PLANNING TO GROW: EXPLORING THE FEASIBILITY OF A SUSTAINABLE REGIONAL FOOD HUB IN RURAL EAST CENTRAL GEORGIA

by

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(Under the Direction of Carol A. Couch)

ABSTRACT

With rising consumer interest in and demand for locally grown food, new opportunities are emerging for small and mid-size farms that are classified as being in the "agriculture of the middle." These farms fall between mainstream commodity farms and small direct-to-consumer markets. To take advantage of the new opportunities, rural communities should employ planning professionals to do food system planning who understand the complexity and variability in the food system with an eye to sustainability. A methodology is developed to identify areas where potential food hubs might thrive based on criteria derived from existing food hubs and other literature on direct-to-consumer markets. Using specific criteria indicators, an 11 county study region in rural East Central Georgia emerges between four metropolitan areas where a food hub could be pursued as a regional economic development strategy. Specific recommendations are given for establishing a food hub in this region.

INDEX WORDS: agriculture of the middle, economic development, farms, farming, food, food distribution, food economy, food planning, food systems, Georgia, regional development, regional planning, sustainability.

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DEDICATION

I would like to dedicate this thesis to Heath Tucker for his unwavering love, support, and encouragement in all aspects of my life.

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I would like to thank Carol Couch, first and foremost, for helping me shepherd my thesis through the process. Carol, you've given me encouragement, insight, and deadlines right when I've needed them with an infectious calm levelheadedness.

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CHAPTER 1

INTRODUCTION

Food is a necessity. We all must eat. Despite our fundamental biological dependence on it, food has become largely unmoored in our lives, existing solely as a commodity to be purchased, consumed, and discarded without giving much thought to where or how it comes to us. The supply chains that deliver us food have become so long and obscure that tracing them back to their sources is nearly impossible for the average consumer and extremely difficult for regulators overseeing our food's health and safety (Archer, 2010).

Consumers are clamoring for alternative relationships with their food for many reasons (Guptill & Wilkins, 2002). Some consumers are interested in minimizing their impact on the natural world and protecting the environment (Smith, 2007). Some are interested in building local economies and keeping money generated in their communities circulating there (Abate, 2008; Kane, Wolfe, Jones, & McKissick, 2010). Some consumers are looking to (re)connect with their communities and celebrate cultural traditions around food (Nabhan, 2002; Trauger, Sachs, Barbercheck, Brasier, & Kiernan, 2010). Some are concerned with protecting farmland from development (AFT, 1987; Esseks, Oberholtzer, Clancy, Lapping, & Zurbrugg, 2009). Some are just looking for a future in farming for the next generation. Some consumers just want food that tastes good.

The convergence of multiple movements and stakeholders supporting local food choices constitutes the local food movement. The local food movement seeks to decrease the distance our food travels from farm to consumer and, hopefully, address many of the concerns listed

above. There has been undeniable growth in consumer interest in locally grown food across the country (Bragg & Barham, 2010; Guptill & Wilkins, 2002; Kirschenmann, Stevenson, Buttel, Lyson, & Duffy, 2005; Martinez et al., 2010). Due to the breadth of issues it addresses, the local food movement transcends the cultural and political binaries of liberal and conservative and points to systemic problems within the current configuration of our food system.

Although there is increased demand for locally grown food, structural issues of food production are preventing more locally grown food from entering the market. Thomas Lyson identifies a dual structure of agricultural production consisting of larger, more capital intensive, commodity production farms on one side, and less capital intensive, small[1] farms on the other (Lyson, 1986). The large production farms compete in a global marketplace through regional specialization, technological innovation, and economies of scale. Products from these farms fill the shelves of grocery stores across the country and export goods around the world. These are the farms that got big when then US Secretary of Agriculture Earl Butz famously told farmers in the early 1970s, "Get big or get out."

Many small farms did not heed Butz's advice. They remained small and found some way to hold on, if only barely. One strategy for holding on is to pursue off-farm employment (Lyson,

[1] The USDA groups farms as small family farms with sales of less than $250,000, and other farms. Small farms are then subdivided into five subcategories: (1) Limit-resource farms with gross sales less than $100,000 and total principal operator household income of less than $20,000, (2) Retirement farms with sales less than $250,000 and the principle operator reports being retired, (3) Residential/lifestyle farms with sales less then $250,000 and the principle operator reports primary occupation as other than farming, (4) Lower sales farms with sales less than $100,000 and the principle operator reports farming as primary occupation, (5) Higher sales farms with sales between $100,000 and $249,999 (NASS, 2009a). This thesis will refer to small farms as those with sales less than $100,000 and without principle operators reporting primary occupation other than farming, mid-sized farms as farms making less than $250,000 or with principle operators reporting farming as their primary occupation, and larger farms as those making more than $250,000 and principle operators reporting farming as their primary occupation.

1986). Another strategy is turning to direct-to-consumer markets, like farmers' markets and CSAs[2], in an effort to capture a retail price for their produce that is sufficient for the business to remain financially viable (Gale, 1997). The current profile of farms engaged in direct farm-to-consumer marketing, or direct sales,[3] is one of smaller acreage, more diversified production and with younger and/or beginning owner/operators located in or close to metropolitan areas. "Access to urban markets is crucial to farms engaged in direct sales" (Martinez et al., 2010, p. 18). Studies reviewing the last 20 years of data have consistently shown that if farms are situated too far away from metropolitan areas, the average direct sales per farm decreases almost 40% (Gale, 1997; Martinez et al., 2010).

However, these small farms are encountering barriers in scaling up their operations to meet the growing demand. First, farms engaged in direct sales have taken on all the marketing and administrative functions normally handled by agri-business companies and retailers. The time spent marketing food, e.g. attending farmers' markets, represents time that cannot be spent farming. Each farm finds the balance between time spent growing food and time spent cultivating direct market outlets to sell the food. After a certain point, farmers are not able to attend additional markets, unless the farm scales up by hire additional workers – an expensive jump in farm labor expenses that may not make economic sense to the farmer.

[2] CSA (Community Supported Agriculture) is special type of direct farm-to-consumer arrangement where group of consumers invest in a farm or group of farms at the beginning of the season with the understanding that the farm(s) will provide a certain amount of goods over a certain period of time.

[3] The USDA uses direct-to-consumer marketing, or direct sales, as proxy for quantifying the local food movement. Direct-to-consumer marketing and direct sales represent the value of agricultural products sold directly to individuals for human consumption. Direct-to-consumer marketing and direct sales information has been collected on the 1992, 1997, 2002, and 2007 Census of Agriculture.

Second, the majority of farms engaged in direct sales are in or adjacent to metropolitan areas and tend to face increased development pressure and property taxes as a result (AFT, 1987; Esseks et al., 2009). Additional financial burdens like these mean small farmers need to maximize the price per acre for all products. They accomplish this by capturing a retail price for their products through direct sale marketing, cutting out all middlemen. Finally, these farms, individually, often lack the capacity to supply larger retail and institutional outlets.

The chart below illustrates the dual structure of agriculture in the US. Farms earning less than $10,000 a year in agricultural sales at the 2007 Census of Agriculture represent 59.8% of all farms in the US and account for 1.1% of the country's agricultural sales. Meanwhile, farms earning $250,000 or more a year in agricultural sales represent just 9.5% of the farms in the US but account for 84.7% of all agricultural sales. In the US, those farms making between $10,000 and $250,000 in sales a year represent 30.7% of farms and account for 14.2% in agricultural sales.

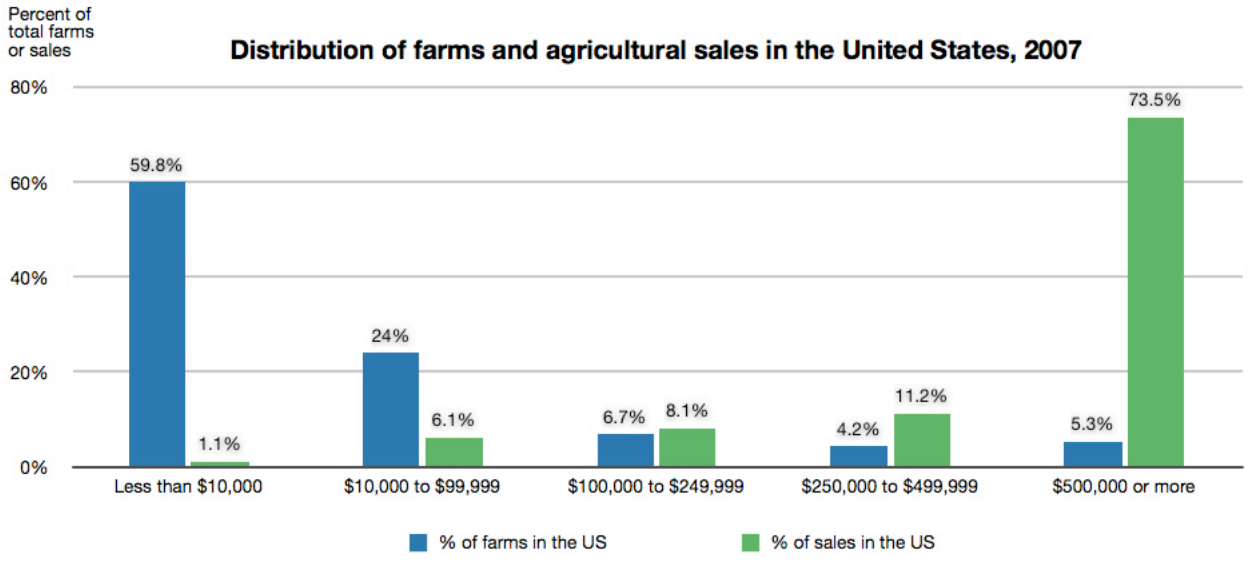


Figure 1.1: Distribution of farms and agricultural sales in the United States. Data Source: USDA 2007 Census of Agriculture

During the bifurcation of agricultural production into this dual structure occurring over decades, mid-sized farms, the "agriculture of the middle," has been lost (Kirschenmann et al., 2005; Lyson, 1986). These mid-sized farms are too large to depend solely on direct-to-consumer markets, but too small to compete in a global market place. Their scale requires more labor and attention than can be managed if farming is not the operator's primary occupation. As these farms have disappeared, so too have the small and mid-scale processors and distributors and other infrastructure that supported them. As these small and mid-scale infrastructures have disappeared, the remaining mid-sized farms still engaged in farming find increasingly more cards stacked against them. As the farms and infrastructure have disappeared, the surrounding, economically dependent regions have also declined. Many rural regions, despite numerous efforts to attract alternative industries and employment, have been left behind economically. This is especially true in the South (Dabson, 2009; Lyson, 1989).

These mid-sized farms are still capable of growing food, feeding people, and contributing to their rural economics, just not in a globalized marketplace. With growing consumer demand for locally grown produce, new economic development opportunities are emerging. Mid-sized farms have the capacity to scale up and serve this growing niche (Kirschenmann et al., 2005) with proper planning, coordination, cooperation, and investment in appropriately scaled support infrastructure.

This thesis examines issues surrounding the scaling up of the local food movement in a particular type of region as an economic development strategy for the long-term viability of farming on mid-sized farms and the agriculture of the middle. This thesis explores how the food system – production, processing, distribution, retailing, and consumption of food – might be reorganized within a region, and examines the role that professional planners can play in

identifying appropriate areas for (re)building regional food systems, coordinating cooperation between stake holders, and incorporating food systems and sustainability into long range comprehensive planning.

Economics, at its core, is about supply and demand. There are many factors contributing to the increasing demand for local food. Locally grown food must therefore be consciously and intentionally marketed as locally grown. The proximity of the food's origin to the consumer makes locally grown food a value-added product. At farmers' markets, CSAs, and other direct sale markets, the value-added of locally grown food is obvious and clearly communicated to the consumer. The farmer who grew their food is close enough to be present at these direct sale outlets, providing the assurance of localness. Once a third party is introduced into the equation, whether the third party be a grocer, restaurant, or institution, additional information is needed to clearly communicate the value-added qualities of locally grown food, i.e. that it is in fact locally grown[4]. For example, a restaurant might include the name of the farm that an ingredient was sourced from on the menu. So when a customer is looking over the menu and is interested in supporting the local food movement for whatever reason, he/she can decide to order the particular dish using locally grown ingredients. The communication of the uniqueness of products through intermediary parties is called a value-added supply chain.

Normally in an industrial food system, food is commoditized, meaning many characteristics distinguishing one similar item from another are stripped away so the item becomes undifferentiated from similar items. This process of commoditization means that similar items can be substituted for one another without the customers perceiving a difference. For example, the distinguishing characteristics of a carrot are either planned to be the same

[4] For some consumers, the principle value-added in locally grown food is the direct relationship between them and the people growing their food itself.

(varietal, size, shape, etc.) or removed (where it was grown, how it was grown, who grew it, etc.) so a consumer purchasing two bags of carrots from a typical grocery store does not know if the all carrots came from the same farm or different farms, or where those farms are in relation to him/her[5]. Commoditization also makes goods cheaper because there are no perceived differences and no reason to pay more for one bag of carrots over another.

Value-added supply chains seek to reverse the trend of commoditization by intentionally differentiating products and creating demand for these differentiated products. Consumers, able to distinguish between products, can then decide whether to pay a premium for a particular product. In turn, this premium paid in the retail outlet makes it back to the farm. Rather than taking the lower commodity price for his/her products, a farmer can get a higher wholesale price for his/her products, although this price will still be less than the retail price from a direct sale market. Value-added supply chains change the dynamic of consumption, creating consumer demand, increasing consumer choice, and providing farmers with additional markets for their products.

