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# Mapping Access to Fresh Produce, Fish and Shellfish at a Local Level Using a Mixed - Method Community Food Assessment Approach: A Case Study - St. Helena Island, South Carolina

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**Mapping Access to Fresh Produce, Fish and Shellfish at a Local Level  
Using a Mixed - Method Community Food Assessment Approach**

**A Case Study - St. Helena Island, South Carolina**

By Pedro-Miguel Soto

Submitted in Partial Fulfillment of the Requirements  
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at

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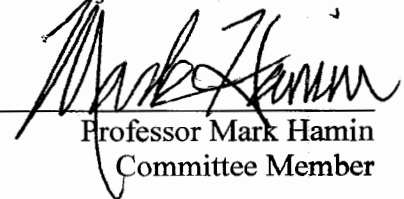


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## ***Abstract***

*This report is a summary of a community food assessment (CFA) conducted over the course of five field survey trips to St. Helena Island, South Carolina, from December 2011 to July 2013. The goal of this CFA was to understand community characteristics related to the distribution and consumption of fresh produce, fish and shellfish. The method used for this CFA is composed of three parts, (1) spatial analysis using Geographic Information System (GIS) data (2) a community food assessment survey focused on where residents obtain their food and (3) ethnographic interviews with local growers, subsistence farmers and consumers. Applying this mixed-method approach, we uncovered an intricate informal network of subsistence farmers who supply the local food system with fresh produce, shellfish and fish products. Initial fieldwork findings indicate that during harvest, fresh produce, fish and shellfish are regularly dispersed, free of charge, throughout the community by familial and neighbor-to-neighbor sharing relationships. Additional food is shared for low or no cost via "informal access points" such as front-yard produce stands, county food pantries, and distribution at local places of worship. Of those surveyed on the island, (N=50) 75 percent report having either direct or indirect access to fresh produce, fish and shellfish through this informal network. These preliminary findings suggest that rural communities with limited transportation access to supermarkets may actually have substantially more access to fresh fruits, vegetables and other culturally significant foods than previously determined by conventional quantitative 'formal' food desert detection methodologies.*

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## 1. Introduction

For decades, community activists have organized around the lack of access to healthy foods as an economic, health and social justice issue. As concerns grow over healthcare and the United States' worsening obesity epidemic, 'food deserts' — which are loosely defined as areas where there is little or no access to healthy and affordable food — have moved to the forefront of public policy discussions (Flournoy and Treuhaft, 2010). It is not surprising then that in recent years, research related to food systems and the lack of access to healthy food has begun to appear in the planning literature with more frequency, reflecting a growing community concern with the relationship among place, food and social well-being (Morgan, 2009).

Academics, planning practitioners and public health researchers have responded to the food access debate by investigating a wide spectrum of issues related to food systems and access. For example, "many researchers have looked directly at the correspondence between various aspects of the food environment (regional sprawl and the presence or absence of supermarkets, convenience stores, and fast-food restaurants) and a variety of health indicators" (Lette et al., 2012; see also e.g., Lathey, Guhathakurta, and Aggarwal 2009; Raja et al. 2010). While research related to the detection of food deserts have varied widely in approach and methodology, a review of the literature reveals that all studies employ at least one of the following type of indicators to measure access: (a) *accessibility (proximity) to sources of food*, (b) *neighborhood-level indicators of resources* and (c) *individual-level resources* (Ver Ploeg et al., 2009). The following section is a brief overview of these three types of measures and examples of how each have been used.

## **A. Three Types of Food Desert Access Measures**

### **i. Accessibility (Proximity) to Sources of Food**

The most widely used access measure in food desert research is accessibility to sources of healthy food, as measured by distance to a store or by the number of stores in an area (e.g. Apparicio, Cloutier and Shearmur, 2007; Guy and David, 2004; Kaufman, 1999; Leete, Bania and Sparks, 2012; Morton and Blanchard, 2007; Short, Guthman and Raskin, 2007; Smoyer-Tomic, Spence and Amrhein, 2006; Wrigley et al., 2002; Wrigley, Warm, and Margetts, 2003; Wrigley, 2002; Clarke, Eyre, and Guy, 2002; Whelan et al., 2002; Wrigley, Guy, and Lowe, 2002). These studies use proximity from a population to sources of food retailers to calculate the level of access in a given geographic area. This concept is best illustrated in the study, "*The Case of Montréal's Missing Food Deserts: Evaluation of Accessibility to Food Supermarkets.*" In this study, authors Apparicio, Cloutier and Shearmur (2007) use *proximity*, defined as the distance between the weighted centroid of census tracts identified as "socially deprived" to the nearest supermarkets to determine the level of access within a given tract. This method employs an ArcGis hierarchical cluster analysis to identify the areas with food deserts.

### **ii. Neighborhood-level indicators of resources**

The second most widely used access measure found in the literature is neighborhood-level indicators of resources, such as the average income of the neighborhood and the availability of public transportation (e.g. Donkin et al, 1999; Flournoy and Treuhaft, 2010; Hamm and Bellows, 2003; Mader, Erin and Busse, 2011; Pothukuchi, 2004; Powell, Slater, Mirtcheva, Bao and Chaloupka, 2007; Raja, Yin, Roemmich, Ma and Epstein, 2010). As outlined by McEntee and Agyeman (2009) neighborhood-level indicators of resources, "involves the examination of not only poverty, but other financial elements that impact one's ability to acquire food, such as

unaffordable food prices and high transportation costs.” (p. 4).

### **iii. Individual-level resources that may affect accessibility**

Individual-level resources that may affect accessibility refers to measure indicators such as family income or vehicle availability (e.g. Flannery, Ezekiel, and Mincyte 2010; Lathey, Guhathakurta and Aggarwal, 2009; Robinson and Tanya, 2008; Raja, Ma and Yadav. 2008; Smith, Morton, 2009). Having access to a vehicle is considered an important factor in gaining access to healthy foods because most people drive to a supermarket, especially in rural communities where supermarkets are spatially further apart.

While there has been much progress in the development of these three types of access measures to detect food deserts, two unresolved methodological issues remain. First, there has been no assessment of the comparability of these methods (Leete et al., 2012). As Smoyer-Tomic, Spence, and Amrhein (2006) note,

Comparison across existing studies of different metropolitan areas is therefore difficult; thus, broader generalizations about patterns of access across cities have been infrequent. Each study is left to stand on its own, hampering the development of generalizable ideas about differential causes and consequences of, or policy remedies for, food deserts (Smoyer-Tomic, Spence, and Amrhein 2006).

Second, the vast majority of food desert identification methods (Guy and David 2004; Smoyer-Tomic, Spence, and Amrhein 2006; Apparicio, Cloutier, and Shearmur 2007; Larsen and Gilliland 2008) have been developed specifically for application in densely populated, urban areas. As a result, methods derived from these studies cannot be directly applied in rural communities employing the same methodology.

Only four studies (Kaufman 1999, Morton and Blanchard 2007, Sharkey and Horel 2008, McEntee & Agyman, 2010) have developed methodologies to assist in the detection of food deserts in rural areas of the United States. McEntee and Agyman (2010) note that, “although the

frequency of general rural food access studies is increasing (e.g., Burns & Inglis, 2007; Furey et al., 2001, Liese, Weis, Pluto, Smith, & Lawson, 2007, Morton & Blanchard, 2007, Olson et al., 1996, Skerratt, 1999), efforts to measure accessibility to food resources in “rural contexts have largely been ignored”. Consequently, “little is known about the spatial inequalities and potential access to the food environment in rural areas” (Apparicio et al., 2007) .

In this study, we develop an alternative, mixed-method approach to measuring and mapping access to healthful, affordable and culturally appropriate foods in rural communities. Utilizing St. Helena, South Carolina (a previously identified area with limited transportation access to food) as a case study, we offer evidence that suggests that economically disadvantaged rural communities with limited access to transportation may have substantially more access to good-quality food than once thought. We make the argument that a more robust approach in the detecting of rural food deserts would be to first conduct higher level macro-analysis to detect general areas where a food deserts may exist and then, ground-truth smaller geographic areas such as neighborhood with the aid of a Community Food Assessment (CFA). Community Food Assessments are activities to systematically collect information on issues related to community food systems, so that community leaders and agencies may devise appropriate strategies to improve food security in their localities (Pothukuchi, 2004).

### **B. A Review of the Development of Food Desert Analysis**

The 2008 Farm Bill passed by the U.S. Congress described a food desert as an “area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower-income neighborhoods and communities” (Title VI, Sec. 7527). The food desert metaphor has been used rather loosely (Short, Guthman, and Raskin 2007). This concept was first introduced by Wrigley (2002) to describe “British cities with poor



access to retail provision of healthy, affordable food” (Whelan et al, 2002).

