³ Ibid, 5-5.

⁷⁴ Ibid.

⁷⁵ "North Carolina 2012 Food Waste Generation Study," North Carolina Department of Environment and Natural Resources, 16.

⁷⁶ "Mecklenburg County NC Food Waste Diversion Study Final Report," Kessler Consulting, Inc., 4.

⁷⁷ "Mecklenburg County Solid Waste Management Plan 2012-2022," HDR Engineering Inc. of the Carolinas, 1-1.

⁷⁸ "Waste Reduction in Mecklenburg County," Mecklenburg County, NC Solid Waste and Recycling, accessed November 7, 2013, <http://charmeck.org/mecklenburg/county/SolidWaste/Compost-YardWaste/Pages/default.aspx>.

Management Plan noted that a survey was distributed to the seven municipalities in Mecklenburg County to identify collection programs with the potential to include a food scraps diversion program.⁸⁴ As the only municipality with automated collection and cart service through Advanced Disposal, the Town of Huntersville in Mecklenburg County may be the best candidate for a potential residential food scraps pilot study in the future.⁸⁵ The Town of Huntersville has indicated it would consider further discussions regarding the possibility of a residential pilot study.⁸⁶

In addition, focus group participants mentioned a composting facility in Cabarrus County. The facility accepts yard waste from residents and small businesses, as well as the Cities of Concord and Kannapolis. It is operated through a public-private partnership between the county and Agromatters LLC, which hopes to receive a Type 3 compost operating permit from the NC DENR in 2014. The permit would allow them to accept certain types of agricultural waste, meat, and post-consumer food wastes. County staff hopes to eventually utilize the compost at the Elma C. Lomax Incubator Farm.

Private Composting Options

In cities where there is no municipal program to collect or accept food waste, private entrepreneurs are emerging to fill this need. CompostNow, based in Raleigh, is one such company. CompostNow provides curbside collection of organic and compostable materials to residences and small businesses for a weekly or monthly fee, providing its clients with a clean bin each week to store food waste and other compostable items and then collecting this waste weekly for composting. CompostNow offers clients the option of receiving composted soil to use in home

gardening or donating it to a local community garden. CompostNow currently services the Triangle area and Asheville in North Carolina but plans to expand services to Charlotte within the near future.⁸⁷

Commercial Food Waste Composting

The NC DENR estimates that Mecklenburg County generates 55,680 tons of commercial food waste per year.⁸⁸ According to the NC DENR's North Carolina 2012 Food Waste Generation Study, North Carolina's retail food industry, including restaurants and supermarkets, is "a major generator of food waste and a visible target for segregated food waste collection."⁸⁹ While supermarkets and grocery stores generate the most waste on a per-store basis, the restaurant industry is the largest commercial generator of overall food waste throughout the state.⁹⁰ KCI's Food Waste Diversion study found that there is an unmet need for commercial waste recovery in Mecklenburg County, as well as a strong willingness among major commercial food waste generators to consider food waste recovery options.⁹¹

Municipal Composting Options

While there are no municipal composting programs available to commercial waste generators in the CONNECT Our Future project region, Charleston County in South Carolina has instituted a Commercial Food Waste Composting Program which could serve as a model for counties in the Charlotte metropolitan region. Charleston County instituted the program as a pilot program in 2010 and received an operating

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ "CompostNow Community Compost Shuttle," CompostNow, accessed November 7, 2013, <http://compostnow.org/>.

⁸⁸ "North Carolina 2012 Food Waste Generation Study," North Carolina Department of Environment and Natural Resources, 16.

⁸⁹ Ibid, 9.

⁹⁰ Ibid.

⁹¹ "Mecklenburg County NC Food Waste Diversion Study Final Report," Kessler Consulting, Inc., 3.

permit to process food waste in June 2012.⁹²

Charleston County’s composting program gives local businesses the opportunity to reduce their overall waste disposal costs by contracting for collection with specified collectors to divert organic material from their waste streams.⁹³ Charleston County Government does not collect or haul food waste directly but lists five collection partners on its website who can transport food waste for composting to the county’s Bees Ferry Compost Facility for a negotiated fee.⁹⁴ Finished compost may be purchased by the bag or in bulk at the county’s compost facility, allowing South Carolina’s Environmental Management Department to receive an economic benefit through its sale.⁹⁵

According to Mecklenburg County’s 2012 Solid Waste Management Plan, an estimated 67,000 tons per year of unused capacity exists between Compost Central and the county’s private composting facilities, which would provide enough capacity for a food scraps diversion pilot study in the commercial sector.⁹⁶

Private Composting Options

There are a number of private sector food waste composters located throughout the Charlotte region. According to Mecklenburg County’s 2012 Solid Waste Management Plan, there are currently ten private facilities that recycle organic matter within and around Mecklenburg County.⁹⁷ These existing composting operations already work with commercial generators in the Charlotte metropolitan region to

divert over 36,000 tons of food waste from landfill disposal each year.⁹⁸

In its 2012 Food Waste Diversion study, KCI surveyed seven of the private organic recycling facilities in the Charlotte metropolitan area and found that four facilities were interested in receiving new sources of food waste and had the ability to expand their operations for this purpose.⁹⁹ The study found that existing facilities had an estimated 30,400 tons per year of unused capacity.¹⁰⁰ However, the study also showed that almost all of this total potential capacity could be attributed to two facilities: Earth Farms in Gaston County and Wallace Farm in Mecklenburg County.¹⁰¹ Of these two sites, Wallace Farm’s food waste capacity after 2015 is uncertain due to a legal settlement and their need to find a new location for food waste composting.¹⁰²

Anaerobic Digestion Facilities

Anaerobic digestion is another option for processing food waste. Anaerobic digestion is a biological process in which microorganisms are used to break down organic materials in an oxygen-deficient environment, creating a biogas that consists primarily of methane and carbon dioxide.¹⁰³ The biogas produced by anaerobic digestion can be used to produce electricity or can be converted into a transportation fuel.¹⁰⁴ In addition, the remaining semi-solid digestate (comprised of less digestible material) can be sent to a

⁹² “Commercial Food Waste Composting Program,” Charleston County South Carolina Online, accessed November 7, 2013, <http://www.charlestoncounty.org/departments/solidwaste/food-waste-composting-information.htm>.

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ Ibid.

⁹⁶ “Mecklenburg County Solid Waste Management Plan 2012-2022,” HDR Engineering Inc. of the Carolinas, 5-5.

⁹⁷ Ibid, 5-24.

⁹⁸ “Mecklenburg County NC Food Waste Diversion Study Final Report,” Kessler Consulting, Inc., 3.

⁹⁹ Ibid, 21.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ “Mecklenburg County Solid Waste Management Plan 2012-2022,” HDR Engineering Inc. of the Carolinas, 5-26.