To take advantage of increasing demand, small and mid-sized farms need to expand supply beyond direct-sale markets to include these retail outlets and institutional buyers. However, as previously stated, appropriately scaled support infrastructures for small and mid-size farms have nearly disappeared. Individual small and mid-sized farms do not have the production capacity to supply retail markets on their own. Nor do individual small and mid-sized farms have the capacity for the complex tasks of branding and marketing to ensure

[5] Regarding origin, the USDA requires mandatory country of origin labeling for certain food products including meat, fish, shellfish, perishable commodities, certain nuts and ginseng. The final rule went into effect on March 16, 2009 and is administered and enforced through the Agricultural Marketing Service (AMS, 2011).

differentiation of value-added products. To scale up, the support infrastructures need to be (re)built which takes time, coordination, and financing.

In the interim, farmers looking to scale-up production can move locally-grown products through conventional industrial distribution channels while emphasizing the value-added (locally grown) characteristics of their products. Again, the goal of a value-added supply chain is to provide transparency and to clearly communicate the message that local products are value-added products via the proximity, freshness, and overall quality afforded them by local farmers. This method allows farmers to capture a premium wholesale price for their products through value-added supply chains without the cost and complexity of providing their own distribution and marketing. Scholars are evaluating how effective this approach is. They argue that value-added chains moving through industrial distribution systems should only be seen as a stopgap measure until more regional distribution chains can be established and regional relationships can be (re)built. Additionally, they question the long-term ability of a value-added supply chain using existing infrastructure to challenge the status quo of the industrial food system and provide a comprehensive alternative local food system (Bloom & Hinrichs, 2010).

Ideally, regionally scaled infrastructure exists to get scaled up production to market that does not have to work against the commoditization tendencies of existing industrial infrastructure. One emerging model of regionally scaled infrastructure is called a "food hub". While the definition is still a working one, regional food hubs are characterized by some centralized facility with a business structure in place – whether that be a non-profit organization, a farmer cooperative, or a sole proprietorship corporation – that facilitates the aggregation, storage, sorting and distribution of food. A food hub also can include value-added processing and marketing of products (Bragg & Barham, 2010; King et al., 2010; Martinez et al., 2010).

Importantly, a food hub still depends on communicating the value-added qualities of locally grown food.

Recent literature reviews have examined 72 case studies[6] on direct farm-to-consumer markets, value-added supply chains and food hubs across the country (Bragg & Barham, 2010; Esseks et al., 2009; King et al., 2010; Martinez et al., 2010; Shuman, Barron, & Wasserman, 2009). The spatial distribution of the case studies in the available literature is not equitable. Of the 72 case studies reviewed, only ten case studies (14%) are from the South and only one case study was from Georgia, which is a study of consumer perceptions and preferences for food processed in Georgia (Wolfe, 2002).

This underrepresentation of the South reflects less coordinated efforts and fewer existing models for scaling up the local food movement in the South. Additional research of food hubs, based in underrepresented areas such as Georgia, clearly needs to be undertaken. However, in the absence of this research, this thesis shifts focus from describing existing regionally-scaled food system models to exploring the possibilities for regionally scaled food system models.

To begin this research into potential food hubs, I have developed a methodology using a set of criteria that are derived from common elements of successful regional food models. I chose specific indicators for each of the criteria for which national county-level data exists, and that can be mapped spatially using Geographic Information Systems (GIS). This methodology is intended to be a first step in identifying areas for potential food hubs. Once a rough area is identified, a food system assessment is conducted to describe the area in greater detail, again relying mainly on publically available quantitative data. Concurrent with or immediately following a food system assessment, community stakeholders within the region could provide a

[6] A few of the case studies were duplications across articles.

finer grained picture of the area, richer with history, social and political relationships, culture, and other qualitative characteristics undoubtedly a key characteristic for any complex, coordinated community venue such as a regional food hub. However, this finer, qualitative, community-based analysis is beyond the scope of this thesis. While this methodology is applied to Georgia, it has national applicability to identify regions across the country where food hubs could be a viable economic development strategy.

Chapter Outlines

Chapter 2 provides a definition of food system, establishing a vocabulary for distinction between various kinds of food systems, followed by a definition of sustainability, which provides a framework for evaluating food systems. The history and distinguishing characteristics of the industrial food system is examined, followed by look at alternatives. In the US, more attention as been paid to changes in agricultural production, like under the USDA National Organic Program, Certified Natural Grown, and sustainable agriculture, rather than at the food system as a whole. Local food systems attempt to take a wider lens, embedding the food system within a geographically restrained area. However, local food systems are still vulnerable to the negative aspects of industrial agriculture, just on a smaller scale. Civic agriculture presents a comprehensive food system embedded in a community and reflecting a community's goals and values. This chapter provides background and common language for professional and community discussions about establishing goals for our agricultural production and food systems.

Chapter 3 explores the relationship between the planning profession and food systems. Although traditionally outside the realm of professional planning, scholars have called for this separation to be reexamined. The American Planning Association, in turn, has identified and

recommended policies to support community and regional food systems. However, there is a professional planning bias toward urban issues and environments that overlooks the critical need for food system planning from the perspective of rural communities where the majority of food is and can be grown. "There are inherent challenges associated with low density and remoteness that lead to diseconomies of scale and high costs of service delivery. There are the consequences of long-term policy neglect that have led to under-investment in infrastructure, diminishing availability of financial and human capital, and weak institutional capacity" (Dabson, 2009, p. 107). Restated, rural communities would benefit greatly from planning, but traditionally they do not have the resources to do this planning.

Moving beyond conceptual definitions and vague policies, I create a methodology in Chapter 4 for identifying spatially bounded regions in order to conduct a contextual feasibility study for (re)building regional food systems. A set of criteria is established for identifying ideal areas where a regional food hub might flourish. These criteria are entered into a GIS program to look for an ideal area in the state of Georgia. An eleven county region in rural East Central Georgia, consisting of Baldwin, Glascock, Greene, Hancock, Jefferson, Morgan, Putnam, Taliaferro, Warren, Washington and Wilkinson counties, emerges as a prime location for a regional food hub. The identified study area represents part of the rural historic African American Southern cotton belt with disproportionately high persistent poverty, low education attainment rates, and limited employment opportunities (Doherty & McKissick, 2002; Lyson, 1989; Partridge & Rickman, 2005).

Chapter 5 describe the region identified in Chapter 4 using a food system assessment. The food system assessment covers demographic and employment data, agricultural resources, food distribution, and the food economy for the region.

In Chapter 6, I reexamine the dual structure of agriculture in the US that has left the agriculture of the middle behind. The chapter also identifies the new opportunities for the agriculture of the middle in farm-to-firm marketing. This farm-to-firm marketing requires additional infrastructure and coordination afforded by establishing regional food hubs. This chapter identifies elements of a food hub and provides recommendations to the region based on the food system assessment.

Chapter 7 focuses on the next steps. For the 11-county study region, this thesis represents an academic feasibility study without much input or feedback from the communities for which the study was developed. If this plan were to become a reality there would have to be broad public participation and investment from a range of stakeholders. Looking more broadly at the local food movement across the country, the methodology developed in this thesis needs to be tested against the current food hub models to see if it accurately predicts the development of food hubs before being more widely applied to identify potential food hubs.

CHAPTER 2

EXPLORING FOOD SYSTEMS AND SUSTAINABILITY: DEFINITIONS AND CONCEPTS

This chapter explores definitions for food system and sustainability and then looks at various configurations of existing food systems in the context of these definitions. The definition of a food system provides an analytical tool for identifying the component parts of food systems. Once identified, the configuration of the component parts can be compared between various food systems. The definition of sustainability provides an evaluative tool for comparing the different food systems as they relate to various resources and the decision-making capabilities of individuals and communities. The process of defining, analyzing, and evaluating food systems is an important first step in a community conversation about goals and visions for a food system.

Food Systems

Systems are complex, defined by their component parts as well as the behavior of inputs moving into, through, and out of the various component parts. Systems are interconnected both within themselves and with other systems. This holds true for food. Food does not just magically appear in grocery stores, restaurants, or on your plate. A complex system unfolds from every meal we eat back to the farm where that food was grown, back even to the seed and the soil. The term 'food system' attempts to capture the complexity of this process of getting food onto our plates, although we must immediately acknowledge that there is a multiplicity of systems by which we procure our food.

Kenneth A. Dahlberg, Professor Emeritus in the Department of Political Science at Western Michigan University, defines a food system by its components, which "include the following: (1) production processes and inputs, (2) food distribution, (3) food preparation and preservation, (4) food use and consumption, (5) the recycling and disposal of food wastes, and (6) the various support systems--which will vary by level --that are required for the viable operation of the food system" (Dahlberg, 1993, p. 81). Support systems include a wide range of material and non-materials items depending on the component or stage as well as intersections with other systems. Material items can include seeds, farm equipment, distribution centers, Universal Product Code (UPC) scanners, or compost bins. Non-material items can include research, Cooperative Extension services, and marketing strategies.

Food systems exist at the intersection of ecological systems, transportation systems, energy systems, economic systems, and cultural systems. Food systems must be conceptualized at all their various scales, from the individual scale to the global scale, because the component steps and the supporting systems are vastly different at different scales. Additionally, products do not move through the food system at the same scale throughout their journey from field to fork.

Researchers at the University of Wisconsin developed a conceptual model called "Tiers of the Food System" to express two main relationships (Bower, Doetch, & Stevenson, 2010b). First, the model reflects the relationship between food producers/aggregators/distributors and consumers. Second, the model captures the embedded nature of more localized food systems within more globalized food systems as shown in the Figure 2.1.

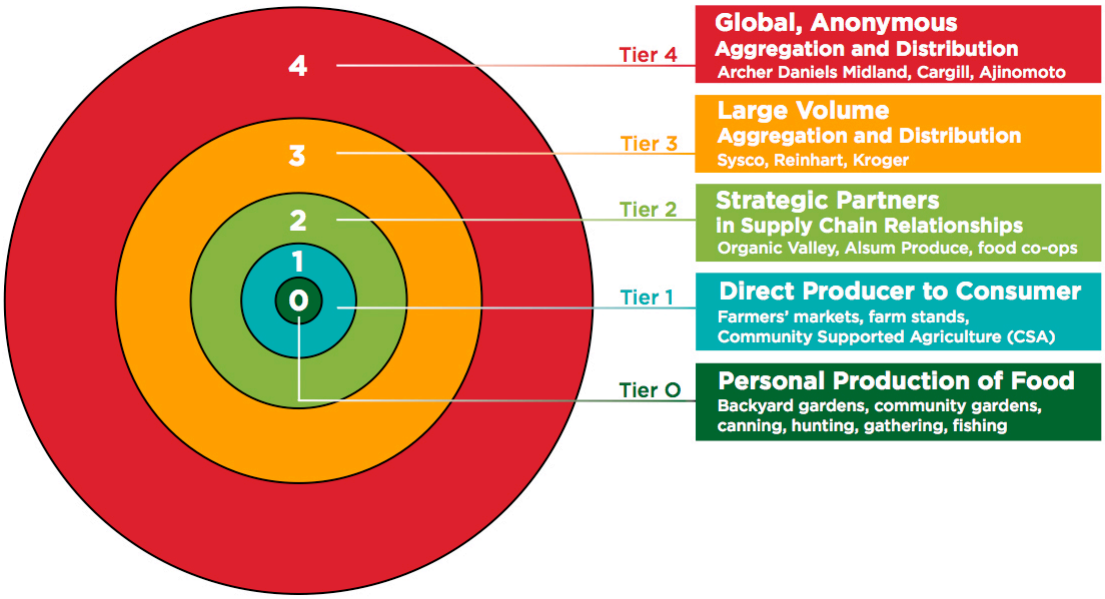


Figure 2.1: Tiers of the Food System (Bower, Doetch, & Stevenson, 2010a)

Their model has five tiers, labeled zero through four, with the smallest tier, Tier 0, representing personal food production and the largest tier, Tier 4, representing the global food production. There is an implicit recognition in this model that consumption always happens on a personal scale with the individual consumer.

Sustainability

The definition of food systems provides a framework, a descriptive tool, for differentiating various arrangements of components, support structures and systems, and scales in food systems. The concept of sustainability provides an evaluative tool for food systems. The appeal of the word is undeniable given the choice between being 'sustainable' or 'unsustainable' and seems deceptively straightforward, but the word 'sustainability' is often misused and overused as it has moved from scholarly discourse into popular public discourse. Therefore, this section will define sustainability in explicit terms and explore the concepts embedded in the definition and implications for food systems.

The definition of sustainability that I use in this thesis is as follows:

> Sustainability is a community's control and prudent use of all forms of capital—nature's capital, human capital, human-created capital, social capital, and cultural capital—to ensure, to the degree possible, that present and future generations can attain a high degree of economic security and achieve democracy while maintaining the integrity of the ecological systems upon which all life and production depends. (Viederman, 1996)

Restated, a community's decision-making capabilities about the use of their capitals with regards to its own economy, environment and society define sustainability. This places sustainability within the process of decision-making rather than as an inherent quality of any one object. Rather than having "sustainable communities," a community can make sustainable decisions about their future. These decisions can be small technical decisions about whether or not to use this particular resource in this particular way. But these small technical decisions should be part of a larger value framework and vision for the future determined by a community, which informs the smaller decisions.