The first papers to research the food desert phenomenon originated in the United Kingdom. Leete et al., (2007) notes that these studies “further refined the questions and research methodologies for defining ‘food deserts’ – described then as “low income, urban areas with diminished walking distance access to grocery stores” (e.g. Wrigley et al., 2002; Wrigley, Warm, and Margetts, 2003; Wrigley, 2002; Clarke, Eyre, and Guy, 2002; Whelan et al., 2002; Wrigley, Guy, and Lowe, 2002). “Most recently, a number of studies have asked similar questions for Canadian cities” Leete et al. (2007) (e.g. Smoyer-Tomic, et al. 2006, Appricio et al, 2007, among others). A range of patterns have emerged, from findings of pronounced food deserts in some locales (e.g. London, Ontario) to findings of a relatively even distribution of grocery store access in others (Montreal, Quebec and Edmonton, Alberta) (Leete et al, 2007). One of the issues in the study of food access is identifying a standardized definition of the term. Leete et al., (2012) cites the lack of a common definition for food deserts as one of the problems associated with a thorough understanding in this area of research. Again, Leete et al. (2012) notes “[Because of a] lack of a common definition of food deserts...there is no basis for knowing whether results across studies are comparable.” Furthermore, Leete et al., (2007) outlines that most studies dedicated to the detection of food deserts have primarily employed distance-based measures (or Accessibility to Sources as mentioned earlier), computing variously the average distance from a given neighborhood to one or more stores and/or identifying neighborhoods in which a set share of the residents do or do not live within what would be considered a reasonable walking distance to a store (Guy and David 2004; Smoyer-Tomic, Spence, and Amrhein 2006; Apparicio, Cloutier and Shearmur 2007; Larsen and Gilliland 2008, Leete et al., 2011).

Undoubtedly, these studies and many others like them have deepened our understanding

of the issues that directly and indirectly affect access in urban areas and rural areas. However, given the low population density, longer distances between retailers, and rapid rise of supercenters and their impact on other food retailers, the major determinants for access to food in rural areas are different than those in urban areas (Ver Ploeg et al. 2009). As a result, methods would need to be developed that are sensitive to these differences and go beyond measures that only measure proximity.

### **C. Food and Health Related Issues in Rural Communities of the United States**

Issues of food access are especially acute in rural communities (Sharkey et al., 2012). Controlling for population, rural communities have significantly fewer food stores of all types, with the greatest lack of availability for chain supermarkets; rural communities have just 14% of the number of chain supermarkets available compared with urban zip codes (Smith et al., 2009). Morton and Blanchard (2007) report that higher retail prices for fresh produce, a limited variety of foods stocked in stores and longer distances to food retailers can add to the challenge of accessing and establishing healthy eating habits in rural communities. More general research has found that 98% of counties categorized as food deserts are located in non-metropolitan areas, most in towns or cities of fewer than 10,000 people (Morton & Blanchard, 2007). Surprisingly, some of America's poorest regions are rural communities surrounded by fertile farmland that once sustained vibrant agrarian communities and food traditions. Obesity rates are higher in these rural areas. Rural farm families who have historically grown their own food or purchased staples from local grocery stores now increasingly rely on alternative food sources, including fast-food outlets, liquors stores, and gas stations (Powell et al., 2007). Given these shortcomings, the development of appropriate methods and research approaches is an important endeavor.

#### **D. Methodologies to Measure Access in Rural Communities**

In the past decade, four studies have investigated systematic methodologies for the detection of food deserts in rural communities (Kaufman 1999, Morton and Blanchard 2007, Sharkey and Horel 2008, and McEntee & Agyman, 2009). As mentioned previously, food access studies employ at least one of the following indicators of access (a) *accessibility to sources of food*, (b) *neighborhoods level of indicators of resources* and (c) *individual level resources* (Ver Ploeg et al., 2009). All of the studies mentioned in the following section employ indicators to measure the accessibility (proximity) to food sources, in particular the average distance between a given population and wholesale and retail food establishments (mainly, supermarkets and large grocery stores).

##### ***Kaufman (1999)***

The Kaufman study (1999) titled, “*Rural Poor Have Less Access to Supermarkets, Large Grocery Stores*” was based in the lower Mississippi Delta. The study examined the role of small grocers and corner stores in providing retail access points for individuals and families living in rural areas of the United States. “Poor households in rural areas rely more on smaller grocery stores and supermarkets than do metro area households, and they may face higher average food prices and reduced access to food as a result” (Kaufman, 1999).

Using a “net accessibility ratio” (a ratio of available large grocery store sales to potential food spending by households in a ZIP code-based area), access was found to be lower for a greater percentage of low-income households compared with all households in the Lower Mississippi Delta (Kaufman, 1999). The study concluded that over 70 percent of the low-income population of the Lower Mississippi Delta eligible to receive food stamp benefits needed to travel more than 30 miles to reach a large grocery store or supermarket.

***Morton and Blanchard (2007)***

In their study, “*Starved for Access: Life in Rural America’s Food Deserts*,” the authors identify counties across the United States “In which at least one-half of the population lives more than 10 miles from the largest supermarkets” (pg. 2). This analysis was also performed in ArcGIS and “identified populations that reside within a 10 miles from supermarkets and supercenters” (pg. 5). The authors describe the method further,

“We (then) selected zip codes that contained at least one supermarket with 50 or more employees or supercenter/wholesale club in 1999. We matched zip code data from ZBP to the 1999 U.S. Bureau of the Census Zip Code File to obtain longitude and latitude coordinates. We selected all census block groups whose boundaries intersect a 10-mile radius of the zip codes that contained supermarkets or supercenters. Block groups falling outside the 10-mile radius were classified as low food access areas. After obtaining the population housed in low food access areas for each county, we divided by the county’s total population to obtain the percentage of the population residing in a low food access area” (Morton and Blanchard, 2007).

***Sharkey and Horel (2008)***

The Sharkey and Horel (2008) study, titled “Neighborhood Socioeconomic Deprivation and Minority Composition are Associated with Better Potential Spatial Access to the Ground-Truthed Food Environment in a Large Rural Area,” represents the most detailed analysis of a geographic access study. The authors of this study “calculated the distance between a population-weighted centroid of a census block group to food retailers in Texas” (Sharkey and Horel, 2008). Unlike the Morton and Blanchard (2007) and the Kaufman (1999) study, the Sharkey and Horel (2008) study verifies the systematic quantitative information that was tabulated by conducting interviews and surveys in the field.

***McEntee and Agyman, (2009)***

One of the most recent studies dedicated to the detection of rural food deserts is titled “*Towards*

*the development of a GIS method for identifying rural food deserts: Geographic access in Vermont, USA,*” McEntee & Agyman, (2009). Much like the Sharkey and Horel report, (2008), this study geocoded the location of food retailers such as supermarkets and other grocery stores that are over 2,500 square feet or more in floor area. The authors’ justification for only including food retailers 2,500 square feet or larger in size was to filter out small convenience stores and gas stations, which typically sell low nutritional value food items at higher prices along with non-consumables (Donkin et al., 2000; Morton and Blanchard 2007; Pothukuchi, 2005). The authors then plotted all the residential units in ( $n=231,894$ ) in Vermont. “To calculate these distances, the authors then used a network measurement tool (specifically, Network Analyst Extension Closest Facility feature of ArcMap 9.1), to measure the distance between every residence and the closest food retailer” (McEntee and Agyman, 2009). One of the most interesting features of this analysis is that the authors decided not to calculate the distance between residential units and supermarkets “as the crow flies,” which is how proximity is usually calculated in GIS. Instead, the authors calculated distances on the road networks, as one would actually travel. This could be considered a strength and a distinction from other proximity based studies, because the distances are more accurate.

Resultantly, each residence had a corresponding closest distance data value, which indicated the distance to the closest retailer. These data were aggregated by census tract and divided by the number of residential units to produce the mean travel distance by census tract. The sums of distances between residential units and retailers were then divided by the number of residential units which would equal the mean distance to food retailer within a given census tract (McEntee and Agyman, 2009).

The study found seven census tracts in Vermont that would be considered to have low access to food retailers, and a mean traveling distance of more than 10 miles.

While these studies represent an important need to identify areas with low access, they do not represent the most accurate depiction of true conditions on the ground. Lopez-Class, Hosler (2010) note, “there were some limitations with GIS in depicting certain spatial information. GIS may not show topographic features such as steep hills, surface conditions of streets, and volume and speed of traffic. Therefore, proximity to a store may not always mean access to the store for pedestrians” (379). Additionally, McEntee and Agyman, (2009) note that the “analysis does not identify a residential unit that houses someone who is poor, lacks cooking skills, and is within ten miles of a food retailer” as part of a food desert (9). The authors of this study note, “fieldwork needs to be conducted to compare people’s experiences with our findings, this could take the form of a price survey, interviews, and/or surveys that explore consumer satisfaction with their food choices” (9).