¹⁰⁴ Ibid.

compost facility for further processing.¹⁰⁵ With a proper feedstock, anaerobic digestion can reduce waste volumes by approximately 70 percent, providing energy and compost feedstocks in the process.¹⁰⁶

According to KCI's 2012 Food Waste Diversion study, two private anaerobic digestion companies are considering developing commercial scale facilities in or near the CONNECT Our Future project region. If one of these facilities is developed, it could potentially consume some 30,000 tons per year of food waste drawn from a wide radius around Mecklenburg County.¹⁰⁷ In its 2012 Solid Waste Management Plan, Mecklenburg County noted that W2E Columbia LLC reportedly received a solid waste permit from the South Carolina Department of Health and Environmental Control in 2011, paving the way for a \$12 million anaerobic digestion facility to be built in Columbia, South Carolina.¹⁰⁸ The county's Waste Management Plan also noted that the company is planning for an additional facility in Gastonia, North Carolina in the near future.¹⁰⁹

Section 3: Regional Local Food Supply

As related previously, according to a 2013 report from USDA, national local food sales through direct and intermediate markets, worth an estimated \$1 billion in 2005, grew to \$4.8 billion in 2007 and reached nearly \$7 billion in 2012. Agricultural Census data for

2012 further shows an increase in the number of farms, particularly small farms (those less than 50 acres), which reverses a decades-long trend. Both trends reflect the rapidly growing consumer interest in knowing who is growing their food. National market research by firms like the Hartman Group and JWT Advertising have tracked the shift in consumer demand to favor locally grown foods, and according to one estimate, national local food sales have doubled to \$11 billion over the past ten years.¹¹⁰

Evidence of the interest in local food in the CONNECT Our Future project region can be seen in the growth in the number of venues offering local food products. Figure 8 on page 45, for example, shows the growth of direct sales in each of the counties in the project region. As a whole, the 14 counties experienced a 161 percent increase in direct sales from 2002 to 2012, going from \$1.8 million dollars to nearly \$4.7 million dollars.

In addition to direct sales to consumers through farmers markets, roadside stands, CSAs, and u-pick operations, local restaurants and grocers are beginning to source products from local farms to satisfy demand from their customers. In a 2013 local food market assessment of the Charlotte Metropolitan Area, Mecklenburg County Cooperative Extension agent Kristen Davis noted:

The interest of Charlotte-area consumers for local food has increased. As a result, we are experiencing an increase in restaurants who are sourcing local food for their menus, community supported agriculture opportunities, and interest in home-based and small businesses that utilize locally

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ "Mecklenburg County NC Food Waste Diversion Study Final Report," Kessler Consulting, Inc., 22.

¹⁰⁸ "Mecklenburg County Solid Waste Management Plan 2012-2022," HDR Engineering Inc. of the Carolinas, 5-24.

¹⁰⁹ Ibid.

¹¹⁰ "As Americans Rush to Fresh Food, Supermarket Chains Follow," CNBC, last modified October 8, 2012, <http://www.cnbc.com/id/49101716>.

sourced produce and meats.¹¹¹

Charlotte-Mecklenburg Food Policy Council director Anna Brown expressed similar sentiments saying:

We have an extensive network of farmers markets. There are also businesses like Go Local NC Farms with delivery and pick-up options. There are several restaurants that source locally, but certainly [there is] room for growth.¹¹²

In this context, area resources have sprung up to help consumers access the local food products they desire, including the online local food directory Grow Charlotte¹¹³ and local farm listings on the Slow Food Charlotte website.¹¹⁴ The momentum around the idea of local markets serving local products in the Greater Charlotte area is a clear manifestation of consumer desire for local.

Resident Food Consumption and Spending

This section focuses on fresh produce consumption. Fresh produce requires little processing and is therefore more easily produced and marketed through local marketing channels.¹¹⁵ For this reason, a focus on fresh produce consumption and production will yield the most practical assessment of the potential for immediate local food system expansion in the project region.

Based on 2013 population estimates, the residents of

¹¹¹ “An Assessment of the Market for Locally Produced Foods in the Charlotte Metropolitan Area,” Smithson Mills Inc., (Asheville, NC: 2013): 6.

¹¹² Ibid.

¹¹³ “Grow Charlotte,” accessed November 7, 2013, <http://www.growcharlotte.com/>.

¹¹⁴ “Slow Food Charlotte,” accessed November 7, 2013, <http://slowfoodcharlotte.org/farms>.

¹¹⁵ Steve Martinez et al., “Local Food Systems: Concepts, Impacts, and Issues,” USDA Economic Research Service (2010): 97, http://www.ers.usda.gov/media/122868/err97_1_.pdf.

the CONNECT Our Future project region spend \$5.9 billion per year on food. Regional estimates indicate that the average household in the southern U.S. spends 59 percent of total food expenditures on food consumed at home and the remaining 41 percent on food consumed away from home. For the project region, where 2.5 million residents equals an estimated 1 million households, this figure breaks down to \$3.5 billion spent on food consumed at home and \$2.4 billion spent on food consumed away from home.

Looking at Table 9 (see page 38), in 2012 the estimated retail value of resident spending in the project region on a selected variety of fruits and vegetables that can be grown in the region totaled \$665.4 million dollars or about 11 percent of total food purchasing. In comparison, farms in the project region produced an estimated retail equivalent of just under \$97 million dollars of the same fruit and vegetable products. The difference between \$665.4 million dollars in spending and \$97 million dollars of local product represents an opportunity for an expansion of local fruit and vegetable production and local food sales in the CONNECT Our Future region.

Food Dollar Considerations

The percentage of each dollar spent on food that goes to the farmer who produced it differs depending on where food is purchased. For instance, if a farmer sells a product directly to a consumer – at a farmers market, through a CSA, or at a roadside stand – the farmer retains all earnings from that product (though they may have more costs, in labor and marketing for example). On the other hand, in the case of grocery store spending, an average of only \$0.18 of every dollar spent on food goes directly to the farmer. The rest of the dollar pays for the processing, energy, packaging, advertising, salaries, and other expenses that went into getting the product from the farm to the

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shopper's grocery bag. It should be noted that the average proportion of the food dollar a farmer receives varies by product. For example, farmers retain an average of \$0.28 for every dollar spent on fresh fruits and vegetables, but only \$0.17 for processed fruits and vegetables (like canned fruit or juice).¹¹⁶

For away-from-home spending, including food purchases at restaurants, hospitals, parks, workplaces, etc., the average proportion of each food dollar that goes to the farmer decreases significantly to just \$0.03. The majority of the food dollar that makes up away-from-home spending goes toward labor (\$0.74). In terms of the local economy, this means that significant percentages of every retail dollar spent in a local restaurant or grocery store may already be in the local economy in the form of payroll for local employees. Accordingly, calculations of the economic impact of localizing food systems need to be grounded in food dollar economics. While localizing a community's food system will affect the local economy, transitioning to a more locally based food system will not shift the entire food dollar; much of that is already present in the form of community wages. Nevertheless, there are financial benefits that can accrue to local producers and locally owned businesses with the development of local market opportunities.

The impacts of consumer food spending on the local food and farm economy lies in the potential of local sales to increase returns to individual farmers and to keep more of the food dollar with locally owned businesses. Since demand for food stays relatively constant (i.e., there is only so much food people can consume), the primary way for food producers to increase their proportion of earnings is to take over

other sectors of the food dollar. For example in the case of direct marketing, a producer grows, transports, packages, markets, and sells his or her own product and, accordingly, is able to retain 100 percent of the food dollar. In this way, producers can capture a larger proportion of the food dollar by strategically marketing their products to the local population of consumers and food businesses, and can earn larger returns for their products. Likewise, locally owned businesses keep a higher percentage of the food dollar in the local economy by not exporting a percentage of their profits to parent companies that may not be located within the region.