Importantly, the quality and quantity of the various capitals is considered in this definition of sustainability. The capitals are not static in either their quality or quantity. The capitals can be exhausted, eroded, neglected, and exploited or they can be strengthened, renewed, respected, and well managed. If the quality and/or quantity of a capital are low, the possibilities for making sustainable decisions are diminished. If the quality and/or quantity of a capital are high, the possibilities for making sustainable decisions are increased. Therefore, if the goal is to increase the number of sustainable decisions a community can make, the quality and quantity of the capitals for a community need to be evaluated. This goal has lead scholars to identify the need for regenerative systems that increase all the capitals to increase the capacity of communities to make sustainable decisions about their own future (Dahlberg, 1993).

Describing each of the capitals in greater detail, nature's capital includes the stock and replenishment rates of renewable and non-renewable resources. Human capital includes the actual people and bodies of knowledge that contribute to community and to production. Human-created capital includes all the products and technologies created by people from roads and computers to currencies and the built environment. Social capital refers to the social interactions between members of a community and the reservoir of mutual trust, reciprocity and civic involvement. Cultural capital reflects societal means of interacting with and adapting to groups beyond our own including other human societies, non-human species, and the natural environment as a whole (Viederman, 1996).

According to Viederman, the three pillars of sustainability are economic security, ecological integrity and democracy. Economic security is the first pillar of sustainability describing the control that individuals and communities have over their own economic lives (Viederman, 1996). Economic security can be measured by the degree to which individuals and communities can shield themselves against economic shocks. An example for a individual farmer could include increasing personal savings or profitability to deal with the multiple uncertainties associated with farming (Kubil & Moore, 2003). For a community, this could include diversifying its economy so as not to be overly dependent on a single large company that can make the decision to close and/or relocate its operations at any time.

Ecological integrity is the second pillar of sustainability wherein individuals and communities make the decision to live in harmony with natural systems (Viederman, 1996). Renewable natural resources should not be used faster than their rate of replenishment. Non-renewable natural resources should be used judiciously with an eye on reducing dependency on them and replacing them with renewable natural resources. An example for a farmer could

include building organic matter in the soil while decreasing dependency on synthetic petroleum based inputs. For a community, this could include creating zoning and a robust farmland preservation strategy that limits the conversation of agricultural land into low-density developments.

Democracy is characterized by citizen participation in community decisions made through democratic processes supported by appropriate citizen education (Viederman, 1996). Diversity in all forms should be accepted and a sense of wholeness and unity should be sought through the goal of power equalization among all citizens. An example for a farmer could include participating as an active member in a grower cooperative that aggregates, packages, and distributes produce regionally. For a community, this could include creating food policy councils with the explicit purpose of soliciting input from all stakeholders in a community food system and advocating for food equity and access for all.

The Industrial Food System

In the US and most of the world, the dominant food system is an industrial one with a global reach. "Technologically sophisticated and highly standardized production techniques have penetrated most segments of the production agriculture, and advances in plant and animal science have resulted in substantial increases in production" (Lyson & Guptill, 2004, p. 370). The industrial food system excels at getting cheap and plentiful calories to our tables through efficiencies of scale, specialization, mechanization, crop monocultures, synthetic fertilizers and pesticides, cheap fuel, and government subsidies.

But some people see cracks in the industrial food systems. Our food travels an average of 1,500 miles from field to fork (Pirog, 2004). Our industrialized food system accounts for 15.7% of our nation's energy consumption (Canning, Charles, Huang, Polenske, & Waters,

2010) and with livestock production accounting for 18% of global green house gas emissions (Steinfeld et al., 2006). We have lost 80-90% of on-farm genetic diversity in the 20th century (Tuxill & Peterson, 1999), including most of the tastiest and regionally specific heirloom varieties and heritage breeds. Ecosystems are stressed as evidenced by collapsing bee (Ratnieks & Carreck, 2010) and seafood (Murawski, Methot, & Tromble, 2007) populations as well as a dead zone in the Gulf of Mexico the size of New Jersey from nutrient enrichment from fertilizer run-off (Diaz & Rosenberg, 2008). We are overfed and undernourished as a nation due to the proliferation of highly processed convenience and fast foods (Cook & Frank, 2008; Patel, 2007). Finally, there is an ever-growing threat to the security of our food supply from intentional or unintentional disruptions due to the vulnerabilities of centralized production, centralized processing, and long distribution chains (Chalk, 2004).

Today, monocultures are extremely common in industrial agriculture, although most farmers use crop rotation to prevent extensive soil nutrient depletion. The application of chemical pesticides is necessary in industrial agriculture to keep pests and diseases at bay. And, like chemical fertilizers, there is nothing inherently wrong with the majority of pesticides. Better regulations and innovations in scientific research have removed the most environmentally harmful pesticides, like DDT, from the market, the misapplication of pesticides can have unforeseen negative consequences throughout our ecosystems.

The demand for higher yields has also meant that many varieties of locally adapted crops, frequently referred to as heirloom or heritage crops, have disappeared from our plates, our farms, and our marketplaces to the point of extinction. Heirlooms are often genetically older (pre-1951 when the first hybrid crop seeds were developed), open-pollinated, and breed true. Heirlooms are often grown for particular qualities, taste being top among them. Heirlooms grown in a

particular area for generations have adapted to the climate, soil and pests of that area. This might be a boon for Georgia farmers looking for crop varieties that can deal with the hot, dry summers we are experiencing more frequently. However, these heirloom varieties are frequently not as productive, and, therefore, might not represent economically viable crops for farmers unless there is a specific niche market for the particular heirloom variety.

In 2006, farmers on average received just 19 cents of every dollar spent on food in the grocery store as shown in Figure 2.2, compared to the 41 cents they received of every dollar 100 years ago (Stewart, 2006). The 81 cents of every dollar that farmers did not receive went to labor in other sectors of the food economy (30.5¢), packaging (8¢) transportation (4¢), energy (3.5¢), profits in other sectors of the food economy (4.5¢), advertising (4¢), depreciation (3.5¢), rent (4¢), interest (2.5¢), repairs (1.5¢), business taxes (3.5¢), and other costs (3.5¢).

Figure 2.2: Percent of the Food Dollar for Farms. Source: USDA ERS, 2006 (Stewart, 2006)

Agriculture itself accounts for about one fifth of the energy used by the food system as a whole. In 2007, the food system accounted for 15.7 percent of the total United States energy budget, up from 12.2 percent in 1997 (Canning et al., 2010). As shown in Figure 2.3, agricultural production accounted for 21.4% of the total food system energy usage, processing

16.4%, packaging 6.6%, transportation 13.6%, food retail 3.7%, commercial food service 6.6%, and household storage and preparation 31.6%.

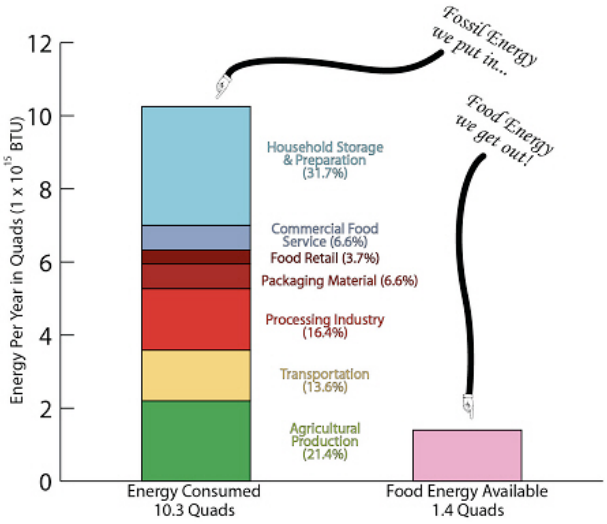


Figure 2.3: Energy in Our Food System and Our Food (Canning et al., 2010)

Using the five capitals of sustainability as a measure, the industrial commoditized food system does not score very well. Non-renewable natural resources are used indiscriminately while renewable resources are exhausted faster than they can be replenished. Specific knowledge and responsiveness to place is de-emphasized as this system leverages human capital for technological innovation and specialization for increased productive yields and lower production costs, even though it externalizes many of the social and environmental costs. Human-created capital, specifically our financial systems, reinforces the consolidation and economics of scale, both on farm and among agribusiness companies, favoring individual and corporate interests over community interests. Social capital is eroded in individual communities as there are few reciprocal relationships based on interdependence and more commoditized interactions based on dependence. Cultural capital is eroded as a sense of community and place are lost to a homogenized food culture of fast food and premade meals.

Looking to the pillars of sustainability in an industrial food system, individual communities have less control over their own economic future. Communities rarely have a voice in the decisions made around food as power and wealth are consolidated in the hands of a few. With little economy or political agency, the opportunities for communities to make sustainable decisions about their future or the protection of their environments in this configuration of the food system are low.

Alternative Food Production and Food Systems

In something as dynamic and complicated as the food system, there are many opportunities to pursue alternatives to the industrial agricultural system. Some alternatives focus solely on particular components of the food system, e.g. production. Other alternatives attempt to address the food system as a whole, seeking alternative configurations for each of the components with the food system.

This thesis addresses a group of alternative production practices, examples of which are the USDA National Organic Program, Certified Naturally Grown (CNG), and sustainable agriculture. Examining the specifics of each of these alternative production practices reveals the potential variation within a component of a food system. Production alternatives are reviewed in favor of distribution alternatives (e.g. fair trade models), consumption alternatives (e.g. veganism), or disposal alternatives (e.g. food reclamation programs) even though alternatives for each component seeks to address a range of inequities and harms within the industrial food system.

Briefly, the USDA Certified Organic system outlines more environmentally responsive production and processing standards that are effectively communicated through value-added supply chains to consumers, but scale of production, location of markets, and relationship to

larger communities are not addressed. Certified Naturally Grown (CNG) is an alternative system providing the same environmental protections though production and processing as USDA Certified Organic and has a brand, a means, for communicating value-added. But, CNG is more responsive to scale of production in recognizing production and administrative functions differ greatly between large farms and small farms. CNG also may encourage community development through peer certifying between growers in a region. CNG does not explicitly address scale beyond the farm, i.e. CNG products may be intended for larger markets beyond local, community markets.

Sustainable agriculture is defined by the USDA but does not provide a standardized set of growing practices, regulations, or certifications. Arguably, sustainable agriculture can be more responsive to local conditions and individual farm needs. However, sustainable agriculture lacks an effective means for communicating value-added to consumers.

Beyond addressing an individual component of the food system, local food systems and civic agriculture systems both attempt to provide an alternative food system to the industrial food system. Local food systems are defined by the locality and proximity to markets, but the definition of local itself is contested and poorly defined in the market place. Strictly defined, a local food system is primarily concerned with the distance food travels within the system, referred to as food miles. Local food systems do not prescribe any particular configurations or processes for the components of the food system beyond the spatial relationship between the various components. Restated, industrial processes can be reproduced in a local food system, just at a smaller scale, along with all the negative consequences. While more benefits are frequently attributed to local food systems, the only uncontested benefits of local and a shortened

supply chain are related to the economic benefits of keeping money within a defined area through import substitution (Bellows & Hamm, 2001).

Civic agricultural as a system attempts to provide a more comprehensive alternative to the dominant industrial food system (Lyson, 2004). It explicitly embeds all components of a food system with a community context and at a community scale. It proscribes processes for each component within a food system to be in accordance with the individual needs of the farmer, the local ecology, the local economy, and community values.

USDA National Organic Program.

It is difficult to trace the beginning of the organic food movement because it represents the main form of agricultural production for all of human history with the exception of the last 60 or 70 years. Sir Albert Howard, considered the father of the modern organic agriculture, observed traditional forms of agricultural production in India, noting synergistic benefits working in accordance with nature and reliance on natural organic matter and healthy soils (A. Howard, 1940). Howard advocated for organic farming methods over the growing conventional methods of scientific farming practices using synthetic chemical inputs. The legacy of his advocacy is apparent in the mainstream understandings that organic food is grown without synthetic chemicals.

In the United States during the 1960s and 1970s, the organic movement was seen as a lifestyle movement encompassing the three pillars of sustainability through environmentally friendly agricultural practices that provided an economic return for the greater social health of communities. As consumer interest in organic grew, so did the need for a third party agent to certify that what was being sold meet the environmental standards of being produced without any synthetic chemicals. Non-profits, cooperatives, and state governments rose the occasion,

developing the states specific certification standards or third party certifications. By 1990, "at-least twenty-two state laws were on the books," but "certifiers did not recognized one another's standards" (Fromartz, 2006, p. 195).

Responding to the demands of organic farmers and organic agribusiness companies seeking to legitimize and expand their market, the Organic Foods Production Act (OFPA) of 1990, proposed by Senator Patrick Leahy of Vermont, created the USDA National Organic Program to establish national uniform standards. The final version of the standards was published in 2000 and enacted April 21, 2001. These standards limit the use of farm inputs derived from synthetic products, recommend certain production practices, and outline the process for certified farms. The standards also address the percentage of organic ingredients in processed foods that can be labeled as USDA Certified Organic. The standards and certificate create a value-added supply chain that communicates information about production and processing of food to consumers. Importantly, items not *certified* through the USDA cannot use the term "organic" as a descriptor, even if the items meet the NOP standards and regulations.

The organic food industry has seen tremendous growth with organic grocery sales since 2001, averaging an increase of 20% in sales figures every year (Brady, 2006; Cantor & Strochlic, 2009; Dimitri & Greene, 2002; Fromartz, 2006). But with market growth and scaling up to national and international distribution, many see conflict in the original ideals of the organic food movement and its current commodification. In 2007, there were 20,437 farms and 2,577,418 acres in the NOP. This was a 181.7% increase in the number of certified farms and a 358.2% increase in the number of certified acres. The total value of certified organic products in 2007 was over $1.7 billion. Georgia saw even more substantial gains in the number of USDA Certified Organics farms from 2002 to 2007. In 2007, 157 Georgia farms and 2015 acres were

certified organic, up 460.7% and 464.4% respectively from 2002. The value of certified organic products in Georgia in 2007 was over $2 million (NASS, 2009b).