## 2. Study Area – St. Helena Island, South Carolina

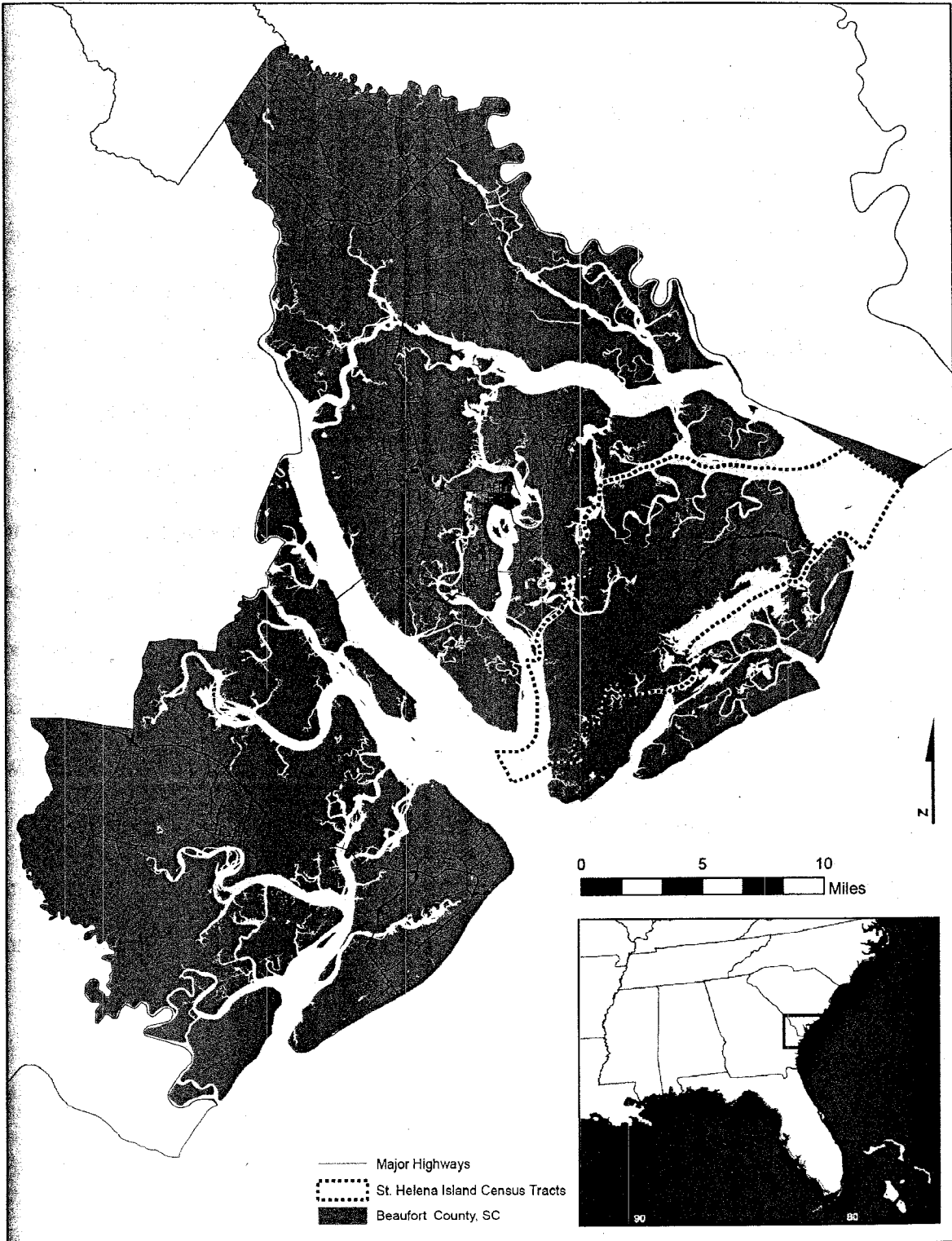


Figure 1: A map of the location of the study area covering two census tracts on St. Helena Island, South Carolina. The inset shows the location of the island, in Beaufort County, in the context of the southeastern United States.

### **A. Population Demographics**

Located in the northeastern portion of Beaufort County, St. Helena Island is surrounded by Colleton County to the north, Lady's Island to the west and the barrier islands of Harbor and Fripp to the east. The residents living in this area belong to a cultural group often referred to as the "Gullah" or "Geechee". Descendants from the extensive slave populations that were brought to South Carolina from Africa and the Caribbean (Littlefield 1991; Pollitzer 1998; Pollitzer 1999), the Gullah communities have dominated the Sea Islands for more than three centuries, from the pre-Revolutionary War era to the present (Pollitzer, 1999).

The study area consists of two census tracts (001101 and 001102) on St. Helena Island, and three block groups (0130011021, 0130011022 and 0130011023). In 2010, the U.S. Census reported that these block groups encompassed an area of 64 square miles and had 9,481 residents, 15% of whom lived below the federal poverty level. Of the total residents, 54.8 percent identified as African American, the greatest concentration of which lived south of Route 21, which bisects the island.

According to the USDA Food Access Research Atlas (a federally-funded food desert locator) has found that St. Helena is considered to have low vehicle access, hampering the ability of residents to gain access to conventional food access points such as supermarkets.



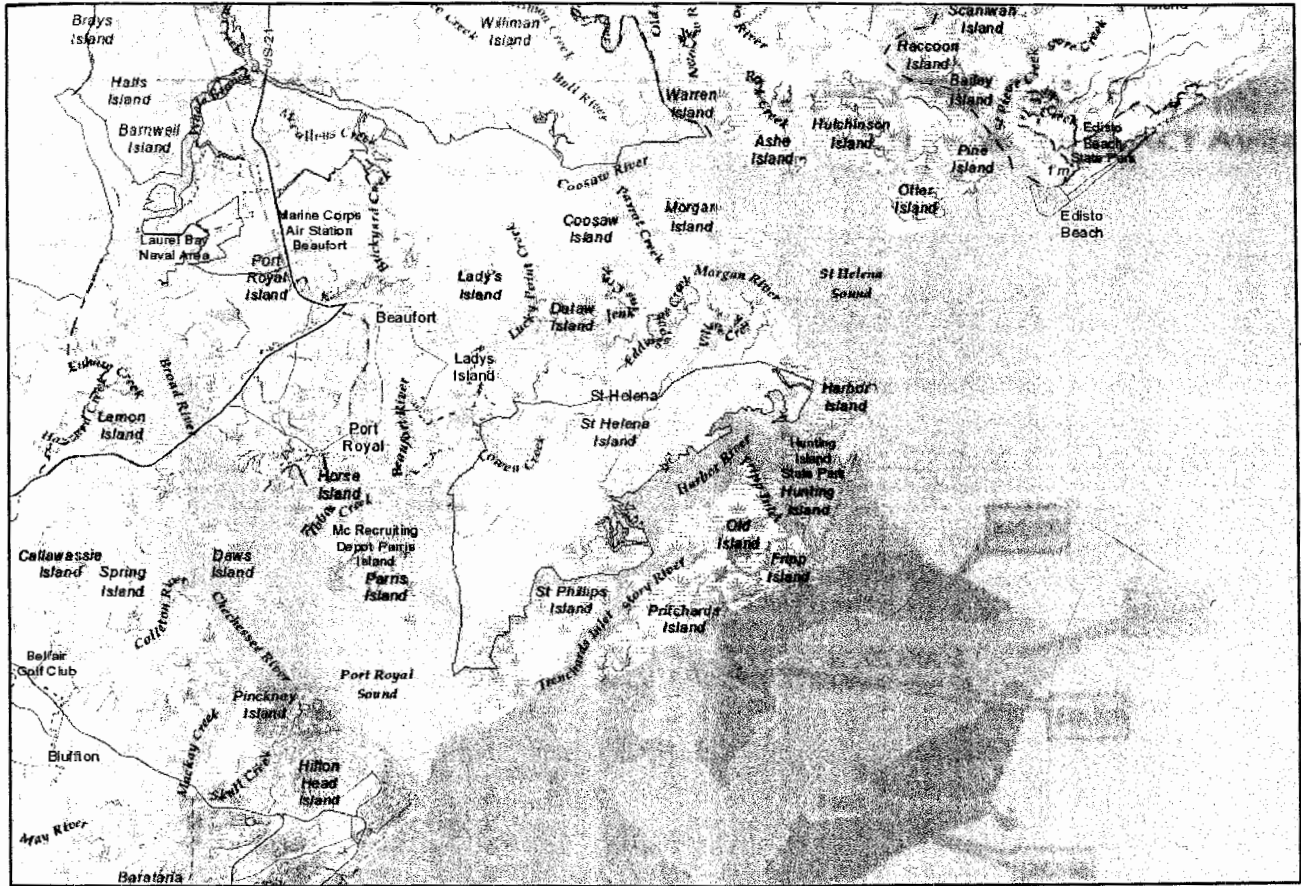


Figure 2: This map from the USDA Food Access Research Atlas website identifies St. Helena Island as a low-income area where a significant number of households have low vehicle access (USDA-ERS).

Table 1: Racial demographics for St. Helena Island as compared to Beaufort County and South Carolina.

	Total Population	African American (%)	Asian (%)	Latino (%)	White (%)	Other (%)	Poverty Level (%)
St. Helena Island	9,481	54.8	0.2	3.9	41.1	0	15.1
Beaufort County	162,233	19.3	1.2	12.1	71.9	0	7.4
South Carolina	4,625,364	27.9	1.3	5.1	66.2	0	12.7

Source: U.S. Census Bureau (2010).