There are benefits other than direct economic impact that accrue to both farms and communities when food systems become localized in the form of improved health, support for local businesses, community vitality and resilience, open space, quality of life, etc. When people become knowledgeable of the food system and begin to understand where their food comes from, extra-economic factors like these are more likely to be elevated and to inform consumer purchases and the price they are willing to pay to uphold these benefits.

Recommendations

This section discusses a number of key areas of opportunity for local food systems development in the project region. The recommendations presented are options, and some are more easily implemented than others. Given regional priorities and resources, stakeholders in the CONNECT Our Future region must decide which recommendations are appropriate for implementation. The Action Plan for Food Systems Improvement articulates specific steps for county and regional food policy councils to prioritize and

¹¹⁶ Randy Schnepf, "Farm-to-Food Price Dynamics," Congressional Research Service (Washington DC: 2013), www.fas.org/sgp/crs/misc/R40621.pdf.

implement.

Bring Food System Issues to the Forefront of Local Government

Food system elements intersect with everything from land and water use planning to transportation, retail development, and waste management. For this reason, it is imperative that policies and regulations related to the functioning of the region’s developing local food system be considered and reviewed to ensure that the region has a supportive atmosphere for farm and food enterprises.

Decision-makers at all levels can engage in innovative agricultural policymaking to create supportive environments for farming and local food sales. An important first step for community stakeholders is to review regulations already in place that may be hindering the production or sale of locally produced farm products and to determine which regulations may need to be modified to allow farm businesses to adapt, innovate, and grow. A growing number of planning tools and legal constructs may be employed to support local food system development, including Voluntary Agricultural Districts (VADS), Present Use Value (PUV) taxing, Extraterritorial Jurisdiction (ETJ), Purchase of Agricultural Conservation Easement (PACE), and Comprehensive Farmland Preservation Plans.¹¹⁷ Many of these tools are already being employed in North Carolina and South Carolina and could also be utilized or enhanced by policy-makers within the CONNECT Our Future project region.

Government bodies also have a unique opportunity to influence community health and food access through policy development. For example, to increase fresh food access, local government can assist in covering

the initial costs of establishing Electronic Benefit Transfer (EBT) terminals at local farmers markets so that the markets can accept Supplemental Nutrition Assistance Program (SNAP) benefits. Local government can also ease the burden of creating and maintaining community gardens by offering property tax exemptions to established plots or can examine laws that may prohibit residents from engaging in other agricultural pursuits (e.g., keeping chickens or bees) within city limits. With any policy-related decisions aimed at increasing food access and community health, policy makers should be especially judicious and thorough in their research in order to maximize opportunities for success and avoid the potential for unintended consequences.

Support Farmers and Local Food Production

In the context of a developing local food economy, providing farms with support is essential. Supplying local food products to residents in the CONNECT Our Future region will require a diversity of farms (defined by size and production capacity, products grown or raised, farm infrastructure, etc.) to supply a diversity of market outlets with different requirements.

Small farms in the region – from 1 to 49 acres – are emerging in an environment of increasing demand for locally grown food and interest in experiencing local agriculture. Small farms, in particular, are well positioned to be innovative and respond to the demands of the local market. Often relying on direct sales, small farms supply their products to residents and visitors via farmers markets, CSAs, roadside stands, and small businesses. At the same time, the data show that a large proportion of the region’s small farms are losing money. While the emergence of small farms offers a promising countertrend to the loss of larger scale farms in the region, the increase will only be maintained if farms can become and stay successful

¹¹⁷ These terms are further defined in Appendix B: Local Food System Development in Region.

and profitable.

Mid-sized and larger scale farms (50+ acres) have the production capacity to reach larger retail markets like grocery stores and schools. These farms are also important to a developing local food system, because they are able to supply the markets where the majority residents and visitors purchase food. The data, however, show that in the CONNECT Our Future project region the number of farms in these categories are declining.

For all sizes of farms, farmers need a combination of skills, resources, and support to access the opportunities in local markets successfully. Farmers need training and expertise in business and market planning to effectively diversify their farm businesses and to market their farm products locally. Farmers need to understand industry standards for different types of local market outlets: packaging, labeling, food safety requirements, distribution, quality standards, trace-back standards, etc. Furthermore, farmers need assistance determining what types of market outlets are a good match for the capacity of their farm. For retail, wholesale, and institutional outlets in particular, farmers need assistance developing relationships with buyers and information specific to market requirements and desires. This combination of assistance provides farmers with the support needed to make decisions and implement practices based on careful planning. Decisions based in planning reduce risk and increase the likelihood that strategies are successful.

Focus group discussions with area agriculture and food system stakeholders revealed existing programs in the region that currently provide valuable training for new farmers. Examples include the Elma C. Lomax Incubator Farm in Cabarrus County, Slow Food Charlotte's Soil Fertility Workshop, and North Carolina's REAL Entrepreneurship program, which offers agriculture classes through community colleges

in the region. To continue to support farmers and local food production in the project region, one important step will be to collaborate with groups that already have the resources and knowledge needed to help new and beginning farmers, and to find ways to help them expand their capacity and reach more individuals.

Engage Community Members with Local Farms and Food

Citizens who actively participate in and understand local agriculture will become advocates for local food and farms and will provide the foundation for continued development of the region's food system. Rich learning environments focused on local food and experiential instruction will promote healthy eating and positive associations with healthy food, leading to lifelong healthier eating and lifestyle habits. Surveys of the region's local food and farm stakeholders found that community leaders believe outreach and education about local food and local farms is a top priority in the CONNECT Our Future region.

Farm to School, farm tours, farmers markets and CSAs, food and farm festivals, cooking demonstrations, public gardens, and public awareness campaigns are all mediums for bringing farmers and consumers into direct contact, increasing consumer knowledge and awareness of where food comes from, how it is produced, the impacts of the food system on communities and the environment, and the relationship between food and personal health. Accordingly, funding and other kinds of support for regional programs that offer these kinds of activities, resources, and educational materials to community members is essential.

Support Direct Marketing Channels

Direct markets are an important piece of ongoing local food systems activities, which work synergistically with efforts to mainstream local food and expand its distribution into non-direct market outlets. Direct markets can provide the highest return to farmers and the lowest barriers to entry in comparison to other types of markets. They provide an easier starting point for farmers new to marketing because of the minimal cost required for entry. Furthermore, in providing a direct connection between consumer and farmer, they cultivate customer loyalty and advocacy for local farms and food. People shop at farmers markets not just for food, but also for the experience of interacting directly with the people that grow their food and for a sense of community. Direct markets put a face on food and bring heightened visibility to local farms and food, benefitting agriculture as a whole.

In the project region, demand for direct market products is evident from the 2012 Agricultural Census, which shows a 161 percent increase in direct food sales to \$4.7 million in 2012 from \$1.8 million in 2002. Communities within the region can support the maintenance and growth of these markets by promoting existing outlets, assisting with their expansion, or by providing workshops and training for farmers on relevant topics: salesmanship and display, food safety best-practices, food regulation, marketing, and promotion.