However, as the organic food movement has grown by leaps and bounds, the original organic movement's concern with a sustainable, comprehensive lifestyle has largely "co-opted" by a set of industrial principles that reduce the organic movement to production standards. Laura DeLind, anthropologist and founding member of the Michigan Organic Food and Farming Alliance, writes, "Organic production and distribution are being transformed into a large-scale, long distance, and often monocultural industry. And the original attention paid to scale and context, to sufficiency and particularity, has largely been overridden as organic products and market replace flexible sets of ecologically sensitive processes and an associated way of life" (DeLind, 2002, p. 123). The decontextualization of organic food, as it moves through industrial supply chains, has undermined many of the benefits it sought to provide.

Meeting consumer demand, the largest the organic farms and firms scale up by employing the logic of industrialization to their operations. For consumers, the USDA Certified Organic seal primarily communicates information about the lack of certain synthetic inputs in the production of their food and percentage of USDA Certified ingredients in their prepared foods. The USDA Certified Organic seal cannot effectively communicate the range of production practices permitting under the NOP nor where the food was grown, by whom or at what scale of production. For example, a USDA Certified Organic carrot can be grown in soil enriched with compost produced on farm that uses organic matter from complimentary livestock operation, controls weeds by hand, and pays a living wage to workers from the community; or a USDA Certified Organic carrot can be grown on a farm that uses in plastic mulch, fish emulsion fertilizer (a by-productive of indiscriminate and destructive fishing practices), controls weeds via

flamethrower, and pays seasonal migrant farm workers minimum wage (or less). The strengthen of the USDA Certified Organic brand is dependent on consumer knowledge about what organic production means and faith that the USDA polices producers and companies using the USDA Certified Organic brand.

Using the five capitals of sustainability as a measure, the NOP explicitly seeks to increase natural capital on farm through decreasing dependence on inputs derived from non-ecologically compatible and non-renewable resources. This increasing natural capital corresponds to an increase in human capital as individual farmers respond to the specific ecology of their farms. The scope of the organic standards is limited to the range of agricultural practices on the farm, some food processing (percentage of organic ingredients and limited food additives), and marketing products. The narrowly focused purpose of USDA National Organic Program permits it to move through industrial channels without challenging the status quo of the industrial system. Social capital remains low as few reciprocal relationships are encouraged between communities of growers or between producers and consumers. Cultural capital is slightly increased as individual consumers enact their values through food purchases and support of organic food. However, wider communities are not encouraged to share these values through wider dialogues.

Looking to the pillars of sustainability under the NOP, organic agriculture creates choices for individual farmers to grow in a more ecologically sensitive manner while increasing their personal economic security by capturing a premium through the USDA Certified Organic seal that maintains a viable value-added supply chain from farm to consumer. Consumers have more ecologically sensitive choices when making food-purchasing decisions. However, in both the case of the farmer and the consumer, individual choice is emphasized over democratic decision

making processes. In addition, the corporatization of the organic industry replicated the consolidation of power and wealth in the hands of a few working against the goal of social equity in the system (Fromartz, 2006; Pollan, 2006). Overall, increased opportunities to make decisions regarding ecological health on the individual level increased the opportunities for sustainability.

Certified Naturally Grown.

The power of the National Organic Program (NOP) is that it represents a single set of standards applied uniformly, certified by a third party (NOP) who also enforces marketing and brand integrity. However, agriculture is not one size. As discussed in the first chapter, a dual structure of agriculture has developed with large commodity production agriculture on one side and small-scale value-added niche production agriculture on the other side. The NOP was thoughtfully developed but with eye to certified larger production farms. The certification process is administratively and financially burdensome for smaller farms, especially those small farms with larger crop diversity. For example, a large farm growing 50 acres of a single varietal of tomatoes only has to make a record for that one crop documentation while a very small 5 acre farm growing 10 heirloom varieties of tomatoes and 4 heirloom varieties of 10 other crops has to make a record for 50 different plants. There are also fixed costs for certification that have a larger impact on smaller operations.

Without the NOP certification, a grower cannot use the term organic to market their product even if they follow the NOP standards to the letter and have been following the standards since before the creation of the standards. The farmer is legally restricted from using the value-added term most familiar to customers. An extra burden then falls to the farmer to find alternative methods for communicating the value-added qualities of his/her products.

It is in this context that Certified Naturally Grown (CNG) was established in 2002. CNG follows "the USDA standards of the National Organic Program, but the record keeping and inspection process is tailored to accommodate the needs of small-scale mixed-agriculture farmers, and are not normally permitted to use the word 'organic'" (CNG, 2011). CNG uses a "Participatory Guarantee System" for certification, which is a peer-review system of certification where a CNG farmer can become a CNG inspector. Paperwork and written documentation are kept to a minimum in favor of farm inspections by peer inspectors. Inspection forms and certification are posted online for full public access adding transparency to the certification (CNG, 2011). CNG does not explicitly address locality like it addresses scale. Many smaller scale farmers participating in CNG are dependent on local markets, but this is not always the case. Most importantly, CNG provides a method for maintaining value-added supply chains, removing the need for third party audits from the farmer. However, like with the USDA Certified Organic seal, consumer trust in the brand is paramount. With fewer resources and more informal networks than the USDA, the CNG brand faces increased risks from individual farmers skirting the rules and undermining the integrity of the brand.

CNG is equivalent to the NOP in building natural capital and increasing human capital that is responsive to ecological systems on farm. CNG goes further than NOP in building human capital and social capital through the Participatory Guarantee System, increasing the individual capacity of farmers to be the inspectors and creating reciprocal relationships between farming peers within a community. CNG and the NOP are similar in regards to cultural capital.

CNG, like the NOP, provides economic opportunities through ecologically sensitive farming practices, increasing the possibility for individual farmers to choose to grow and market their crops to CNG/NOP standards. Unlike the NOP, CNG increases the potential for democratic

decision-making through transparency of the inspection and certification process as well as empowering a community of growers to certify themselves and hold themselves accountable to agreed upon standards. Therefore, CNG arguably increases more capitals and the decision-making capabilities of community to choose sustainability.

Sustainable Agriculture.

Congress defined "sustainable agriculture" in the Food, Agriculture, Conservation, and Trade Act of 1990, also known as the 1990 Farm Bill. This definition reads:

> "The term sustainable agriculture means an integrated system of plant and animal production practices having a site-specific application that will, over the long term: (a) satisfy human food and fiber needs, (b) enhance environmental quality and the natural resource base upon which the agricultural economy depends, (c) make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls, (d) sustain the economic viability of farm operations, and (e) enhance the quality of life for farmers and society as a whole." (Congress, 1990)

The definition of sustainable agriculture, much like the definition of sustainability in this thesis, reflects a wider range of activities and decisions to be made by individual farmers than any specific set of rules or standards. Sustainable agriculture could be considered to be an umbrella term for a range of ecologically sensitive growing practices, under which many people place organic agricultural production.

Yet, there is not perfect alignment between sustainable agriculture and the NOP. Going back to the example of the two USDA Certified Organic carrots, the carrot grown using compost produced on-farm represents the principles of sustainable agriculture while the carrot grown in

plastic mulch with fish emulsion does not represent the principles of sustainable agriculture. Conversely, there are situations when the minimal and judicious use of synthetic pesticides means the difference between losing certification or losing the farm. The long-term economic viability of the farm, the fourth principle of sustainable agriculture, would not be served if the farm were lost. In this way, sustainable agriculture is more responsive to locality and community than organic agriculture because production decisions are based on a farmer's discretion weighing out opinions that are best for his/her farm in the context of the farm's economy, ecology, and relationships.

A drawback to sustainable agriculture is that it is difficult to communicate within consumer markets. Sustainable agriculture is a process rather than a defined set of traits. Whether a practice could be considered a sustainable agricultural practice is dependent on the ecological, social, and economic environment in which it is practiced. The task of communicating the value of sustainable agriculture requires more time and resources in the marketplace.

The use of sustainable agriculture as a standard for sustainability in the food system at large might seem obvious, but sustainable agriculture's focus only on the production component of the food system and the lack of specific standards leaves room for improvement (Dahlberg, 1993). Sustainable agriculture explicitly addresses building natural and human capital. Unlike the NOP and CNG, sustainable agriculture outlines a vision for interactions between agricultural production, the environment, and society thereby increasing cultural capital. Additionally, sustainable agriculture enhances human-created capital by encouraging on-going discussions about the appropriateness of particular technologies to solve particular problems, because it does not necessarily remove particular technologies from consideration. However, sustainable

agriculture does not address the reciprocity in relationships, interdependence, and social capital between farmers and society.

Local food systems.

Local food systems are defined by their locality and proximity to markets. Consumers easily understand the concept, but the definition of local itself is contested and poorly defined in the market place. The most generous use of the term local comes from the Value-Added Agricultural Marketing Development (VAAMD) Program administered by the USDA Office of Rural Development which "defines the total distance that a product can be transported and still be eligible for marketing as 'locally or regionally produced agricultural food product' as less than 400 miles from its origin, or the State in which it is produced" (Martinez et al., 2010, p. 3). This parallels the distribution industry standard of defining local foods as those from within a particular state and all adjacent states.

Other definitions of local are popularized by best-selling authors choosing to "eat local" for a given amount of time, typically a year. Gary Nabhan (2002) defined local in "Coming Home to Eat: The Pleasures and Politics of Local Foods" to be 250 miles of his home in the deserts of Arizona. Barbara Kingsolver (2007) and her family decided to ditch Arizona for Appalachia to eat local and homegrown for a year in "Animal, Vegetable, Miracle: A year in food life" although Kingsolver eschews a strict definition that constitutes local. The year before the Kingsolver family moved, Michael Pollan visited farmer and local food advocate, Joel Salatin, to taste a steak that Salatin refused to ship to Pollan. Pollan (2006) wrote about Salatin's commonsense definition of local being a day's drive from the farm and about the meal in "Omnivore's Dilemma: A natural history of four meals." The most often cited mileage

demarcation of local comes from Smith and MacKinnon (2007) in their book, "The 100 Mile Diet: A Year of Local Eating," which is pretty self-explanatory and explains the mass appeal.

Figure 2.4 shows the differential geographic definitions of local food based on what would be considered local to a resident of Athens-Clarke County. The largest purple circle represents a 400-mile radius as the crow flies[7] from Athens reflecting the USDA VAAMD definition. Theoretically, food grown in 10 different states would be local to Athens under the VAAMD definition. The five green states and Georgia (in orange) represent the definition used by most large distribution companies. For many people, food grown within a state constitutes locally grown, which in this case would be Georgia. The blue circle represents a 100-mile radius as the crow flies from Athens. This popular definition of local food would include produce from Georgia, North Carolina and South Carolina, but not South Georgia, which is the commodity vegetable belt in Georgia. The irregular red shape denotes all the counties the farmers participating in the 2010 season of the Athens Farmers Market live in. It is not surprising that consumers, when surveyed, cannot agree on how far local food might travel (Durham, King, & Roheim, 2009).

[7] A more accurate picture of a 400 road miles from Athens would cover a smaller area as there are no roads that extend in a perfectly straight line from Athens.

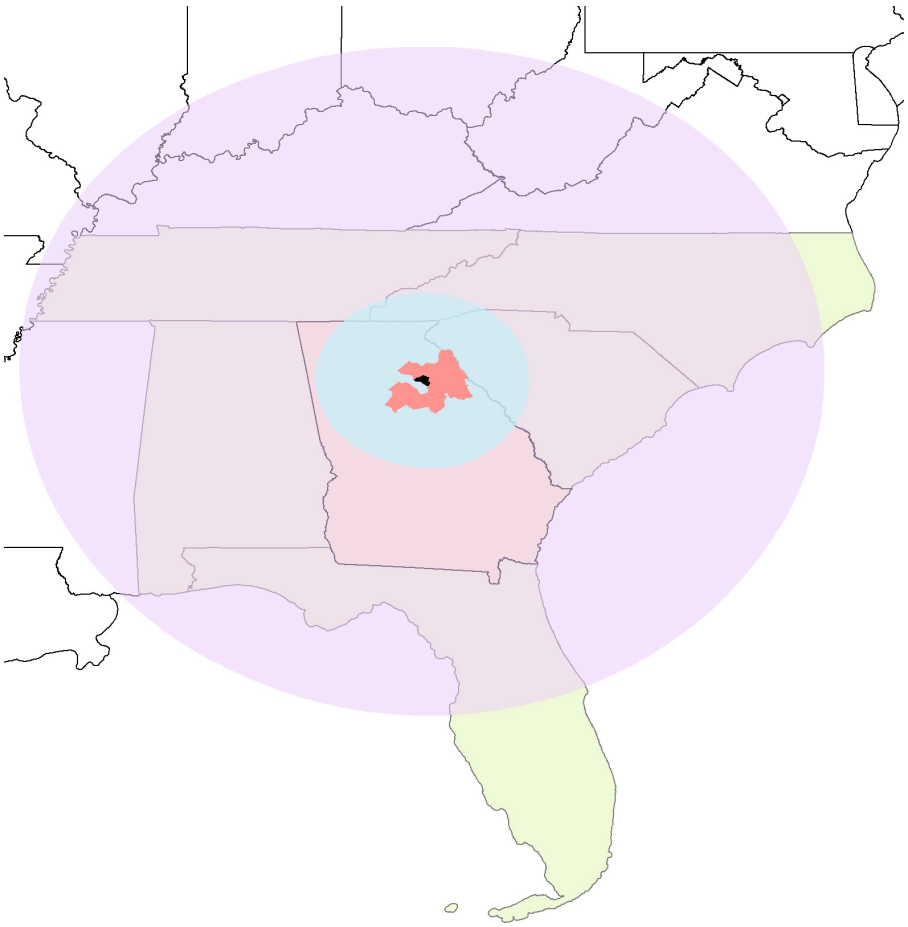


Figure 2.4: Geographies of Various Local Food Definitions.