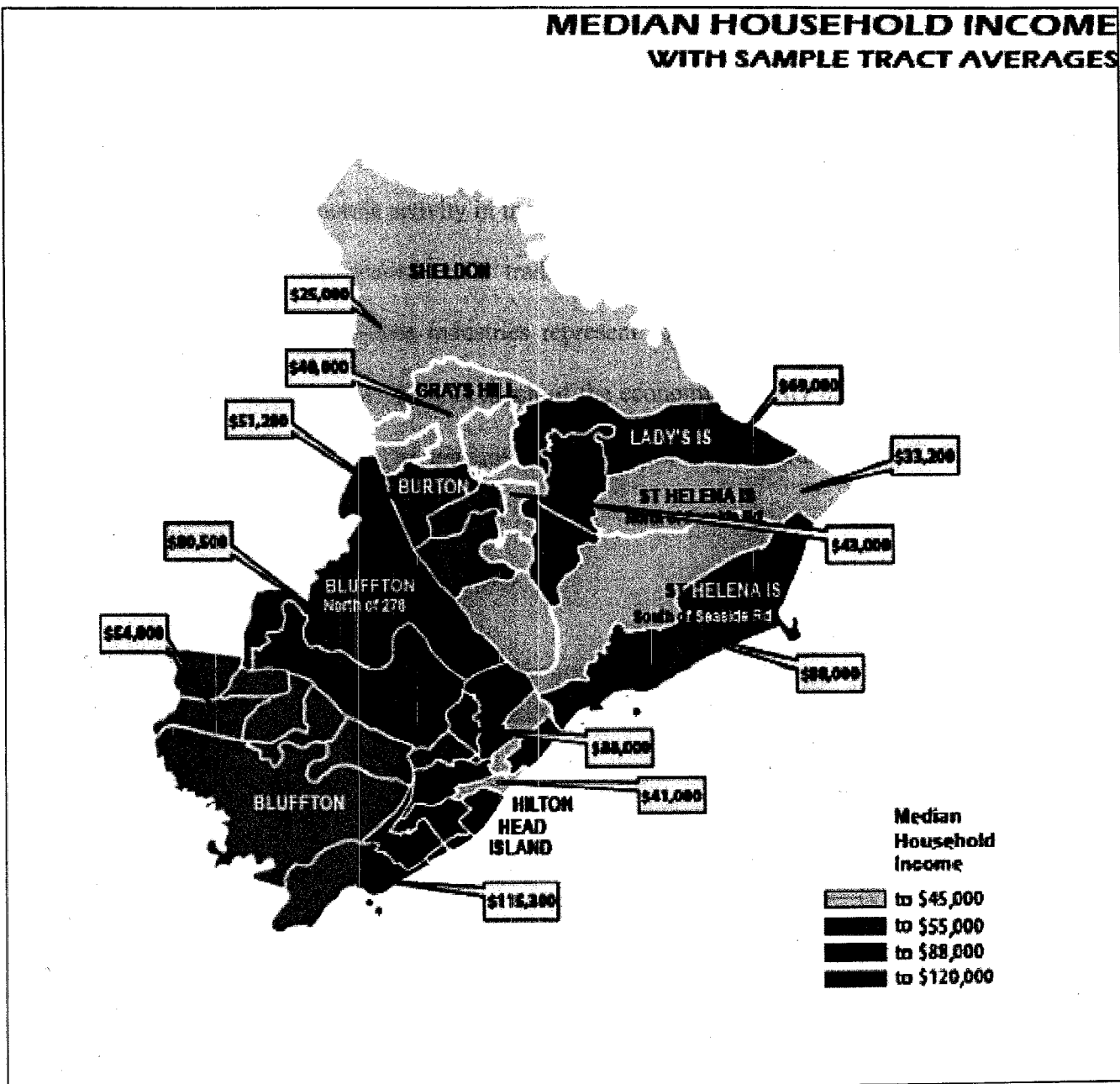


Figure 3: Map of the median household incomes for Beaufort County, including St. Helena Island's two census tracts, north and south of Seaside Road, Highway 21. <http://www.bcgov.net/departments/Planning-Development/planning/Demographic%20Handbook%202012.pdf>

## B. Economic Demographics

As of 2010, the median household income on St. Helena was \$33,200 (2010 Census). Major industries in Beaufort County (see Table 2 below) include construction, retail trade, real estate rental and leasing, and accommodation and food services. Together, these four industries encompass nearly 47% of the economic activity in the county. Similarly, the major industries on St. Helena Island include; construction, retail trade, real estate rental and leasing, and accommodation and food services. These industries represent roughly 37% of the economic activity on the island. As we can see in table 3, much of the economic activity in St. Helena is either directly or indirectly linked to the tourism industry (U.S. Census Bureau, 2007-2011 American Community Survey).

**Table 2: Major industrial activity in Beaufort County**

Industry	Estimated # of Establishments	Percent
Agriculture, forestry, fishing and hunting, and mining	773	1%
Construction	7,276	11%
Manufacturing	3,058	5%
Wholesale trade	1,202	2%
Retail trade	8,409	13%
Transportation and warehousing, and utilities	2,020	3%
Information	1,132	2%
Finance and insurance, and real estate and rental and leasing	4,892	8%
Professional, scientific, and management, and administrative and waste management services	8,260	13%
Educational services, and health care and social assistance	11,492	18%
Arts, entertainment, and recreation, and accommodation and food services	10,012	15%
Other services, except public administration	3,317	5%
Public administration	3,573	6%
		100.00%

Source: U.S. Census Bureau, 2007-2011 American Community Survey

**Table 3: Major industrial activity in St. Helena Island, South Carolina**

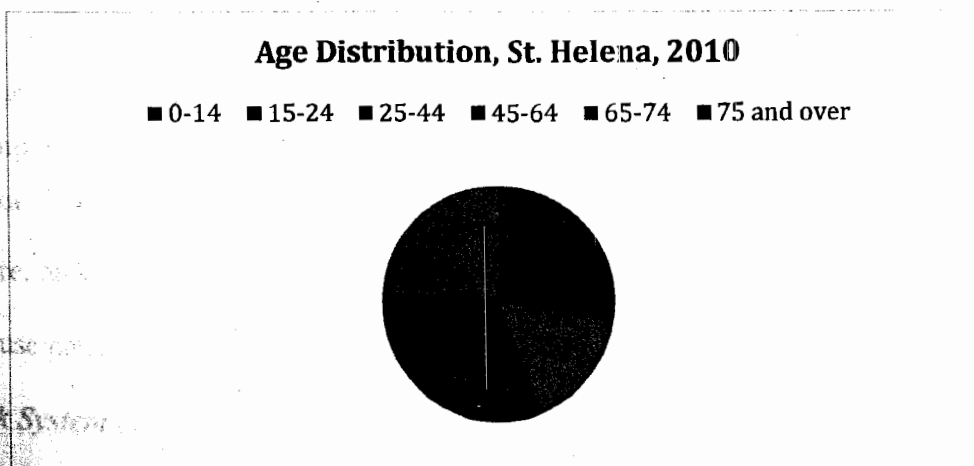
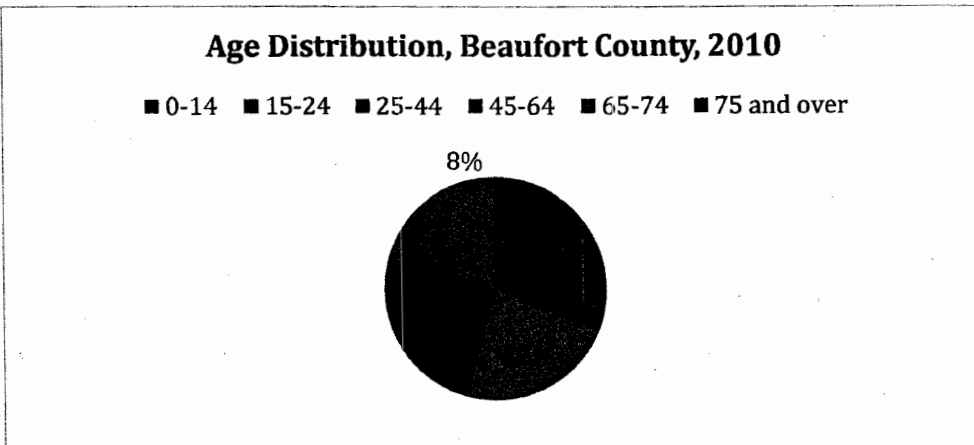
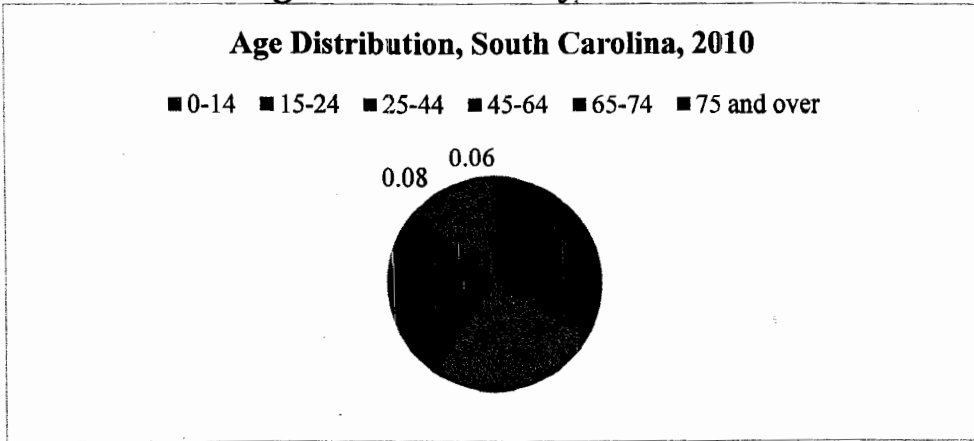
<b>Industry</b>	<b>Estimated # of Establishments</b>	<b>Percent</b>
Agriculture, forestry, fishing and hunting, and mining	69	2.40%
Construction	138	4.80%
Manufacturing	211	7.40%
Wholesale trade	168	5.90%
Retail trade	313	10.90%
Transportation and warehousing, and utilities	117	4.10%
Information	0	0.00%
Finance and insurance, and real estate and rental and leasing	110	3.80%
Professional, scientific, and management, and administrative and waste management services	316	11.00%
Educational services, and health care and social assistance	563	19.60%
Arts, entertainment, and recreation, and accommodation and food services	498	17.40%
Other services, except public administration	110	3.80%
Public administration	256	8.90%
		100.00%

Source: U.S. Census Bureau, 2007-2011 American Community Survey

In terms of age, 44% of the population of St. Helena is aged 45 or older, with a plurality of the population between the ages of 45-64 (32%). When compared to Beaufort county and the state of South Carolina, we see that trend is similar. For example, individuals aged 45-64 make up close to 25% in Beaufort County and 27% in South Carolina. Individuals in earlier stages of life (0-44) represent roughly 43 percent of the island's population. This figure is concerning when one considers the county and state figures, 50% and 60% respectively.