Help Consumers Find Local

With increasing public interest in supporting local farms and buying local food, it is vital that consumers know where to find local food across direct, retail, and institutional market settings. Demand for local can only be fulfilled if consumers can find local products and, in non-direct market settings in particular, can identify them in the midst of a crowded market

environment. This can be achieved through guides, advertising, promotions, and labeling. Communities can partner with local media (television, radio, newspapers) and marketing agencies to promote what is being grown in the area and where it is being sold to community members, including existing direct-to-consumer outlets (farmers markets, CSAs, on-farm stores and stands), local grocers, restaurants, etc.

Local and state food branding can be avenues to help customers identify locally grown food, add value to local farm products, and provide farmers with a means to increase their marketing power. Several food branding programs are active in the region. These programs include the North Carolina Department of Agriculture's Goodness Grows/Got To Be NC campaign, the Piedmont Grown local food certification program based in the Piedmont region of North Carolina, and the SEED Foundation's Buy Fresh Buy Local program for North Carolina. The South Carolina Department of Agriculture's Certified South Carolina is a popular program that brings together producers, processors, wholesalers, and retailers to promote South Carolina products and businesses.

Address Key Barriers to Equity and Access

Too frequently food equity and food access are approached with the view that hunger is only a food issue (i.e., that food is too expensive), but hunger is in fact largely a poverty issue. The food system itself, in providing workers with inadequate income, is a significant source of poverty. A key step to addressing the lack of equity in the food system is to shift to solutions based on lifting people out of poverty while continuing to address the immediate needs of people in hunger. Strategies that focus on building local wealth and raising people out of poverty will increase access to healthier foods while decreasing overall inequity in the region.

Every community is unique; this uniqueness means that in each community the opportunities and means to help low-income community members access fresh, local food options will be different. Regardless of the specific conditions of individual communities, community stakeholders in the CONNECT region should investigate methods for increasing the accessibility of local fresh foods by making these foods more available in the places where low-income community members already shop, conducting community outreach about the availability of local food options, increasing awareness of where low-income community members can use their SNAP benefits to purchase local foods, and organizing opportunities to help less mobile residents access the transportation they need to shop for food. While many initiatives exist within the project region to address these issues, they often operate with inadequate resources and need additional support and coordination.

Provide Outreach and Education to Low-Income Communities

Given that food choices are about more than just availability, actions in the greater Charlotte region designed to increase food access must incorporate educational and experiential components. The food system stakeholders surveyed for this assessment recognized this need, naming education and outreach as the second most pressing action needed to advance local food systems development in the region (after promoting and supporting connections between local farms and local food businesses).

Educational and experiential activities around local food provide food system stakeholders in the CONNECT project region with a means to promote equity and access in the food system. The CONNECT Our Future region is already home to several annual

food and farm events (e.g., the Charlotte area's Know Your Farms Tour, the Statesville Pumpkin Fest, the York County Ag + Art Tour) and to active Farm to Institution programs. For food stakeholders in the region, a key action step is to support the existing efforts of organizations coordinating and promoting activities and events which highlight local food and farms, and to help promote these activities to *all* members of the community.

Determine the Local Messages that Resonate with the Public

The successful implementation of a local food campaign strategy in the CONNECT Our Future project region will depend, in part, on the ability to define and promote local in a way that resonates with the public. When it comes to tapping into consumers' demand for local food, authenticity and trustworthiness of local labeling and local branding are key. The fact that there are so many existing branding programs in the CONNECT region speaks to the fact that people in this region have very different ideas about what local means and what counties/areas should be included in a local food effort. It is therefore important to conduct additional research in the region to understand how residents define local, to identify the messages and values that resonate most with them, and to determine the communications channels they use most often. Stakeholders within the CONNECT region should partner with local media to deliver clear and consistent messaging that mirrors the values and benefits that residents associate with buying local food and supporting local farms as revealed in the research findings.

Conduct Research to Assess Food

Infrastructure Capacity

This assessment project has mapped the existence of the intermediary elements in the region's supply chain. Further research needs to be conducted to understand how food is moving around the region, what the capacity and opportunity is for these existing pieces of infrastructure to make room for local food distribution, processing, etc., and where gaps exist that may be barriers to further local food system development.

As the local food system grows, gaps in the infrastructure will need to be addressed. Infrastructure development projects like the building of a meat processing facility or a food hub are significant undertakings complicated by regulatory issues, siting difficulties, and extraordinary capital requirements. A key question to guide research into these types of projects would be: can infrastructure that may be proposed generate enough income to pay for operating costs? If infrastructure projects are unable to pay for operating costs, income streams need to be identified. If subsidized processing, aggregation, and distribution are deemed worthy of continued financial support, critical analysis should be done regarding the impact of such “market distortions” on the long-term viability of local farms and local food.

Consider Food Waste Diversion

Efficient food waste management is an important part of a healthy regional food system and can be responsible for a wide array of benefits including reduced environmental impacts, improved food access, reduced hunger, and large-scale financial savings. In addition, sustainable waste disposal systems can create economic opportunities through

entrepreneurship in fields such as waste collection, composting, and anaerobic digestion, while also producing rich soil amendments and alternative fuel sources.

Improving the food waste management system in the project area will involve a suite of coordinated solutions, including new government policies and incentives, adjustments in supply-chain operation, increased public awareness, and behavioral changes among consumers. While significant improvements will ultimately require a concerted effort involving decision-makers throughout the supply chain, state, county, and local governments are uniquely poised to lead the charge through systematic policies, programs, and incentives. County governments in the project area could significantly improve the efficiency of food waste disposal in the region by setting food waste targets and implementing food waste prevention campaigns in their jurisdictions, by adopting policies that incentivize donation of edible food and composting of non-edible food waste, and by providing direction and infrastructure to enable residential and commercial food waste diversion programs. Taking steps now to improve and streamline the food waste management system within the CONNECT Our Future project region could have far-reaching and beneficial impacts on the food system for many years to come.

Develop an Intentional Network to Foster Communication and Collaboration

One of the key findings of this assessment, of stakeholder surveys, and of focus groups is that residents of the CONNECT Our Future project region do not tend to think of “their region” or “local” using the 14-county parameter created for this project. Instead, residents and stakeholders identify their regions according to a variety of natural and political

boundaries. In order to create buy-in and acceptance of the CONNECT Our Future food systems plan, it is critical to collaborate with leaders of the smaller communities within the CONNECT region from the very beginning. Various community stakeholders (e.g., farmers, food entrepreneurs, food industry buyers, decision-makers, agriculture specialists, health and human services representatives) should be engaged in formative planning processes. Some of this work is already being done as the CONNECT Our Future project works to develop food policy councils in each of the 14 counties. Developing these groups of diverse stakeholders will promote project buy-in and simultaneously identify sources of local knowledge, capacity, and resources.

It will be up to the CONNECT Our Future project leaders to show these stakeholders the importance of collaboration and the value that participating in the project will bring to the region as a whole. Strong demand for increased local food capacity exists; it is important to empower stakeholders with the means to increase their own abilities to work effectively and to access residents' desire to support local farms and the local economy.