Lacking other means of calculating the impact of local food, the USDA uses direct farm-to-consumer sales to measure the economic impact of local food systems. In 1997, 116,733 farms in the United States had $1.045 billion in direct farm sales, adjusted for inflation to 2007 US dollar value. A decade later in 2007, the number of farms with direct farm sales increased 17.21% to 136,817 farms with a 15.85% increase in sales at over $1.211 billion. In Georgia in 1997, 1755 farms had $10.3 million in direct farm sales, adjusted for inflation to 2007 US dollar value. In 2007, the number of direct sale farms increased by 7.69% to 1890 farms with a 27.68% increase in sales at over $13.1 million. Of this $13.1 million, $7 million came from direct fruit/nut and vegetable sales.

Advocates hope that local food systems, in addition, to being "rooted in particular places, aim to remain economically viable for farmers and consumers, use ecologically sound production and distribution practices and enhance social equity and democracy for all members of the community" (Feenstra, 1997, p. 28). However, this has lead scholars to issue a warning to local food advocates to avoid "the local trap" (Born & Purcell, 2006). The "local trap" results from prescribing values to scalar qualities of food systems, i.e. assuming more globalized food systems are bad and more localized food systems are good (Born & Purcell, 2006; Campbell, 2004; Kneafsey, 2010).

Historian James E. McWilliams also challenges the false dichotomies of local/good, global/bad and expands on the faulty assumptions associated with local food in his book, "Just Food: Where Locavores Get it Wrong and How We Can Truly Eat Responsibly" (2009). McWilliams challenges the assumption that shorter supply chains alone are more environmentally friendly than industrial supply chains. He points to life cycle assessments as better analytical tool in determining the environmental impact of our food than simply considering food miles as a measure. This is important to keep in mind as transportation accounts for just 13% of energy in our current food system. For example, greenhouses used to grow food locally off-season can use more energy and emit more greenhouses gases than food transported in from farther away where the crop is in season. Another example McWilliams uses involves economies of scale in transportation where the total amount being transported must be divided by total amount of fuel used for transportation. So, 2,000 pounds of tomatoes transported 2,000 miles using 200 gallons of fuel is equivalent to 10 pounds of tomatoes transported 10 miles using 1 gallon of fuel.

When evaluating local food systems, this thesis is going to restrict the definition of local food systems to the distance that food travels from farm to consumer. This strict definition anticipates a time when the USDA takes a stronger interest in defining "local" food beyond the current 400-mile definition used by VAAMD. The distance food travels does not prescribe any agricultural practices, place any restrictions on production, or promote any set of ideals like the NOP, CNG, and sustainable agriculture due to differing degrees. Food miles do not necessarily translate into increased environmental benefits over industrial food systems, though the opportunity for reduced environmental impact is present. The major benefits of local food systems are economic benefits due to the linkages within a food system. In Georgia for instance, the "direct sales of over $7 million involved a total of 132 jobs, $4.5 million in labor income, $6.4 million in value-added, and $14.4 million in output in the Georgia economy" (Kane et al., 2010, p. 2).

Local food systems increase economic opportunity for growers within a specific region by creating a value-added out of a shortened supply chain. However, local food is not result in de facto environmental benefits nor does it always encourage consumers to engage in relationships beyond simple consumption. In total, a community's decision-making capabilities around its economy, environment and democratic processes in a local food system are greater than in an industrial food system but not necessarily better or worse than an organic or sustainable agriculture system.

Civic agriculture.

Civic agriculture tries to address the shortcomings in the other alternative agricultural systems by implicitly embedded sustainable agricultural practices in a community context. This provides appropriate scale, sensitivity to place, and civic engagement within the food system.

Rural sociologist, Thomas Lyson, helped coin the term "civic agriculture" and expands on this definition adding:

> "[Civic agriculture is] a locally organized system of agriculture and food production characterized by networks of producers who are bound together by place. Civic agriculture embodies a commitment to developing and strengthening an economically, environmentally, and socially sustainable system of agriculture and food production that relies on local resources and serves local markets and consumers. The imperative to earn a profit is filtered through a set of cooperative and mutually supporting social relations. Community problem solving rather than individual competition is the foundation of civic agriculture" (Lyson, 2004, pp. 63-64).

Restated, civic agriculture takes the hopes that local food advocates place on locally-grown food (i.e. ecological sensitivity, social equity, and economic feasibility) and explicitly includes these hopes in the definitions of civic agriculture.

Civic agriculture builds from the simple recognition that it is "[t]he immobility of farm land and the inter-generational employment patterns among farmers [which] continue to provide the infrastructure, the material reality that is the pre-requisite for community" (Lind, 2003, p. 84). In a commitment to land, a sense of place can thrive. The more people commit to the land through the long investment of agriculture, the more opportunities there are for an independent middle class of farmers and small business owners with dispersed economic and political power. This is an updated version of the Jeffersonian agrarian ideal (Kemmis, 1990; Lind, 2003; Lyson, 2004).

The boundaries of civic agriculture are fuzzy and process driven rather than practice driven. However, the interdependent and reciprocal relationships encouraged in civic agriculture

are experienced. These relationships mirror the relationship built in direct sale markets, where consumers personally know their farmers, and become the value-added.

Civic agriculture deliberately seeks to increase all the capitals in a community. Natural capital increases as farms mimic ecosystems and locally source renewable inputs. Human capital increases as people develop holistic knowledge specific to their region rather than specialized knowledge that can be applied anywhere. Human created capital is scaled to community, reflecting the needs and wants of a community. Social capital is built through reciprocal relationships of interdependence and trust. Cultural capital expands as commitment to place leads to a sense of place shared by members of community who become invested in a common vision for that place.

As all these capitals grow, economic security is strengthened, ecologic integrity is improved, and democracy proliferates. The opportunities to make sustainable decisions are greater than in other agricultural systems.

Conclusion.

The industrial food system is unlikely to be replaced completely by an alternative food system any time in the near future. This does not mean, however, that the problems associated with the industrial food system should not be addressed or than alternative systems should not be explored. It is important for communities understand the complexity of the food system and the opportunities for alternative components and for alternative food systems before engaging in broader public discussions about the future of food and agriculture.

Alternative food systems attempt to address concerns about the industrial food system through more ecologically sensitive growing practices, shorter distribution chains, and/or building reciprocal community relationships. A better understanding of the various components

and configurations of food systems permits all stakeholders (i.e. farmers, consumers, elected officials and policy makers) to communicate clearly with one another about where specific concerns lay and where opportunities for change are possible.

It is equally important to have goals and evaluative tools for food systems and in planning processes. Sustainability, defined by the quality and quantity of the five capitals and the decision-making capabilities of a community around economic security, ecological integrity, and democracy, provides both. The goal is to increase the ability of communities to make decisions about their community rather than decisions being made for them or enforced on them. The evaluative tools are the quality and quantity of the capitals in a community. These issues are addressed again in Chapter 6.

CHAPTER 3

FOOD SYSTEMS AND THE PLANNING PROFESSION

A Call for Professional Attention

In her book, "Hungry City," Carolyn Steel (2009) sees cities through the lens of food. Steel captures the enormity of the task by which we are fed each and every day – which is to say, she writes about the complexity of the food system, both in a historical context and in its current industrial configuration. Trained as an architect, Steel argues that food has shaped our cities as significantly as architecture, transportation and economics. Despite Steel's bold and convincing argument, planners have been slow to acknowledge the relationship of food to cities.

Steel is not the first writer to address this issue. The first and most comprehensive examination of agriculture from a planning perspective came from Ebenezer Howard (E. Howard, 1945) and the Garden City Movement. Working at the turn of the 19th century, Howard envisioned a utopian city that would improve the quality of life for all residents. Howard saw the in-migration of rural residents from farmland to the cities as resulting from a shift in the economics of agriculture. The most productive agriculture land in the United Kingdom was subject to increased land rent due to its abundant fertility. This decreased the profit margins for the farmers working the land. Farmers there also had to compete with farmers outside of the country for grains and other less perishable food items. When faced with a disappointing harvest due to weather or pests, a farmer could not recuperate his investment at the beginning of the season and he and his family moved to the city.

Howard addresses the economics of agriculture in his garden cities through alternative land ownership models, making an agrarian lifestyle economically feasible for those interested in an agrarian lifestyle. Howard also saw agriculture as a working landscape that could actively function as open space and address environmental concerns. The Garden City Movement inspired many cities in the United Kingdom, United States, and British colonial towns.

Almost a century passed before the planning profession began considering its role in addressing the food system. This professional lapse was identified by Pothukuchi and Kaufman in their article "The Food System: A stranger to the planning field" (Pothukuchi & Kaufman, 2000). They point out that the planning profession is distinguished by its comprehensiveness in scope and appreciation of the complexity and interconnectedness of functional systems in communities. Beyond the traditional areas of land use, housing, and transportation planning, planners increasingly take on issues related to public health, educational services, and energy use. It seems that food systems, which influence and are influenced by land use, economic development, public health, sense of place, etc., would fit well within the field of planning.

Pothukuchi and Kaufman specifically ask three main questions in their work: (1) why is so little professional planning attention paid to food systems, (2) should more attention be paid to food systems, and (3) what could the role of a planner be related to food systems. They surveyed the senior planning official in 22 planning department from cities with active food policy councils or organizations actively addressing food systems issues in an effort to answer the first question. Several respondents felt that their involvement with food systems was limited to zoning only and the rest of the food system was handled by private interests or social service agencies, especially when their planning departments were not funded to work on food systems. Other respondents felt that food issues are rural issues not urban issues or that they do not know

enough about the food system to contribute. Some questioned why they should address a problem they do not see as existing. In response, Pothukuchi and Kaufman offer reasons why planners should care about food systems. All of the examples they provide emphasis the impact food systems have on urban environments.

Finally, Pothukuchi and Kaufman recommend five roles that planners can play in food systems. First, planners can compile data on a community's food system and using these data to describe the food system in broad-brush strokes around employment, health, economy, and access. Part of this description could include inventorying activities in the conventional food system, the emergency food system, and alternative food system. Second, planners can analyze the connection between the food system and other systems. Third, understanding this connection could help planners assess the impact that planning decisions have on local food systems, whether their actions encourage or inhibit local food systems. Fourth, within the public planning process, planners could engage communities in dialogue and remind them to include food system issues in a community's comprehensive planning goals. Finally, they recommend that planning schools "need to incorporate more systemic training on food systems planning and even offer specializations on the topic" (Pothukuchi & Kaufman, 2000, p. 121).

Answering the Call

The American Planning Association (APA) is a national non-profit organization "organized exclusively for charitable, educational, literary and scientific purposes to advance the art and science of planning and the activity of planning — physical, economic, and social — at the local, regional, state and national levels" (APA, 2011a). It is the largest professional planning organization in the United States with 40,000 national members, 40% of whom are certified planners. As an organization, APA develops policy guides for a range of topics that

"articulate specific policies that establish principles for better addressing issues" and develops "guidelines that recommend specific actions on the part of APA members through leadership, chapters, divisions, and allied organizations that move toward an improved social and political environment for planning to play its most effective role" (APA, 2011b). Policy guides typically reflect legislative priorities for APA and its members.

In response to member interest in the field of food system planning, APA adopted the "Policy Guide on Community and Regional Food Planning" (APA, 2007) to go along with the 22 other adopted policy guides. This policy guide uses many of the same arguments and justifications found in Pothukuchi and Kaufman's article as justification for professional consideration of food system planning within the field of planning[8]. Significantly, the policy guide articulates the professional goals for planners regarding food systems, which are to "(1) help build stronger, sustainable, and more self-reliant community and regional food systems, and, (2) suggest ways the industrial food system may interact with communities and regions to enhance benefits such as economic vitality, public health, ecological sustainability, social equity, and cultural diversity" (APA, 2007, p. 2).

The policy guide offers 26 specific policy recommendations, each with justification and examples of how planners can support the recommendation. These 26 recommendations are grouped into seven general recommendations. These recommendations cover planning for food systems in (1) the comprehensive and public planning process, (2) strengthening regional economic development, (3) improving community and public health, (4) promoting ecological sustainability, (5) ensuring social equity, (6) preserving traditional food traditions and cultures,

[8] Pothukuchi and Kaufman were co-authors of the APA's "Policy Guide on Community and Regional Food Planning."

especially for Native American and minority cultures, and (7) supporting state and national legislative affecting the food system.

Increasingly, municipalities and states are creating or partnering with food policy councils (FPC). Because food exists at the intersections of the built environment, ecology, community and economic development, education, public health, sense of place, and community identity, FPCs can bring together various community stakeholders to examine these intersections and their impacts in order to recommend policies and actions to improve the food system for everyone. Stakeholders include elected officials, educators, health professionals, planners, anti-hunger advocates, local food activists, and others.