Figure 4: Age distribution in South Carolina, Beaufort County and Saint Helena. St. Helena Island shows a predominance of the population between the ages of 45 and 64. (US Census 2010)

### Age Distribution by Location



Source: U.S. Census Bureau, 2010 Census.

### **C. Historical Context**

The Sea Islands off the coast of South Carolina, Georgia and Florida, also known as the Low Country, have been home to the Gullah-Geechee community for the past three centuries. The Gullah-Geechee people are African Americans descended from enslaved people who worked the rice and cotton plantations in the Low Country regions of Georgia and South Carolina, and who continue to live on the mainland and the region's Sea Islands to this day. These people have a rich culture; more than any other African Americans, the Gullah-Geechee have been able to retain many of the aspects of West African culture, from language, to music, to land-use traditions (as described by Hazard, 2012). This unique and complex heritage has "enabled the Gullah to remain one of the most studied populations in the United States" (Pollitzer 1999).

Brabec and Richardson (2007) note, there are five factors that contribute to the complex social, economic and geographic fabric of the Gullah communities.

"Three of these—the importation of slaves directly from Africa, long after it was no longer legal; the fact that people of African heritage constituted a majority of the islands' population; and the isolation of St. Helena and the other Sea islands from the mainland—contributed to the strength of Gullah culture and community, including their expression in landscape pattern. Two additional factors—the task system of agriculture and the early purchase and allotment of land to former slaves—had specific impacts on the cultural importance of land, the physical expression of the community in the landscape."

For the purposes of this paper, we will explore the last two factors, the task system of agriculture, and the allotment of land to former slaves and how these two factors contributed to the land-use patterns on the island today.

#### ***The Task System of Agriculture***

Slaves brought to South Carolina to tend crops such as indigo, rice, and cotton were introduced to a form of slavery known as the "task-system". This system was distinctly different

from the gang system, where slaves worked in groups under the control of a driver, and were required to work the entire day (Gray, 1933 as cited in Brabec and Richardson 2007). Work on the plantation was divided into tasks. "Slaves were assigned a specific task for the day's work. Once the task was completed, the worker was in control of his or her time" (Brabec and Richardson, 2007).

Researchers have theorized that the task system allowed the slaves the free time to form their own communities, develop and practice their religion, devise their own amusement, provide extra subsistence for their own families, and even acquire wealth, through the production and barter of wares" (Rowland, Moore, and Rogers 1996, 353). That economy fostered a sense of identity and a degree of self-determination unusual in American slavery (Dennis 2000), and families could, at least to a certain extent, work together as an economic unit, strengthening the bonds of family and community. Historical documents of the period contain various references to the cultivation of fields by slave families in their 'off' time (Bremer 1853; Collins 1854; Olmsted 1904 as cited in Brabec and Richardson 2007). The tradition of subsistence farming continued after emancipation and into reconstruction. During a visit to the Sea Islands in the 1850's travel writer Fredrick Law Olmsted observed: "Between each tenement and the next house, is a small piece of ground.... In which are coops of fowl with chickens, hovels for nests and for sows with pig. In the rear of the yards were gardens – a half-acre to each family" (Olmsted, 1850 as cited in Brabec and Richardson 2007).



**Image 5: A group of Gullah homes and their individual and communal yards, in Beaufort County circa 1940. Source: Library of Congress, Circa 1940**

Along with the cultivation of vegetables and field crops, many raised their own livestock, trading within and without the confines of their plantation, often selling to the owner of the plantation. Other researchers have stated that most slave families cultivated four to five acres of land in corn, potatoes and other crops (Johnson 1930; Stewart 1996 as cited in Brabec and Richardson 2007). Figure 5 shows the typical appearance of many Gullah compound yards in South Carolina in the early 20<sup>th</sup> century. This expression of culture and community form on the land continues today.

#### *Allotment of Land to Former Slaves*

As Union troops moved into the South during the Civil War, the slaveholders fled the Sea Islands, and land was eventually sold to the former slaves in small parcels (Woofter 1930; Guthrie 1996 as cited in Brabec and Richardson 2007). These parcels were sold to families into a



legal system of ownership that became known as “heirs’ property”.

Heirs property generally refers to real property purchased by African Americans and held within family for generations without clear title (Rivers, 2006). Any piece of property can become heirs property if it is passed down from one generation to the next and a deceased individual’s name remains on the deed longer than a specified period of time (Lyons, 1993). This accepted understanding of the origins and problems of heirs’ property does not recognize a fundamental cultural norm with respect to land ownership that exists within the Gullah community. Originating in both African traditions and the system of land distribution after the Civil War, the Gullah concept of land ownership is both complex and radically different from the dominant white community. As was traditional in Africa (Twining and Baird 1991), land is understood within the Gullah community to be held in common ownership by the family. All members of the family, including the extended family, have a partial interest in the property (Brabec and Richardson, 2007).

Heirs property continues today in St. Helena. As a result, agriculture and subsistence farming remains an important and valued part of Gullah culture and tradition. There are many other rural communities in the United States that still have a connection to an agrarian past and heritage that maybe similar to the one found on St. Helena. Consequently, the CFA methods outlined in this study may also be applicable in detecting food access networks that may otherwise go unnoticed in those communities as well.

### 3. Methodology

We began our study with a Community Food Assessment (CFA). The goal of this CFA was to understand community characteristics related to the distribution and consumption of fresh produce, fish and shellfish. The method used for this CFA is comprised of three parts, (1) spatial analysis using Geographic Information System data (GIS); (2) a community food survey focused on where residents obtain their food; and (3) ethnographic interviews with local growers, subsistence farmers and consumers. We focused specifically on how the crops from family compound gardens were being distributed among the members of the community. The following is a detailed description of the steps involved in conducting the community food assessment.

The first step in our assessment was the identification of the compound gardens. There were two components to the identification process. First, the compound gardens were identified through a method called a "windshield analysis," in which data is gathered by observation from a moving vehicle. During the windshield analysis, the addresses of each garden visible from the roads were noted, and then later geocoded using ArcGIS 10.1. Figures 3-5 are examples of some of the gardens found during one of the many windshield analysis.

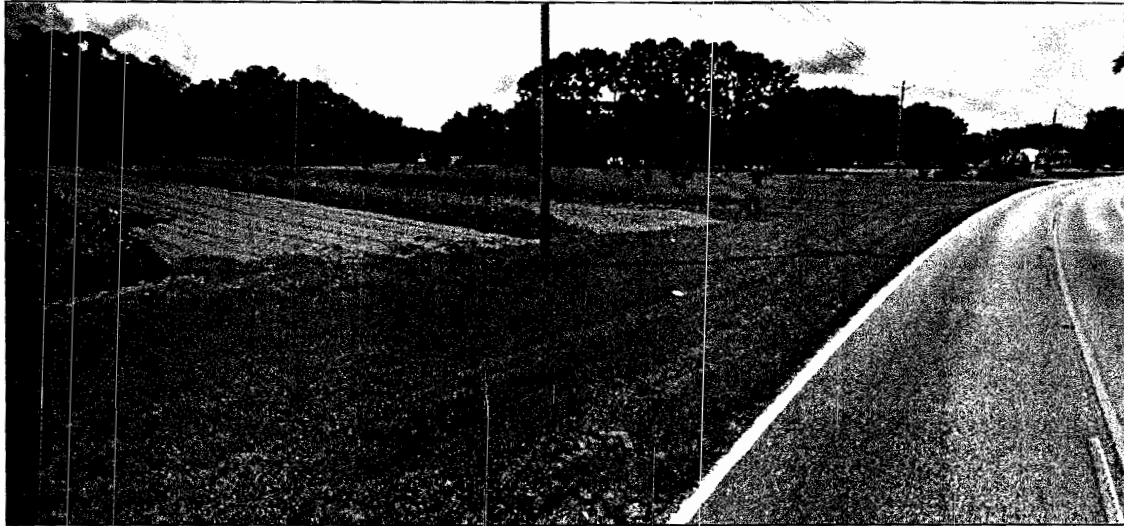


Figure 6: View of a typical family garden on St. Helena Island. Source: Google Maps, 2013.