As the overall CONNECT Our Future project anticipates the need for community level decision-making and collaboration as well as building on emerging and existing efforts, these recommendations are intended as general guidelines for local decision-making.

Tables

Table 1. Diet-Related Illness in the CONNECT Our Future Project Region

	Rate of diagnosed diabetes¹¹⁸	Rate of obesity¹¹⁹	Rate of high cholesterol^{120,121}
Anson	12.3%	35.5%	n/a ¹²²
Cabarrus	9.4%	30.7%	33.9%
Cleveland	11.6%	32.5%	n/a
Gaston	9.0%	26.2%	46.0%
Iredell	8.1%	28.2%	42.7%
Lincoln	10.0%	27.2%	n/a
Mecklenburg	8.5%	25.6%	32.8%
Rowan	10.8%	31.6%	45.8%
Stanly	9.6%	26.6%	n/a
Union (NC)	8.3%	27.9%	35.8%
Chester	11.3%	31.8%	39.9%
Lancaster	11.0%	32.5%	39.9%
Union (SC)	11.9%	35.8%	43.2%
York	9.0%	29.4%	39.9%
CONNECT Project Region	9.7%	27.7%	n/a

¹¹⁸ “Centers for Disease Control and Prevention: National Diabetes Surveillance System,” Centers for Disease Control and Prevention, accessed October 8, 2013, http://apps.nccd.cdc.gov/DDT_STRS2/CountyPrevalenceData.aspx?mode=OBS.

¹¹⁹ Ibid.

¹²⁰ “2011 BRFSS Survey Results: North Carolina Counties and AHEC Regions Cholesterol Awareness,” North Carolina State Center for Health Statistics, accessed October 8, 2013, <http://www.schs.state.nc.us/SCHS/brfss/2011/nc/nccr/toldhi2.html>.

¹²¹ “County-Specific Epidemiology Reports: Coordinated Chronic Disease County Fact Sheet,” South Carolina Department of Health and Environmental Control, accessed October 8, 2013, <http://www.scdhec.gov/health/epidata/county.htm>.

¹²² Data for counties listing “n/a” was unavailable.

Table 2. Farms and Acres of Farmland, 2002, 2007, and 2012

	2002	2007	2012	% Change 02-12
Farms	10,076	10,097	9,721	-4%
Land in farms (acres)	1,324,703	1,273,029	1,279,507	-3%
Average size of farm (acres)	132	126	132	0%
Size of farm (acres)	2002	2007	2012	% Change 02-12
1 to 9 acres	624	734	745	+19%
10 to 49 acres	3,807	4,129	3,994	+5%
50 to 179 acres	3,887	3,619	3,464	-11%
180 to 499 acres	1,296	1,188	1,054	-19%
500 to 999 acres	287	250	279	-3%
1,000 acres or more	175	177	185	+6%

Table 3. Farms by Value of Sales, 2002, 2007, and 2012

Value of Gross Sales	Number of Farms 2002	Number of Farms 2007	Number of Farms 2012
Less than \$2,500	5,031 (50 percent)	4,892 (48 percent)	4,081 (42 percent)
\$2,500 to \$4,999	1,272 (13 percent)	1,221 (12 percent)	1,273 (13 percent)
\$5,000 to \$9,999	1,123 (11 percent)	1,165 (12 percent)	1,169 (12 percent)
\$10,000 to \$24,999	1,035 (10 percent)	1,123 (11 percent)	1,149 (12 percent)
\$25,000 to \$49,999	352 (3 percent)	469 (5 percent)	494 (5 percent)
\$50,000 to \$99,999	212 (2 percent)	210 (2 percent)	310 (3 percent)
\$100,000 or more	1,051 (10 percent)	1,017 (10 percent)	1,114 (11 percent)

Table 4. Dollar Share of Retail Produce Sales for Selected Produce, 2012

	% of Total Produce Sales		% of Total Produce Sales
Apples	7.0%	Nuts (all)	0.4%
Bell peppers	2.6%	Peaches	1.2%
Blackberries	0.7%	Potatoes	6.0%
Blueberries	2.4%	Pumpkins	0.2%
Cantaloupe	1.5%	Snap beans	0.8%
Collards	0.3%	Squash	1.4%
Cucumbers	1.8%	Strawberries	4.9%
Grapes	6.1%	Sweet corn	1.2%
Lettuce	2.2%	Tomatoes	7.4%
Lima beans	n/a		

Table 5. Production of Selected Fresh Fruits and Vegetables, 2012

	Acres in Production ¹²³	Sufficient to Supply (x)% of the Local Population ^{124,125}
Apples	27	1.5%
Bell Peppers	7	0.3%
Blackberries	6	24.7%
Blueberries	75	17.5%
Cantaloupe	9	0.4%
Collards	8	5.4%
Cucumbers	7	0.6%
Grapes	125	5.2%
Lettuce	3	0.1%
Lima beans	2	5.5%
Nuts	190	7.9%
Peaches	343	85.4%
Potatoes	79	1.4%
Pumpkins	89	16.4%
Snap beans	14	1.3%
Squash	7	1.9%
Strawberries	63	4.5%
Sweet Corn	18	0.5%
Tomatoes	20	0.9%

¹²³ Cynthia Clark, ed., "2012 Census of Agriculture," National Agricultural Statistics Service United States Department of Agriculture (2014).

¹²⁴ "Crops Highs & Lows Stocks & Storage: Biotech Varieties Floriculture County Estimates," North Carolina Department of Agriculture (2010), http://www.ncagr.gov/stats/2010AgStat/Page057_082.pdf.

¹²⁵ Jeanine Bentley and Jean C. Buzby, "ERS Food Availability (Per Capita) Data System (FADS)," (2013), [http://www.ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system.aspx#.UnkVy_IPIOE](http://www.ers.usda.gov/data-products/food-availability-(per-capita)-data-system.aspx#.UnkVy_IPIOE).

Table 6. Production of Selected Animal Products, 2012

	Number of Animals ¹²⁶	Sufficient to Supply (x)% of the Local Population ^{127,128}
Beef cows	25,140	40%
Chickens	141,853,386	399%
Hogs	135,196	23%
Turkeys	7,375,155	547%
Fluid cow's milk	20,081	74%

Table 7. Entities Mapped on Local Food Infrastructure Inventory Map, 2013

Infrastructure Category	# of Entities
Fruit & Vegetable Wholesale/Distributors	30
Fruit & Vegetable Processing	22
Meat Processing	
Total	67
Niche Meat Producers (Works Directly with Farmers)*	7
Seafood Processing or Wholesale/Distribution	10
Dairy Processing/Cheeses	26
Cold Storage	13
Multi-farm CSA	2
Commercial Kitchen	1
Incubator Farm	1
Food Hub	1
Farmers Markets (in process of adding icon to map)	59

¹²⁶ Cynthia Clark, ed., "2012 Census of Agriculture"; "Data Food Availability (Per Capita) Data System: Food Guide Pyramid" Economic Research Service (2014), http://www.ncagr.gov/stats/2010AgStat/Page057_082.pdf.

¹²⁷ "Crops Highs & Lows Stocks & Storage: Biotech Varieties Floriculture County Estimates," North Carolina Department of Agriculture (2010), http://www.ncagr.gov/stats/2010AgStat/Page057_082.pdf.