As a first step, many FPCs compile a community food assessments (CFA) or conduct food system surveys to better understand the food system for their community. A CFA focuses on describing human interactions with the food system with an eye to public health and equity, especially food access issues in the community. A common goal of CFAs is to identify food deserts within a community. Food deserts exist when structural issues (i.e. lack of personal transportation, distance to food retailers, and lack of financial resources) prevent individuals from having regular access to fresh, high quality, minimally processed foods. CFAs identify gaps within a community left by the industrial food system and frequently propose building local food systems to fill these gaps. The emphasis on the individual food consumer within CFAs means that CFAs are flexible tools that can be easily scaled to areas of various sizes from individual neighborhoods to entire metropolitan areas. However, CFAs do not focus on identifying were the majority of food entering a community originates from.

A food system survey, on the other hand, emphasizes the components and configuration of the whole food system. Food system surveys are broken into sections corresponding to the

components in a food system, describing production, distribution, processing and retailing, and consumption habits. Food system surveys recognize that the geographic footprints of food systems, especially production, often happen outside of the smaller jurisdictional limits of cities. Food system studies are more explicit about identifying where food is produced, inside or outside the study area, and how much food is transported into and out of the study area. For example, the Delaware Valley Regional Planning Commission (DVRPC), in compiling the "Greater Philadelphia Food System Study" (2010), analyzes the region in a 100-mile radius from downtown Philadelphia to explore the regional food system.

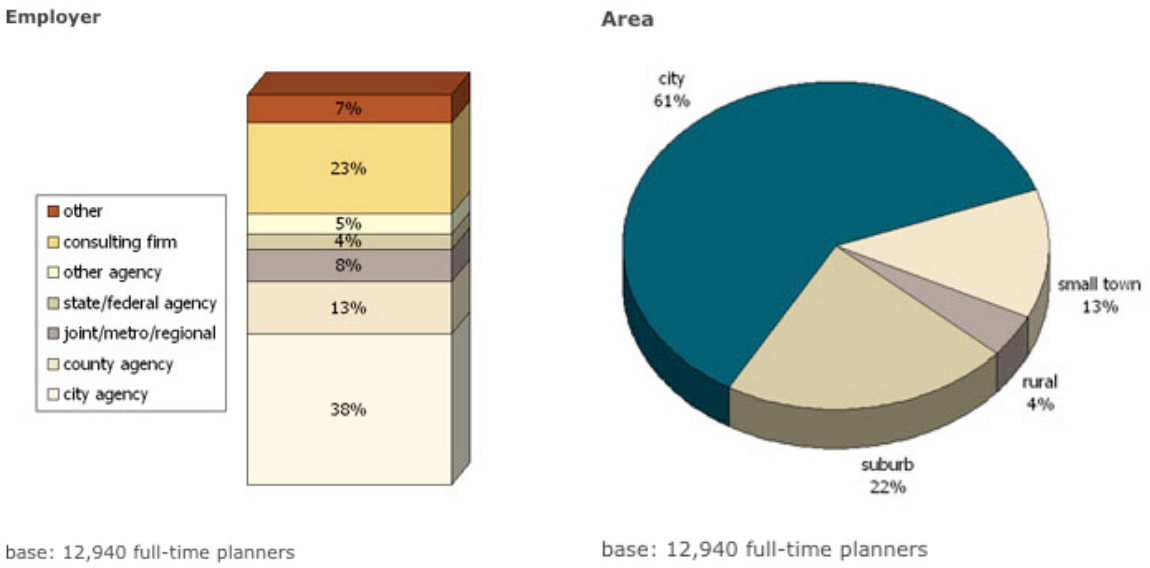
Once a community food assessment and/or food system survey is completed, FPCs can begin making recommendations to improve the food systems within their defined target area.

Barriers in rural food system planning

There is a difference between urban areas and rural areas, especially with regard to food system planning. Urban and rural areas have different characteristics, different problems, different opportunities, and different resources to address these problems and needs. There is a general bias in the planning profession to urban areas where the majority of planning professional are employed. This urban bias emphasizes urban consumers when studying food systems and recommending policies for effecting food systems, even though the majority of our food is grown in rural environments.

In a survey of 12,490 full-time planners in 2010, APA shows that 70% of planners work in public agencies and within this public sphere 38% of planners work for city planning agencies and 13% of planners work for county governments. Twenty eight percent of planners work for jurisdictions with populations of 250,000 or more while the median public agency planner works for a jurisdiction of 85,400 people. Sixty one percent of planners report their principle

employment is in a city, followed by 22% in a suburb, 13% in a small town, and just 4% working in a rural area (APA, 2011c).



Figures 3.1 and 3.2: Survey of Full-Time Planning Profession by Employer (3.1 on left) and by Area (3.2 on right). Source: APA Employment Characteristics, (APA, 2011c)

Typically, public planning agencies are responsible for a range of planning activities including land use planning, code enforcement, comprehensive planning, community and economic development planning, transportation planning, natural resource planning, housing, and historic preservation. Like all public agencies, public planning agencies are dependent on tax revenue for their continued operation. Urban areas typically have higher tax revenue than rural areas, allowing them to hire a planning staff large enough to tackle complex projects comprehensively. Rural areas, in contrast, have lower tax revenue to the point that there is often only one planning professional who is responsible for all planning functions, or there is no planning professional at all. This lone planner must prioritize the various planning functions to meet the needs of the community he/she is serving. If there is no planning professional, regional planners or private planning firms come in to the community from the outside to perform

minimum planning functions. After the top priorities are addressed, there often are not enough resources left to address the remaining planning functions.

In jurisdictions without planning agencies of their own, regional planning agencies step in to help communities do the minimum level of required planning. Often though, these regional planning agencies are themselves constrained by limited resources that must be spread out over multiple jurisdictions. As an emerging field within planning, food system planning is currently seen as a low priority, and, when constraints exist, it is often overlooked entirely.

As a result, food system planning tends to occur most often in urban areas, situated in an urban context and oriented to the urban populations they serve. This urban context affects the policy lens through which the food system is evaluated. Food system policies recommended in an urban context emphasize public health, food access, social equity, permitting small-scale production in individual gardens, community gardens, urban farms, enterprise development, containing suburban sprawl, and preserving existing farmland. If food system planning were to happen instead in a rural context, policy recommendations might emphasize economic development, incentives for farming and associated, appropriately scaled infrastructure, conservation use and resource management.

CHAPTER 4

METHODOLOGY FOR IDENTIFYING POTENTIAL FOOD HUBS

As discussed in Chapter 1, regional food hubs represent infrastructure scaled to meet the needs of mid-sized farms, those that exist in the threatened agriculture of the middle. The working definition of a regional food hub used by the USDA is "a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products" (Bragg & Barham, 2010, p. 3). The core components of regional food hubs are aggregation, coordination, and infrastructure as illustrated in Figure 4.1. The aggregation of product gives a single drop point for multiple farms and a single pick up point for a distributor. Aggregation from multiple farms creates a volume of produce that individual farms are unable to achieve on their own. This is especially important when selling to grocers and institutions. Active coordination is required between farmers and buyers to match supply to demand and ensuring that farms meet food handling and safety requirements. The minimum infrastructure required is the presence of one or more facilities where products can be aggregated and distributed from (Bragg & Barham, 2010).

The USDA recognizes that the current working definition of regional food hubs allows for a wide range of activities that could be considered food hubs. Food hubs can be retail-driven, non-profit driven, producer-driven, or consumer-driven. Food hubs can simply be a single point for shipping or they can provide a range of additional services like value-added processing, technical assistance, farmer mentoring, brand certification and management, and food distribution.

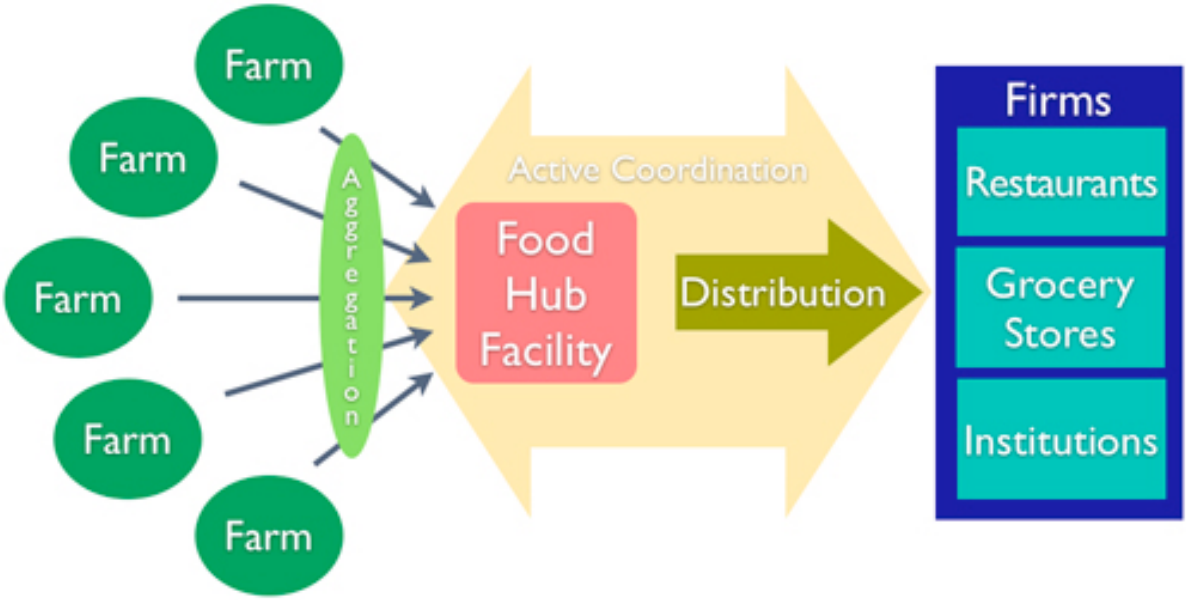


Figure 4.1: Food Hub Model. The key characteristics are (1) aggregation from multiple farms, (2) active coordination between buyers and suppliers, and (3) facilities where products can be aggregated and distributed from.

Food hubs can distribute locally grown food using any production method along with other non-local goods (more likely through retail-driven and consumer-driven models) or they can distribute locally grown food alone with products grown with specific growing practices (more likely through non-profit and producer-driven models) (Bragg & Barham, 2010; Day-Farnsworth, McCown, Miller, & Pfeiffer, 2009; Flaccavento, 2009).

Under the USDA's Know Your Farmer, Know Your Food Initiative, the Regional Food Hub Subcommittee calls for identifying existing, emerging and potential food hubs across the country (Bragg & Barham, 2010). It is easy to identify existing food hubs. It is more difficult to identify potential food hubs. To find potential food hubs, I take knowledge about existing food hubs as well as farms engaged in direct-to-consumer sales and develop a methodology for identifying criteria and indicators that can be used to find potential food hubs with national implication. The criteria derived from existing data are (1) proximity to markets, (2) efficient

distribution networks, (3) low development pressure, (4) good soils, (5) existing farmland, (6) farms already oriented to direct sale markets, and (7) a critical mass of farmland. For each of these criteria, indicators are identified and analyzed using Geographic Information System (GIS) to spatially map out regions suitable for establishing food hubs.

Developing Criteria

Proximity to Markets.

Conceptually, proximity to markets is a defining feature of locally grown food. The closer food is grown to consumers, the less distance it travels from farm to consumer and the more local it can be considered. Decreased food miles represent the value-added for locally grown food. Data from the last four Census of Agriculture reports (1992, 1997, 2002, and 2007) support this conceptual definition. Summarizing these findings for the 2007 Census of Agriculture, Martinez and co-authors write:

> Access to urban markets is crucial to farms engaged in direct sales. There were 71,400 direct sales farms located in metro counties and 44,100 were located in rural counties adjacent to metro counties. Together, these farms accounted for 84 percent of all farms engaged in direct sales. Farms in metro areas and adjacent areas earned nearly $1.1 billion from direct sales to consumers--or 89 percent of all direct sale incomes. Direct sales per farm decreased for farms located progressively further from metropolitan counties; averaging $10,987 for farms located in metro counties, $6,767 for farms in rural counties adjacent to metro counties, and $6,090 for farms in remote rural counties. (Martinez et al., 2010, p. 18)

Restated, farms in or near metropolitan areas represent the majority of farms with direct sales, the majority of total direct sales, and higher per farm direct sales. Therefore, potential regional food hubs should be located close to their markets to be considered "local."

Efficient Distribution Networks.

A successful local food system needs an efficient distribution network. Food has to be transported effectively once harvested from the farms to the aggregator(s) and then to the market(s). Highly perishable items, like fruits and vegetables, have to be transported frequently to market. Unlike the fixed costs of transportation (i.e. vehicle loans and insurance) that are unaffected by distance traveled, the variable costs of fuel and labor for transportation increase proportionately to the distance traveled. Shortening the distance, route efficiency, and maximizing loads (both to market and "backhauling"[9]) can decrease variable costs.

Development Pressure.

In rapidly urbanizing counties the barriers for successful agriculture production are great. Historically, farms closest to urban centers provided the majority of the perishable agricultural products, namely fruits and vegetables. This is still the case today as shown in Figure 4.2 where "63 percent of dairy products and 86 percent of fruits and vegetables" in the United States are grown in urban influenced areas (AFT, 2003).

[9] Backhauling refers to carrying products for other companies back to the original area rather than returning with an empty truck. A fee is charged to the other company for providing this service.