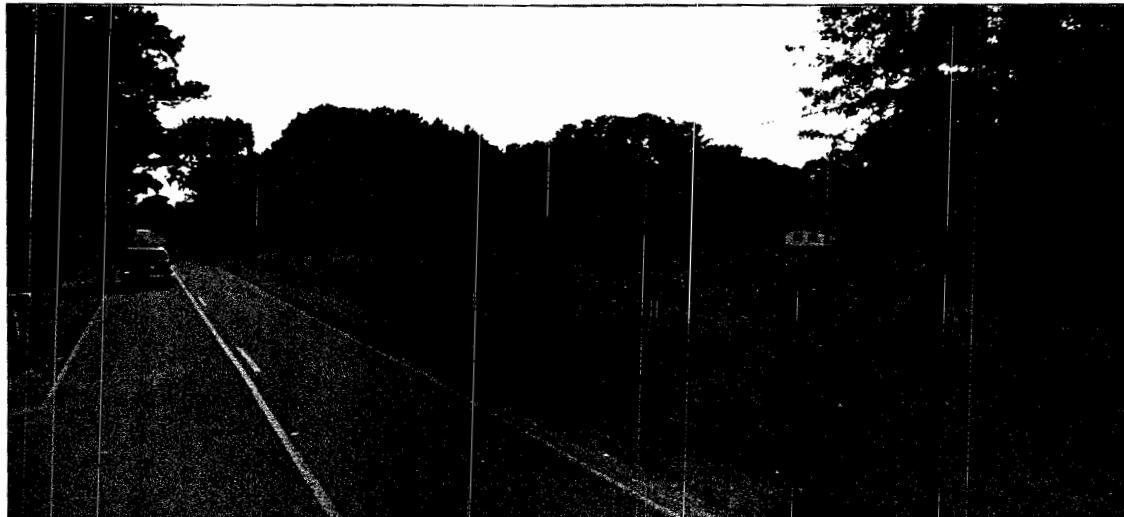
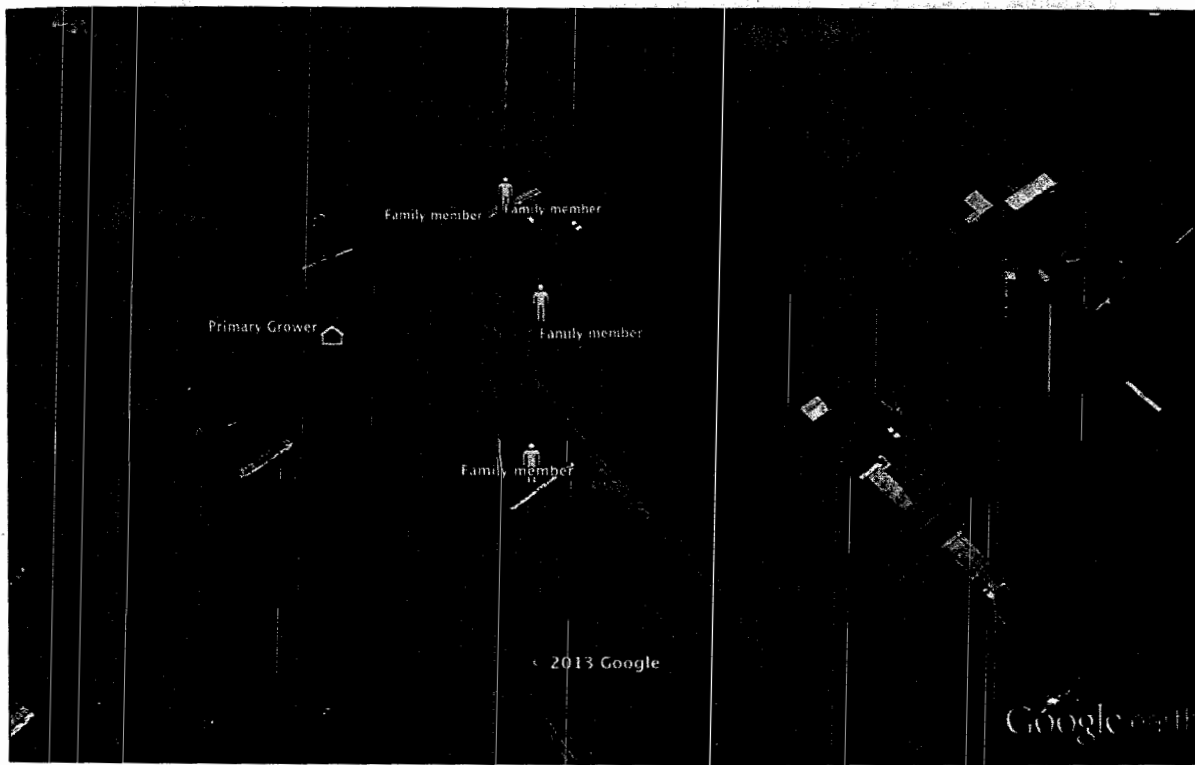


Figure 7: View of a second typical family garden on St. Helena Island. Source: Google Maps, 2013.



Figure 8: View of a fallow family garden plot at the end of the summer after harvest. Source: Google Maps, 2013.



**Figure 9: Example of a garden with associated family members' homes, aerial view Google Earth.**

We then utilized aerial photography on Google Earth to identify and plot any remaining gardens on St. Helena that were centrally located in relation to the family homes that may not have been logged on a windshield analysis. The above figure is an example of the positioning of one such garden. Once all the gardens were identified, the perimeter of each garden was outlined in Google Earth and converted to an ArcGIS shape-file. The shape-files were then transferred into ArcGIS 10.1 as a KMZ file for analysis (see figure 10).



Figure 10 Snapshot of ArcGIS Based Analysis of the of the garden in Figure 9

The second major component of the assessment was a 17-question consumer survey of island residents. Please refer to Appendix 1 for a full listing of the survey questions. While administering the survey, growers in the community were identified, and subsequently interviewed with an open-ended series of questions focused on cropping and sales activity.

## 4. Findings

### *Survey Results*

We had the opportunity to conduct survey 50 residents. The age of respondents ranged from 18-66+. Table 4 shows the age breakdown of all 50 respondents.

Table 4: Age range of the survey participants.

Age Range	Percent	Number of Participants
18-25	16%	8
26-40	26%	13
41-65	44%	22
66+	14%	7

100%

We began our study by asking participants where they obtained most of their food. A majority (51%) of respondents reported obtaining most of their food from a regional supermarket chain called Food Lion. The remaining respondents reported obtaining most of their food from Piggy Wiggly's (23%), Wal-Mart (26%), and 2% reported obtaining food from Sam's. According to Morton and Blanchard (2007), rural census tracts located more than 10 miles from supercenters are considered a food desert. Most of the residents on St. Helena live an average of eight miles from the nearest supermarket. We would argue that for our purposes, it is safe to assume that eight miles is also a long distance to travel to obtain food. When asked why food was purchased at these locations, 55% of respondents cited the low cost as the main reason why they shopped at the locations. 24% reported "proximity to home" as another reason for shopping at those locations. In addition to supermarkets, residents of St. Helena regularly gain access to three small farms that grow and sell local produce. These farms are Barefoot Farms, Otis Daise

& Son Inc. and Dempsey Farms. Many of the residents surveyed reported purchasing produce from these farms on a regular basis. Table 5 outlines the results.

Table 5: Farm stands and their reflection in the survey responses.

Farm Stand	% of residents that use this stand	# of Respondents
Barefoot Farms	43%	23
Otis Daise	17%	9
Dempsey Farms	7%	4
N/a	31%	17

Fish and shellfish are an important cultural element of Gullah culture and cuisine. As such, 21 % of respondents (7) reported either catching their own fish and shellfish or obtaining the fish from relatives that live on the island. Other respondents access fish from local retailers. 52% of the respondents reported purchasing fish from Bradley Seafood, a prominent fisherman on the islands. Other Local seafood locations frequented by locals include Eddings Point Seafood 9%, Sea Island, 9%, and Eagle Market, Gaye Seafood and CJ's Port Royal, all with 3% each.

### Gardens

As mentioned previously, subsistence farming is an important cultural norm for the Gullah communities. Many of the (45%) residents surveyed report keeping a garden. As reported by growers, common fruits and vegetables grown in these gardens are tomatoes, okra, squash, hot peppers, collard greens, cucumbers, watermelons, corn, sweet potatoes, peas and bell peppers. Of the 22 respondents who did keep a garden, 73% report sharing their harvest with friends, relatives or neighbors. Respondents that did not currently have their own family garden 66% (29) did report knowing a neighbor or family member who kept a garden and enjoyed regular access to shared their harvested crops.

The results of this survey suggest that the crop-sharing network on the island is significant and should be explored in other comparable rural communities.

These informal elements, such as produce stands, compound gardens, and faith-based access points and seafood stands, are not generally captured in methods measuring proximity. In the case of St. Helena, informal networks contribute greatly to the local food system. In fact, as one can see in the Food Chain Diagram in Appendix 5, these elements extend far beyond the island. Moreover, in ethnographic interviews with large and small scale farms, we learned that many farmers donate or sell a portion of their harvest to the Port Royal Farmer's Market and the Sea Island Local Outlet, a local food pantry. Furthermore, faith-based organizations such as churches have maintained an active informal role of receiving local produce and then distributing the products to needy families within their own congregations. The island has 20 faith-based organizations, and although we could not verify whether or not all organizations participate in such activity, it is quite possible that many if not most of these faith-based organizations participate in similar activities. We have confirmed such activities at two local churches.