¹²⁸ Jeanine Bentley and Jean C. Buzby, "ERS Food Availability (Per Capita) Data System (FADS)."

Table 8. Selected Pantries, Food Banks, and Community Gardens in the Region by County

County	Pantries, Food Banks, and Community Gardens
Anson	Angels & Sparrows Soup Kitchen Anson Crisis Ministry Feed My Lambs
Cabarrus	Operation Bread Basket Low2Max Yield Community Garden at the Lomax Farm
Cleveland	Walls Memorial Baptist Church Food Pantry Solid Rock Garden
Gaston	B.R.E.A.D. Ministries, Inc. Gaston County Historic Community Garden
Iredell	Mooresville Soup Kitchen
Lincoln	Soup Kitchen, Christian Ministry of Lincoln County Lincoln County Community Garden
Mecklenburg	Friendship Trays Loaves and Fishes Friendship Gardens SEEDS Community Garden at St. Alban's Episcopal Church
Rowan	Rowan Helping Ministries St. Luke's Community Garden
Stanly	Stanly Community Christian Ministry Healthy Harvest Teaching Garden
Union, NC	Loaves and Fishes of Union County, Inc.
Chester	Harvest Hope Food Bank
Lancaster	HOPE in Lancaster, Inc. Lancaster County Community Garden
Union, SC	Second Harvest Food Bank of Metrolina
York	PATH People Attempting To Help

Table 9. Estimated Resident Consumption and Spending, and Estimated Farm Production of Selected Fresh Fruits and Vegetables in the Project Region (2012 and 2013 data)

	Pounds consumed by residents per year	Estimated retail value of resident consumption	Estimated retail value of current farm production	<i>Estimated spending minus estimated value of production</i>
Apples	39.4M	\$58.6M	\$5.2M	\$53.4M
Bell Peppers	25.2M	\$50.1M	\$0.3M	\$50.2M
Blackberries	0.2M	\$1.2M	\$3.1M	\$(-1.9M)
Blueberries	2.5M	\$11.6M	\$0.8M	\$10.8M
Cantaloupe	21.8M	\$13.1M	\$1.1M	\$11.9M
Collards	1.6M	\$2.9M	\$0.3M	\$2.6M
Cucumbers	17.2M	\$27.6M	\$1.9M	\$25.7M
Grapes	20.8M	\$40.4M	\$1.5M	\$38.9M
Lettuce	68.4M	\$95.1M	\$0.1M	\$95.0M
Lima beans	0.05M	\$0.01M	\$8,000	\$0.9M
Nuts	10.2M	\$51.8M	\$2.7M	\$49.1M
Peaches	12.0M	\$18.4M	\$15.6M	\$2.9M
Potatoes	90.7M	\$61.7M	\$0.4M	\$61.3M
Pumpkins	11.4M	\$10.8M	\$2.3M	\$8.5M
Snap beans	4.8M	\$9.3M	\$0.2M	\$9.1M
Squash	11.0M	\$15.9M	\$20.3M	\$(-4.4M)
Strawberries	18.5M	\$45.0M	\$3.1M	\$41.6M
Sweet Corn	21.8M	\$22.4M	\$2.0M	\$20.4M
Tomatoes	53.2M	\$119.8M	\$35.9M	\$83.9M