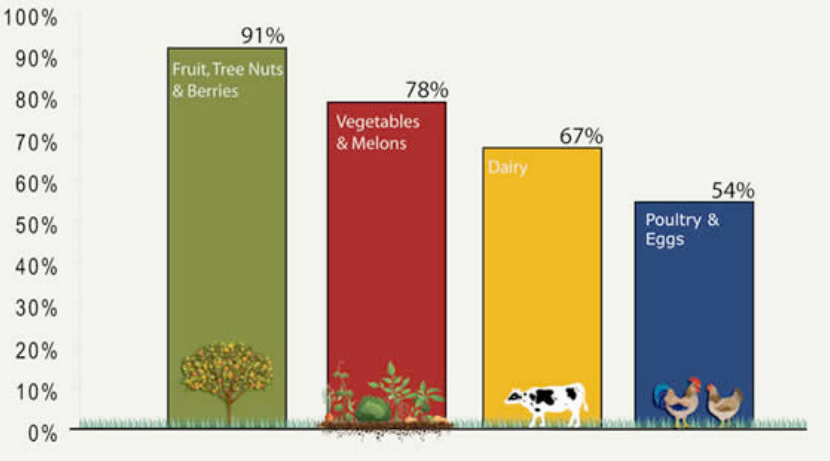


Figure 4.2: Percentage of Food Products Grown in Urban Influenced Areas in the United States. Source: American Farmland Trust, 2003

Development pressure on farms in urban influenced areas can be huge. Farms in the path of sprawl are frequently only worth $1,000-$2,000/acre in agricultural production, but can be worth $10,000-$20,000/acre to a developer. This is because the qualities of good farmland, flatness and well-drained soil, are the same qualities that are attractive to developers. From 1992 to 1997, the National Resources Inventory (NRI) identified that more than 11 million acres of rural land was converted to developed use with almost 6 million of those areas being farmland. Put another way, more than a million acres of farmland was lost a year from 1992 to 1997 (AFT, 2003). This was a 50% increase from the five years before that and data show that these rates continued to increase until the economic recession of 2008 and the subsequent slump in home construction across the county.

Ideally though, an area pursing a regional development plan around local food production should be rural without impeding development pressure for more reasons than just increased property values and taxes. Even if land remains in active agricultural production, impeding or perceived development pressure can cause farmers to pause before investing resources and infrastructure in their land. This situation has been called "impermanence syndrome" (Conklin

& Lesher, 1977; Esseks et al., 2009; Lockeretz, 1989). The logic behind impermanence syndrome is simple. Why make improvements on something that might get sold to a developer and cease being a farm?

Good Soils.

Soil is the foundation for agriculture and all other land uses. The quality and quantity of various soil types determine what vegetation is possible and influences agricultural use. It is a natural resource that can be depleted through nutrient loss and erosion and cannot easily be replaced by natural processes in a single human lifespan. The health of soil also determines a farm's need for additional inputs.

Existing Farmland.

Land that has been developed for non-agricultural purposes is unlikely to be converted back to production agriculture on a large scale. This does not mean that agriculture cannot occur, quite effectively, at smaller scales in developed areas. Container gardening, home gardening, community gardening, rooftop gardening, and urban farming all represent successful models of growing food in developed areas. However, this criterion looks at larger scale production and requires larger tracts of land engaged in agricultural production.

Farms Oriented to Local Markets.

In their report, "Sustaining Agriculture in Urbanizing Counties," Esseks et al. identify three types of agricultural activities with promising future success through interviews with farmers and agricultural professionals. These three agricultural activities are "(1) smaller farm operations, (2) those producing food for local consumers, and (3) those emphasizing high-value crops" (Esseks et al., 2009, p 169). The report also recognizes that the same farm can have all three of these traits. The Delaware Valley Regional Planning Commission found this to be true

for the Greater Philadelphia area when reviewing the 2007 Census of Agriculture. Those counties with farms engaged in direct farm-to-consumer sales had the largest increase in new farmers (DVRPC, 2010). This suggests that the new opportunities in farming geared towards local markets are attracting new farmers. As these farms build in-roads into the marketplace, the opportunities for new agricultural venues increase.

Critical Mass of Farms.

Thomas Daniels, Professor of City and Regional Planning in the University of Pennsylvania School of Design, sees a need for retaining a critical mass of farmland for a successful farmland preservation program. Depending on the type of agriculture, Daniels identifies this critical mass to be $50 million in gross farm sales and 100,000 acres in farm use (Daniels, 2000). This critical mass is needed to ensure the economic viability of all the farms and farm-related business (e.g. tractor supply and repair companies). The issue of a critical mass of farms is equally important for the success of a regional food hub.

Criteria Indicators

Various indicators could be used for each of the criteria identified above. The indicators chosen represent those for which there are publically-available county-level quantitative data.

Establishing the farms' proximity to markets requires that markets must be located. Everyone eats, so every person represents a consumer. Therefore population density is one accurate measure for markets. Another measure for markets could be Metropolitan Statistical Areas (MSAs) working with the assumption that metropolitan areas represent higher population densities than non-metropolitan areas. The thesis uses a combination of population data and MSAs. This combination was chosen because residents do not always live, work, and purchase food in just one county, but they do typically stay within an area.

For efficient distribution networks, two main factors are at play. In localized food systems, roadways are almost exclusively the mode of transportation rather than transportation by railcar, airplane, or ship. The first factor is the density of the transportation network, which permits more opportunities for route planning. The second factor is the typology of transportation (i.e. interstate road, major state road, county road, private road, etc), which is typically reflective of road condition. The interstate system is typically better maintained and allows for uninterrupted driving at a constant rate while county roads are typically less well maintained and require frequent stops and changes in speed limit.

Population projections indicate development pressure. Counties without projected population growth are less likely to experience development pressure than counties with high projected population growth. Population projects from the Georgia Office of Planning and Budget are used (OPB, 2010).

The USDA delineates soils into several broad categories reflecting soil quality for agricultural purposes. These categories are prime farmland, farmland of statewide importance, farmland of local or unique importance, prime farmland if managed, and not prime farmland[10]. These GIS maps are available from the Natural Resources Conservation Services' Soil Data Mart service. The maps are downloadable by soil survey area consisting of 1 to 3 county regions.

[10] Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding. (NSSC, 2011)

Existing farmland data are pulled directly from the 2007 Census of Agriculture. The number of farms with direct sales, also from the 2007 Census of Agriculture, is used to indicate farms oriented to local markets.

Analysis

All the following analysis is performed in GIS. GIS is a system for analyzing information that references data based on geographic location, like cartography, spatial analytics, and databases all rolled in one. A powerful feature of GIS is the ability to overlay various sets information and analyze it all based on at least one shared variable, typically a shared spatial coordinate. In the case of finding potential regions for a food hub, each of the indicators is mapped. Then the data are grouped into value sets and reclassified with a priority ranking so that areas with the multiple desirable characters emerge from the surrounding areas with less desirable characteristics.

For example, proximity to markets is represented by distance from the market, which is a continuous variable, i.e. 1 mile, 2 miles, 3 miles, etc. The distance data are grouped, i.e. 0-49 miles, 50-99 miles, 100-149 miles, etc, and then reclassified so that 0-49 miles is now a 1 which is most preferable and 50-99 miles is a 2 which is less preferable and so on. Then, development pressure, represented by the change in population between 2010 and 2030, is grouped, i.e. loss-in-population to 4,999 new residents, 5,000 new residents to 9,999 new residents, etc. These value sets are also reclassified, so loss-4,999 is now a 1 which is most preferable, and 5,000-9,999 is now s 2, which is less preferable, and so on. Overlaying the maps, an area with a 1 for proximity and a 1 for development pressure will score 2 which is lower and better than an area with a 1 for proximity and 2 for development pressure that scores a 3.

The first step for my analysis was identifying the eleven MSAs in Georgia and their populations as shown in Table 4.1 below. These MSAs represent the markets and consumer base for regional food systems in Georgia.

MSA	2006 Population Projections	Percent Population	Weighted Overlay Percentage in GIS
Albany	163,961	2%	2%
Athens	185,479	2%	2%
Atlanta	5,478,667	64%	64%
Augusta	523,249	6%	6%
Brunswick	100,613	1%	1%
Chattanooga	658,201	8%	8%
Columbus	437,222	5%	5%
Dalton	134,397	2%	2%
Macon	381,641	4%	4%
Savannah	394,036	5%	5%
Valdosta	126,305	1%	1%
TOTAL	**8,583,771**	**100%**	**100%**

Table 4.1: Georgia MSAs and population.

MSA shapefiles were created by selecting the counties corresponding to each MSA in GIS and then exporting the individual MSA shapefile with all the counties. Once exported, the shapefile was dissolved, removing the county boundaries to create one boundary just for the MSA.

I then created a operation to run on each MSA shapefile to create proximity buffers. This operation took the MSA shapefile, created a 50-mile buffer, took that 50-mile buffer and made another 50-mile buffer for a 100-mile buffer, took the 100-mile buffer to make a 150-mile buffer, and then the 150-mile buffer to make a 200-mile buffer. Then, all four buffers, each at a 50-mile interval, were dissolved into the MSA shapefile using the "Union" tool to create one shapefile for each MSA with its four buffers. Then each MSA/buffer shapefile was converted to raster image using the "Polygon to Raster" tool.

Next I ran a "Weighted Overlay" analysis with all 11 raster images. The weight given to each MSA/buffer raster image was based on the percentage of metropolitan population each

MSA as shown in Table 4.1. The MSA themselves were given classified as "restricted," mean that the areas within MSAs were excluded from the analysis. Each 50-mile buffer was assigned a value of 1 for most desirable, each 100-mile buffer as 2 for more desirable, each 150-mile buffer as 3 for less desirable, and each 200-mile buffer as 4 for least desirable.

The resulting map is shown in Figure 4.3. The areas closest to the greatest number of residents living in multiple MSAs are colored dark blue.

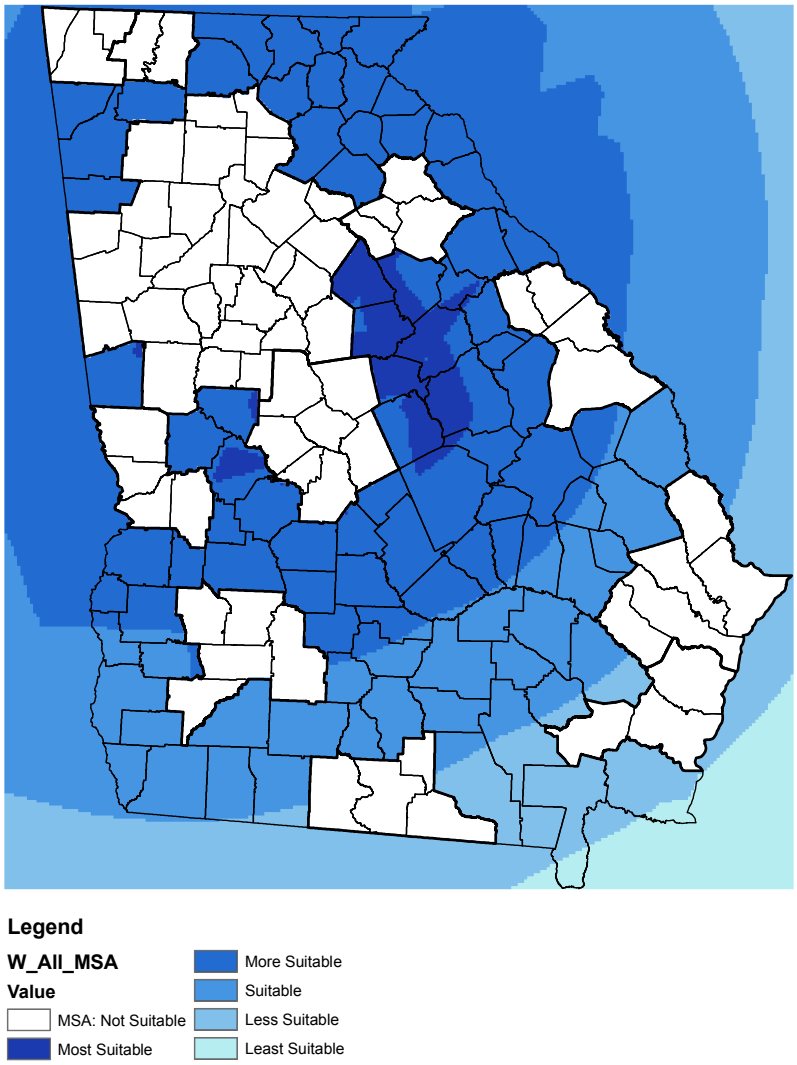


Figure 4.3: Area proximity to MSAs in Georgia.

For distribution networks, the first distribution analysis looked at network density for all major road infrastructures in Georgia. With the exception of parts of the Chattahoochee National Forest in North Georgia and the Okefenokee National Wildlife Refuge in South Georgia, almost every part of the state is within 5 linear miles of a major road infrastructure. This information was not used in further analysis, as it did not distinguish areas within the state from one another. The second distribution map looked at proximity to the interstate system in Georgia. The interstate system in Georgia is the most spatially differentiated transportation investment in Georgia as shown in Figure 4.4.