### ***General Findings***

The preliminary findings of our CFA suggests that rural communities identified as food deserts may actually have substantially more access to fresh fruits, vegetables and other culturally significant foods than previously determined by quantitative based methodologies. In this study, we found that informal subsistence farming on St. Helena contributes significantly to the local food system. This mixed-method research approach enabled the identification of an expansive network of local production, processing and distribution of fruits and vegetables and fish products. The initial fieldwork indicates that during harvest, fresh produce is regularly dispersed, free of charge, throughout the community via "informal access points" such as front-



yard produce stands, food pantries at local places of worship and neighbor-to-neighbor sharing relationships. Of the 50 individuals surveyed, 75 percent regularly tap into this informal system to obtain fresh produce, fish and shellfish. We also found that residents regularly stored and preserved some type of produce during the non-growing season. These results support the findings of Short, et al. (2007) in which the study concludes that low-income communities within identified rural food deserts can and do routinely provide access to a wide variety of culturally acceptable foods for local consumption. The findings also suggest that measuring only the proximity to sources of retail food may not be enough to determine the level of food access in rural communities. Inhabitants in rural communities, especially ones with strong agrarian past may actually still employ small-scale farming to supplement the local food supply.

The results in the study also suggest that, while supermarkets are a great source of food variety and quality, siting more supermarkets is not the only method of improving the food options and accessibility in communities of need. This sentiment is echoed by Apparicio et al. (2007).

Even from a purely geographic perspective, supermarkets are not the only food retailers where good and healthy food can be bought. Without being unduly optimistic, other food retailers such as fruit and vegetable shops, specialty stores (butcher, fishmonger) and ethnic grocery shops may be present in deprived areas with poor accessibility to supermarkets. It is possible that purchases at these various small stores offer a range of healthy food products. The presence of smaller or independent grocery shops could thus fill the gap caused by the absence of supermarkets (p. 10).

Lastly, the results from our study suggest that rather than soliciting supermarkets, creative planning and policy support for networks of existing small scale fruit and vegetable

gardeners may be a “more efficient strategy for ensuring access to healthful foods within minority neighborhoods” (Raj, 2008). Understanding informal networks at the community level has implications for other planning objects such as community development. For example, locating and understanding networks like these (if they exist) in urban communities could have a positive impact on neighborhood cohesion by identifying key leaders and the production and flow of information that could then be used to inform the creation of neighborhood associations and groups that would have the power to effect positive change in communities of need. We must fully utilize all the resource we have at our disposal to identify both the areas of improvement with a community and its assets to foster long lasting and positive change.

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### Consumer Survey Questions

1. Where do you go to buy your fresh groceries or fresh food?
2. Why do you buy most of your food there?
3. How do you usually get there?
4. Do you buy fresh fruits and vegetables at a local farm stand?
5. Do you buy fresh fish/ shrimp or shellfish at a local market or stand?
6. Do you have a home garden?
7. What kind of fruits and vegetables do you grow?
8. Do you share your harvest with anyone?
9. How do you preserve extra fruits or vegetables at harvest?
10. Do relatives or neighbors share the harvest from their garden with you?
11. Do you know other families who have gardens?
12. Do you keep livestock?
13. Do you fish or crab?
14. Do you hunt (on the island)?
15. What is your age?
16. Do you identify as male or female?
17. How many people are in your family household?

pedro soto

Edit this form

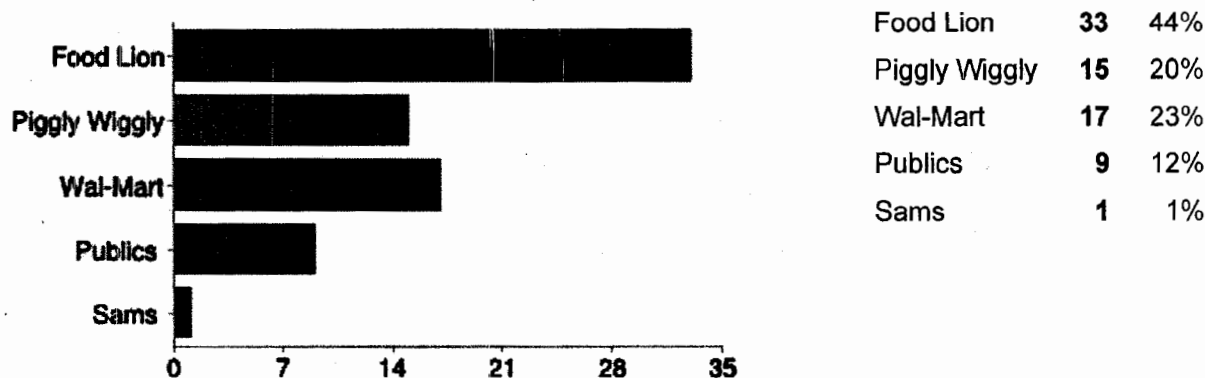
# 50 responses

[View all responses](#)

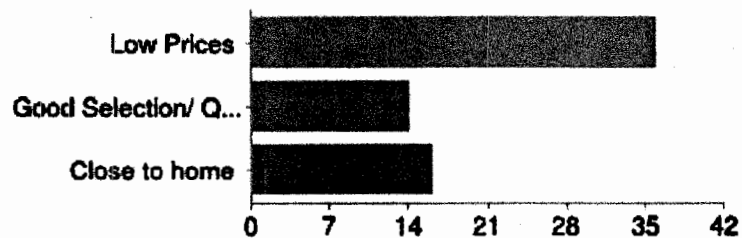
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## Summary

### 1. Where do you go to buy your fresh groceries or fresh food?



### 2. Why do you buy most of your food there?



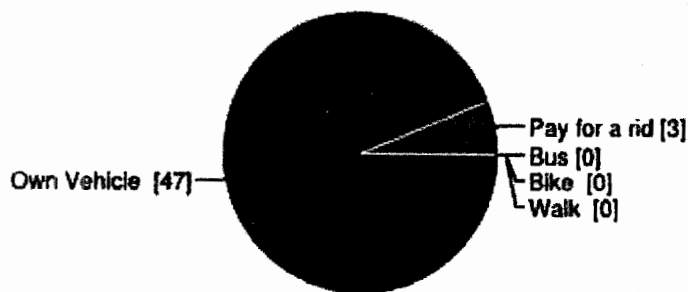
Low Prices 36 55%

Good Selection/ Quality 14 21%

Close to home 16 24%

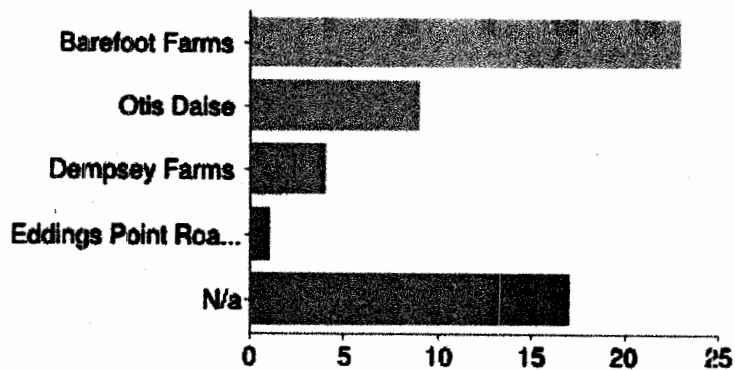
### 3. How do you usually get there?





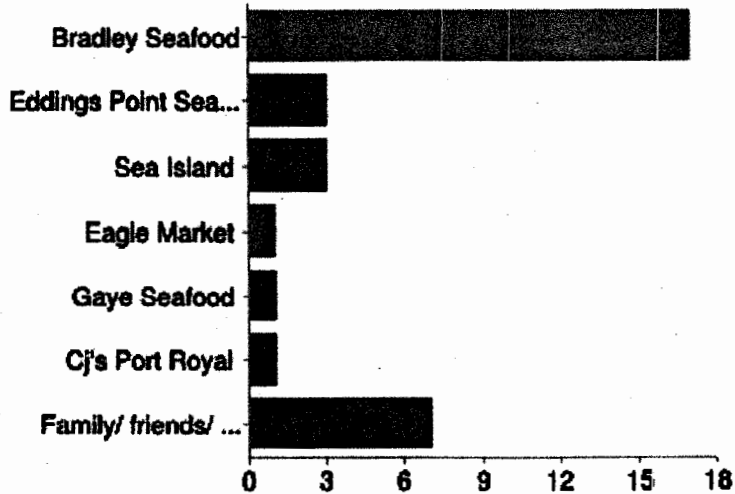
Bus	0	0%
Own Vehicle	47	94%
Pay for a ride	3	6%
Bike	0	0%
Walk	0	0%