Figures

Figure 1. CONNECT Our Future Project Region



Figure 2. Farms by Value of Sales, 2002, 2007, and 2012

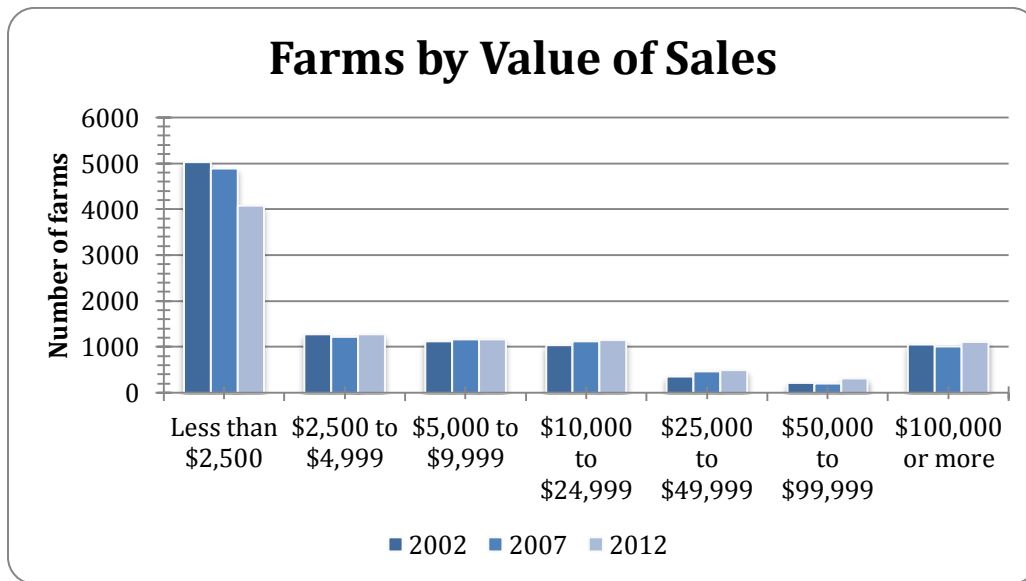


Figure 3. Farms by North American Industry Classification System, 2012

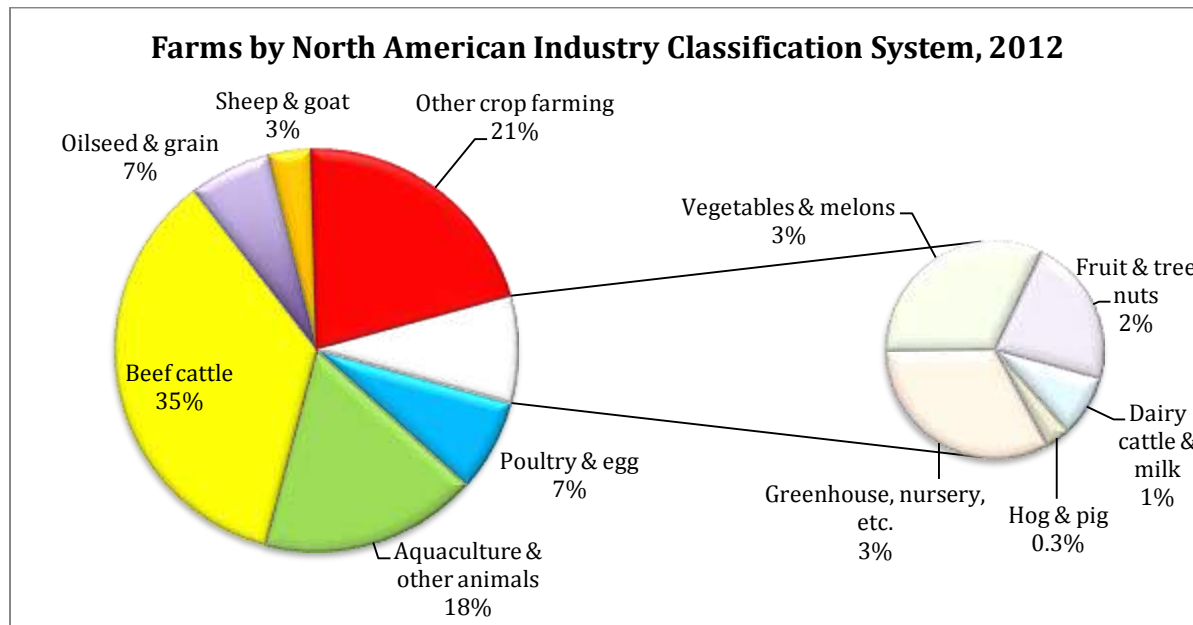


Figure 4. Net Cash Farm Income: Average Net Earnings and Losses, 2007 and 2012

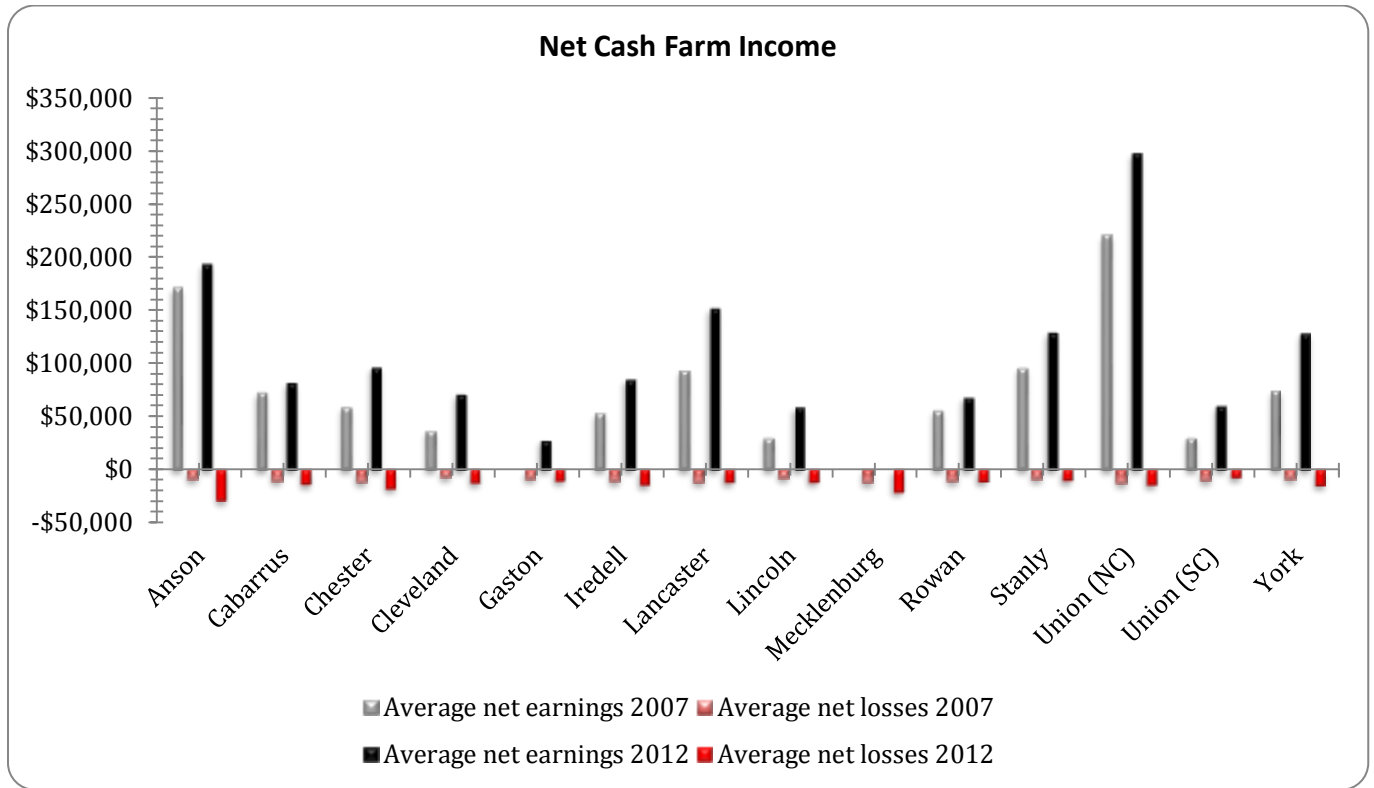


Figure 5. Net Cash Farm Income: Farms Reporting Net Gains and Net Losses, 2007 and 2012

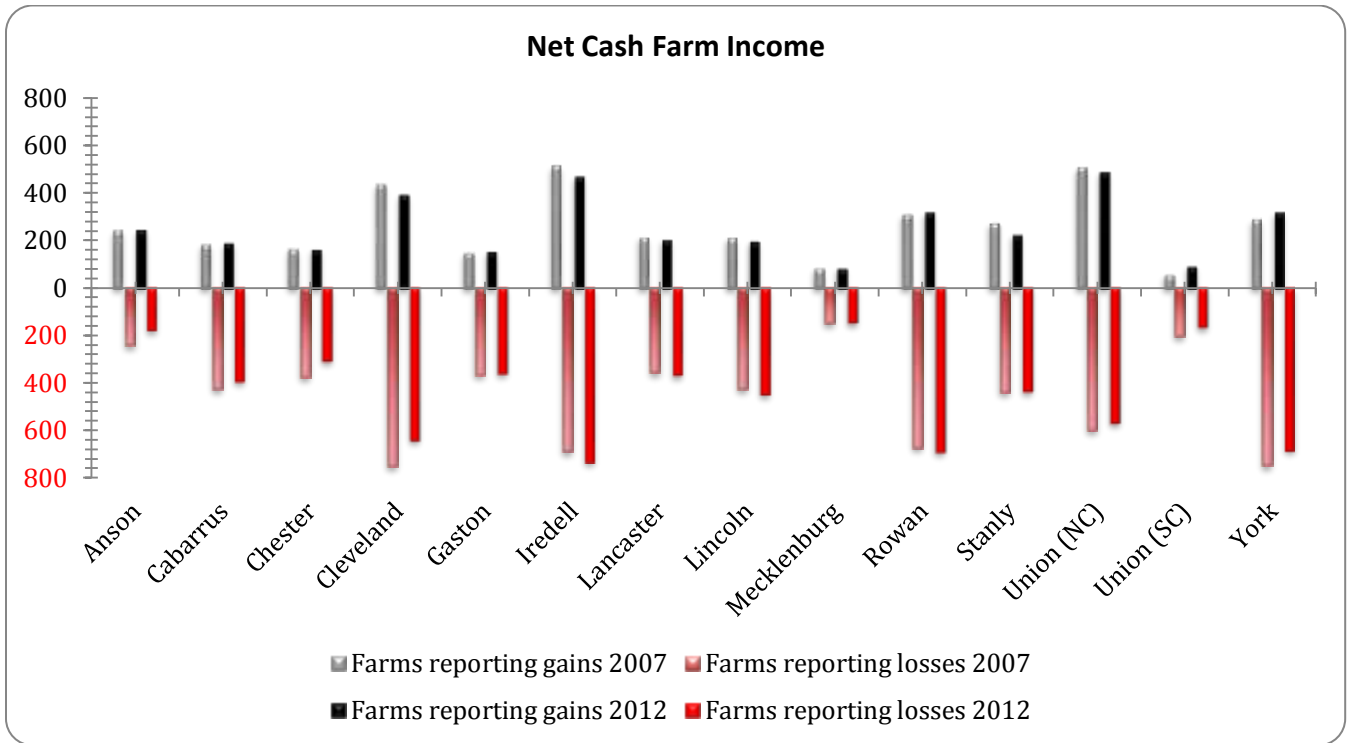


Figure 6. Local Food Infrastructure Inventory Map for Project Region, 2013

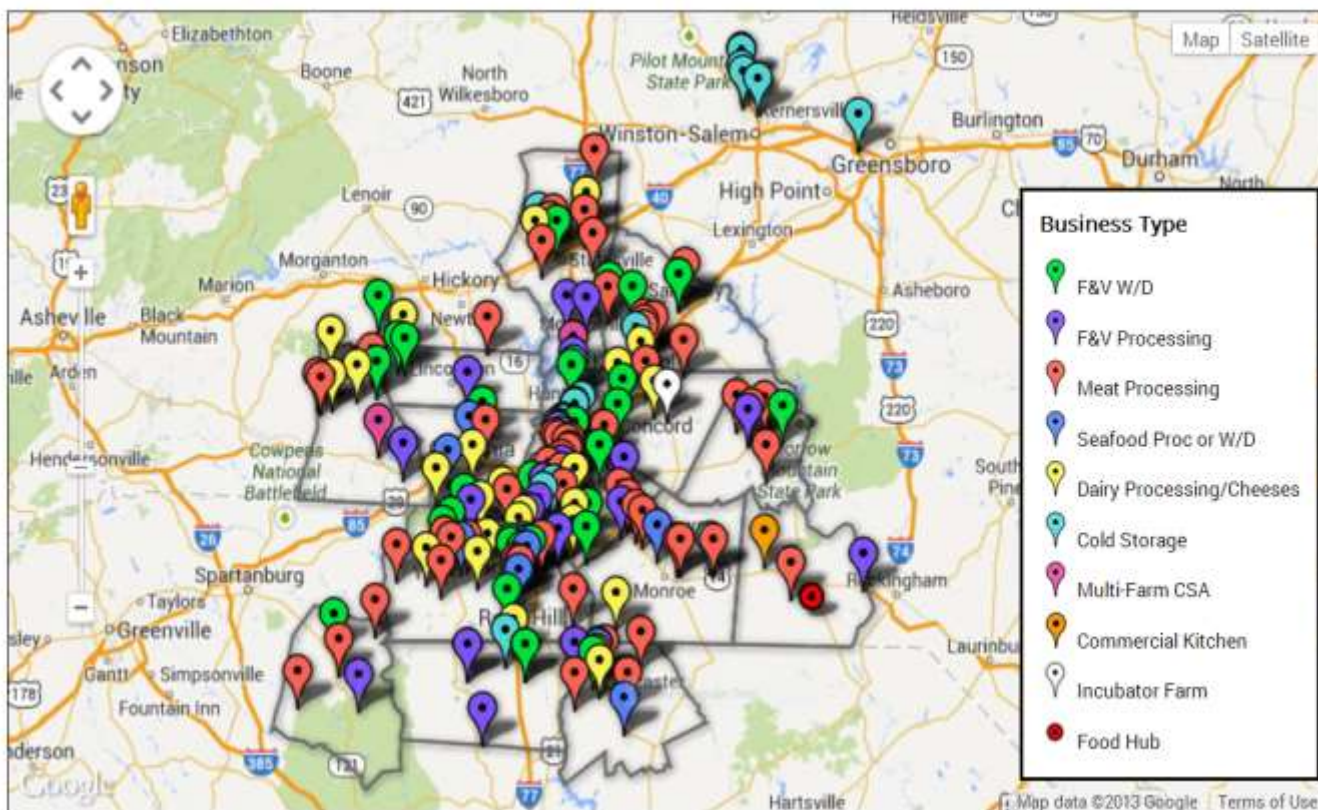
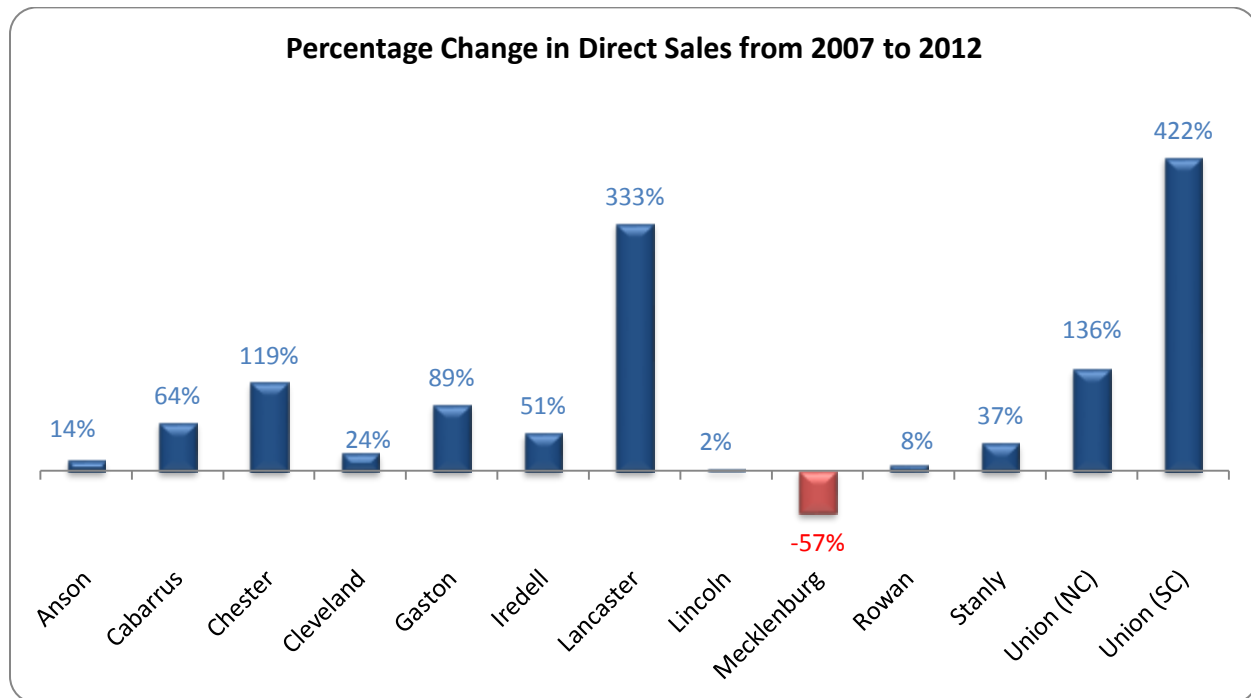


Figure 7. Food Deserts within the Project Region, 2013



Figure 8. Percentage Change in Direct Sales from 2007 to 2012¹²⁹

¹²⁹ 2007 and 2012 Census of Agriculture data.

CONNECT Our Future
Vibrant Communities – Robust Region