4. Do you buy fresh fruits and vegetables at a local farm stand?



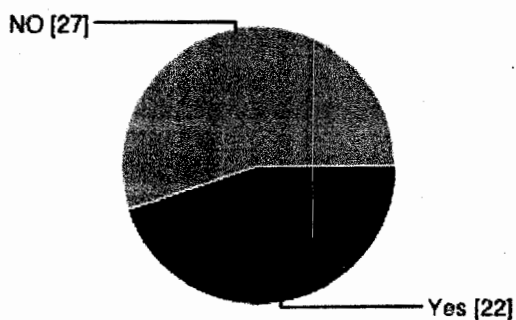
Barefoot Farms	23	43%
Otis Daise	9	17%
Dempsey Farms	4	7%
Eddings Point Road Farmstand	1	2%
N/a	17	31%

5. Do you buy fresh fish/ shrimp or shellfish at a local market or stand?



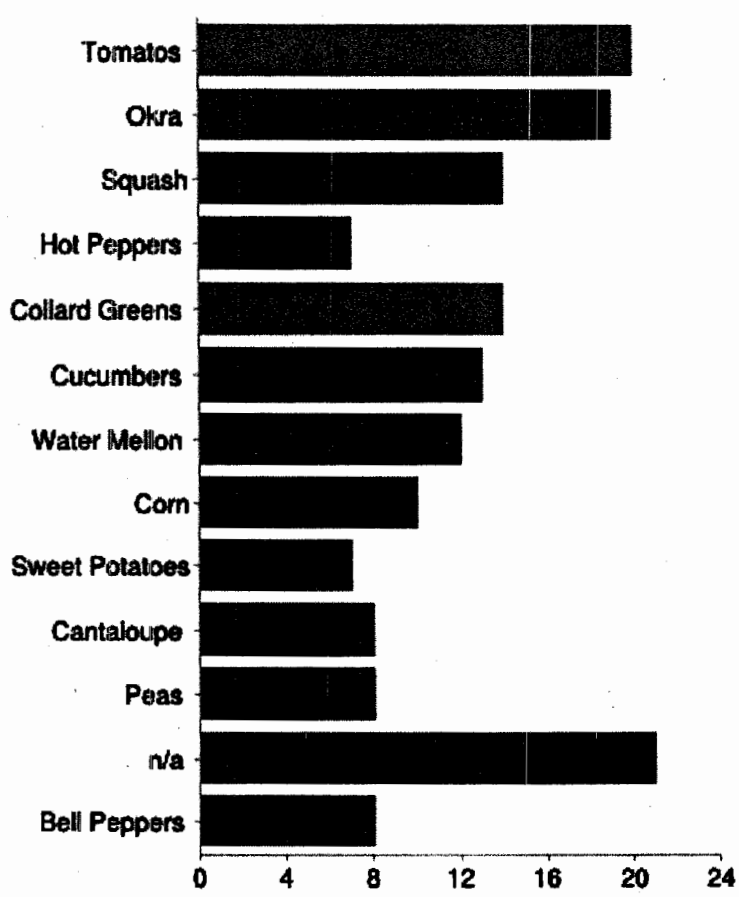
Bradley Seafood	17	52%
Eddings Point Seafood	3	9%
Sea Island	3	9%
Eagle Market	1	3%
Gaye Seafood	1	3%
Cj's Port Royal	1	3%
Family/ friends/ Catch themselves	7	21%

**6. Do you have a home garden?**



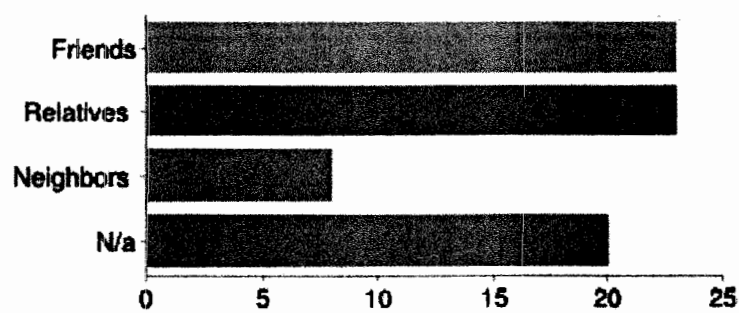
Yes	22	45%
NO	27	55%

**7. What kind of fruits and vegetables do you grow?**



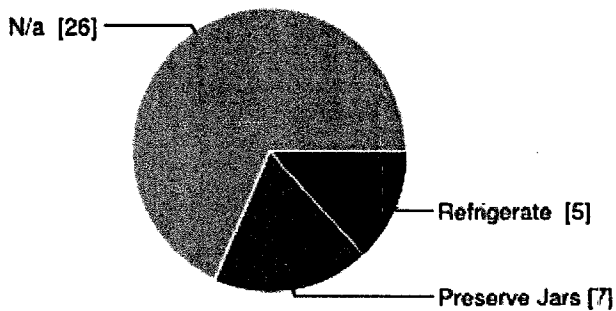
Tomatos	20	12%
Okra	19	12%
Squash	14	9%
Hot Peppers	7	4%
Collard Greens	14	9%
Cucumbers	13	8%
Water Mellon	12	7%
Corn	10	6%
Sweet Potatoes	7	4%
Cantaloupe	8	5%
Peas	8	5%
n/a	21	13%
Bell Peppers	8	5%

8. Do you share your harvest with anyone?



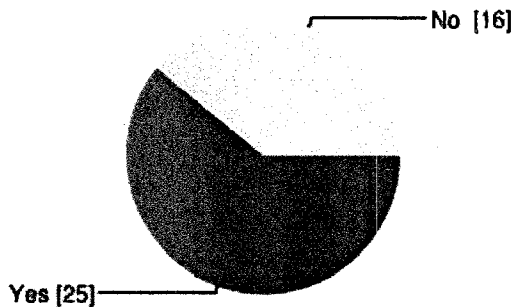
Friends	23	31%
Relatives	23	31%
Neighbors	8	11%
N/a	20	27%

9. How do you preserve extra fruits or vegetables at harvest?



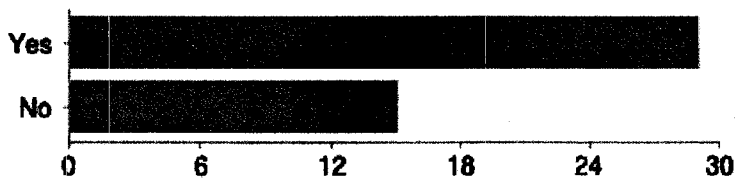
Refrigerate	5	13%
Preserve Jars	7	18%
N/a	26	68%

**10. Do relatives or neighbors share the harvest from their garden with you?**



Yes	25	61%
No	16	39%

**11. Do you know other families who have gardens?**

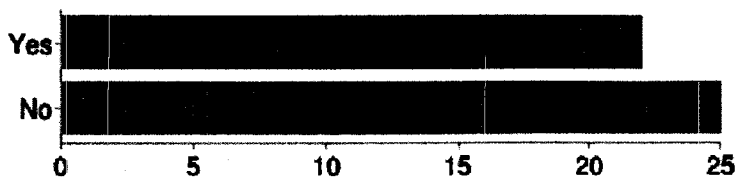


Yes	29	66%
No	15	34%

**12. Do you keep livestock?**

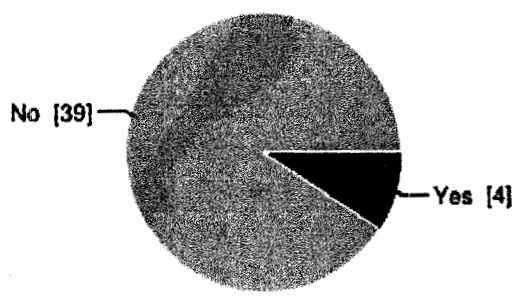
no N/a No 5 Yes, chickens No n/a n/a cows, hogs cows

**13. Do you fish or crab?**



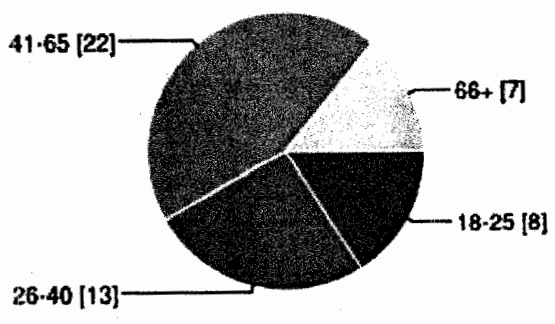
Yes	22	47%
No	25	53%

**14. Do you hunt?**



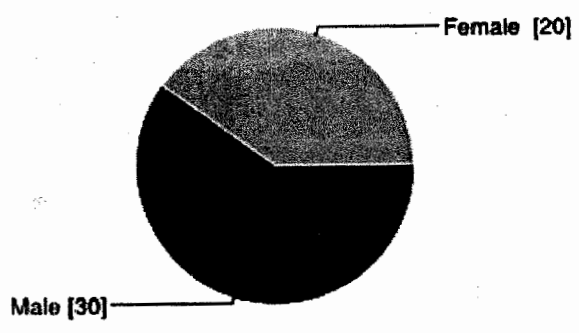
Yes	4	9%
No	39	91%

15. what is your age range?



18-25	8	16%
26-40	13	26%
41-65	22	44%
66+	7	14%

16. Male/ Female



Male	30	60%
Female	20	40%

17. How many people are in your family household?

N/a No 3 2 1 6 5 4 8 n/a

Number of daily responses