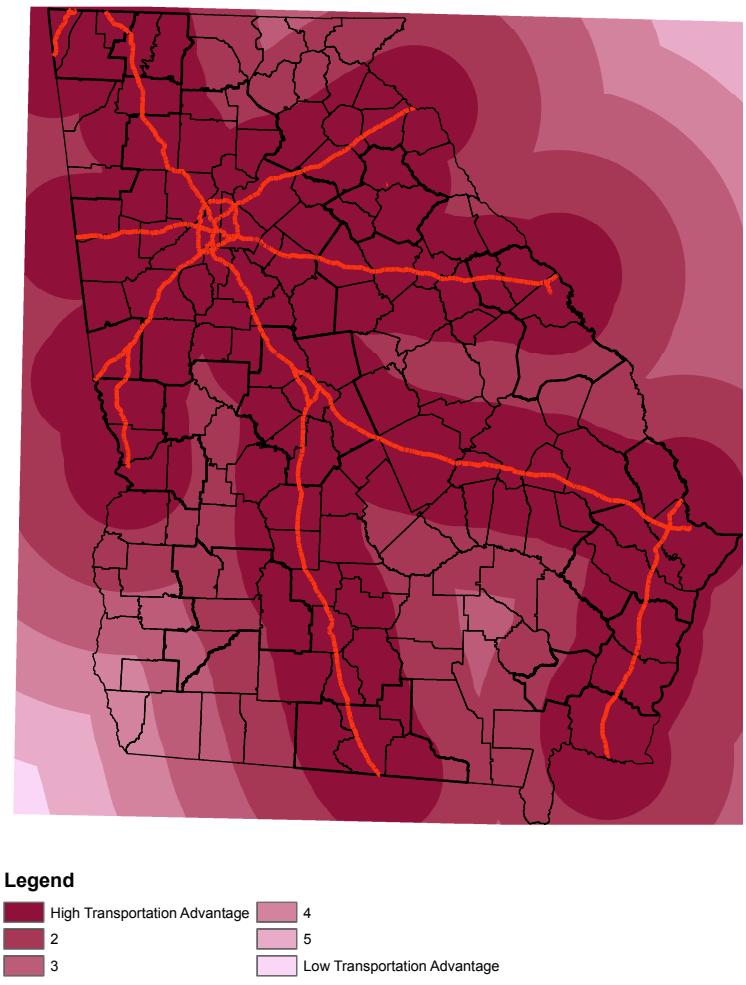


Figure 4.4: Linear Proximity to the Interstate System in Georgia

In GIS, I used the "Euclidean distance" tool to create buffers from the interstate in 25-mile increments. The distance is measured linearly from all points in the interstate even though the interstate system can be accessed only at defined exit points. Areas closer to the interstate are ranked higher than areas further from the interstate. The areas in dark red in Figure 4.4 represent areas closest to the interest with a transportation advantage. Ideally, a network model would be created that would measure buffers from interstate exits along other road networks.

Development pressure is expressed using population projections. Population projections to the year 2030 for counties in Georgia are shown in Figure 4.5. Darker green counties are the counties with higher projected population growth with higher future development pressure. Lighter green counties are the counties with lower projected population growth with less future development pressure. The counties in red represent the counties that are estimated to lose population in the next 20 years.

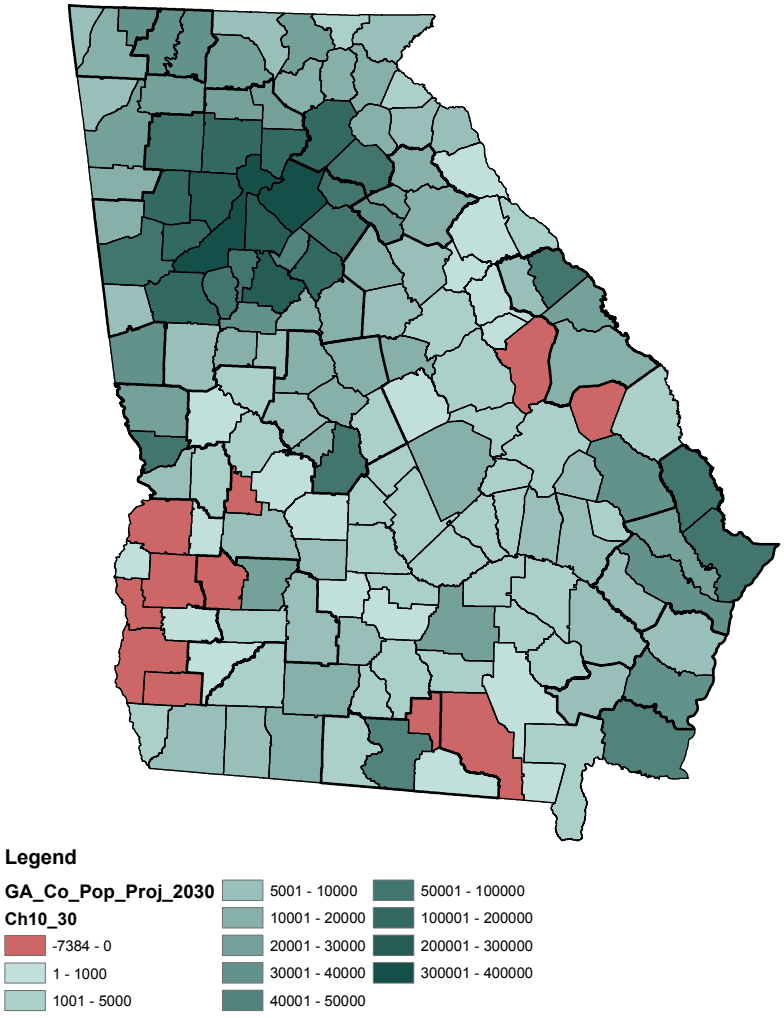


Figure 4.5: Projected Population Change from 2010 to 2030 in Georgia.

In GIS, these projected changes in population were grouped and reclassified so that areas with little or no population change where ranked higher than counties with greater population change.

Soil maps were downloaded for every county in Georgia from the Soil Data Mart. For most counties, complete tabular and spatial data is available. However, some counties (McIntosh, Chattahoochee, Marion, Fanning, Union, Murray and Whitfield) have incomplete tabular and spatial data where not all tabular data has been spatially mapped. Other counties (Greene, Screven, Brantley, Charlton, Dade, Walker, Clinch, Echols, Hancock, Taliaferro, Harris, and Talbot) have only tabular data that may not be complete and that has not been

spatially mapped. For counties without spatial data, the state-wide SSURGO soils map was downloaded. SSURGO GIS data does not include prime farmland classifications. Therefore, I correlated the soil physiographic information for prime farmland from neighboring counties with complete geospatial data to the counties without complete data, assuming that prime farmland would share similar physiographic characteristics.

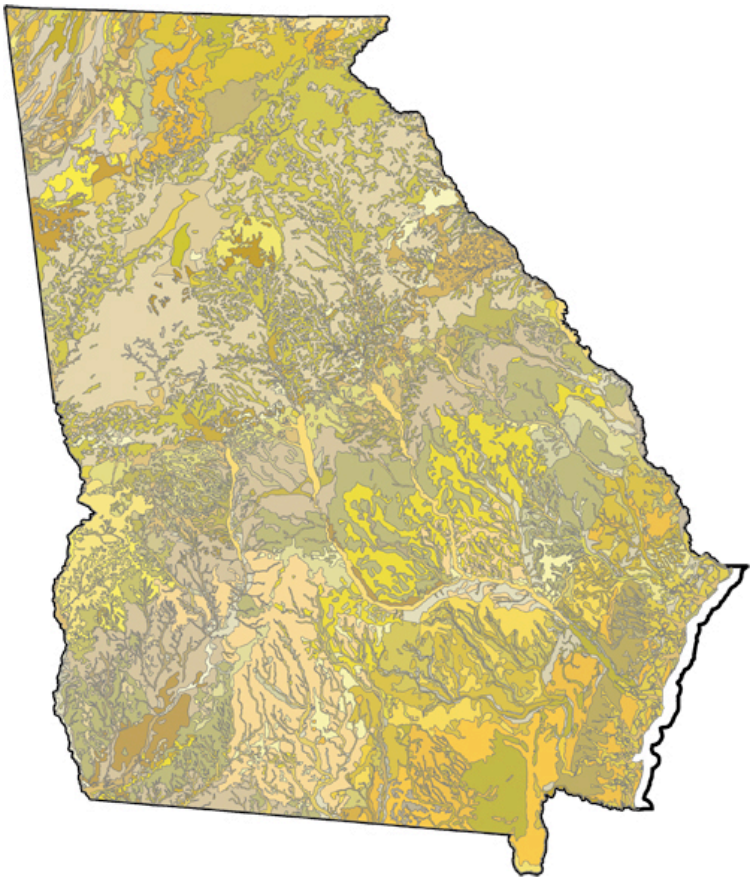


Figure 4.6: SSURGO Soil Map for Georgia

Existing farmland in 2007 is show in Figure 4.7. Counties with darker green represent the counties with largest acreages of farmland while counties with lighter green represent the counties with smaller farmland acreage.

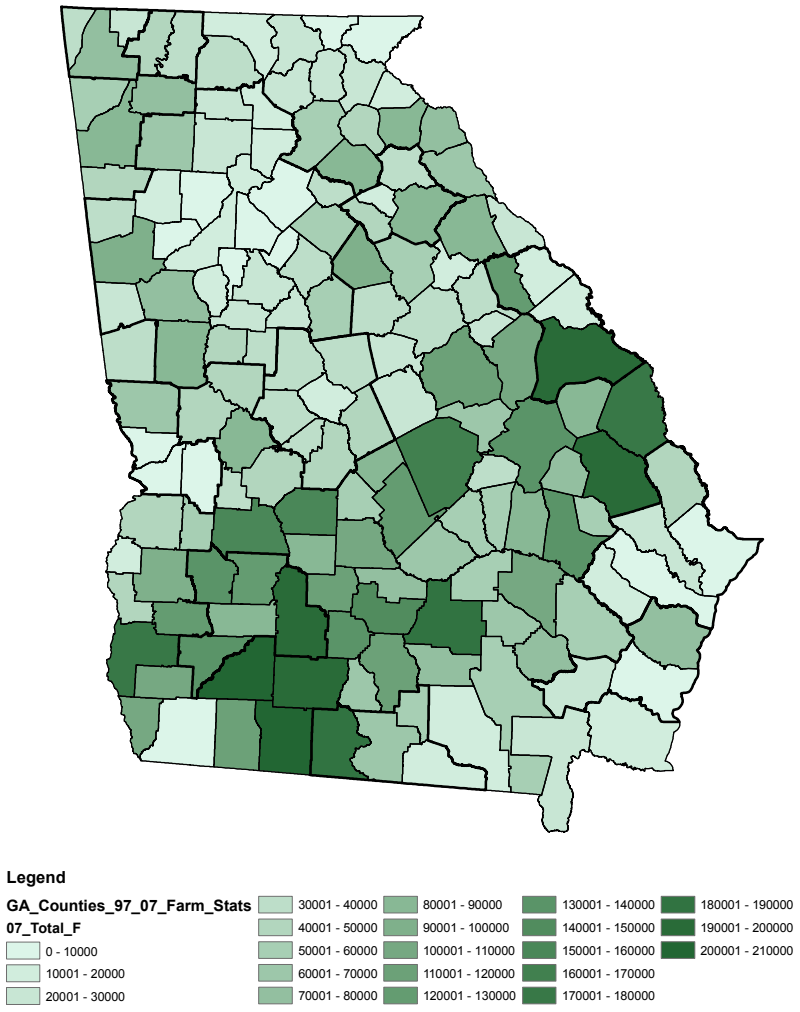


Figure 4.7: Acres of Farmland in 2007.

In GIS, the acres of farmland were grouped and reclassified so that areas with more farmland acreage were ranked higher than counties with less farmland.

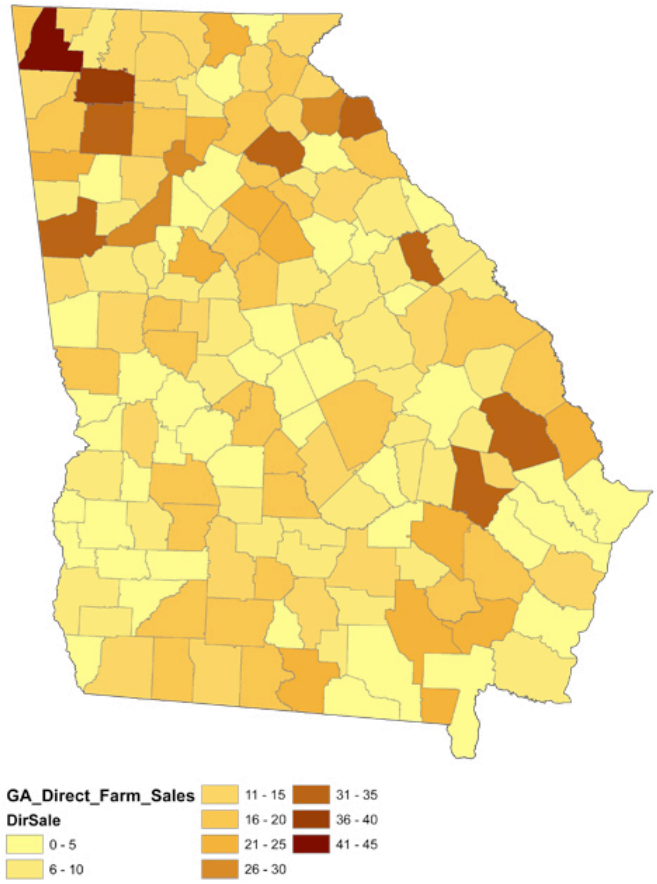


Figure 4.8: Number of Farms with Direct-to-Consumer Sales in 2007.

In GIS, the number of farms with direct sales was grouped and reclassified so that areas with more farms with direct sales were ranked higher than counties with fewer farms with direct sales.

After each of the indicators was mapped and reclassified with a consistent priority ranking system where 1=most suitable and 5=least suitable. Each indicator was given a specific weighted influence (proximity to markets=30%, distribution=10%, development pressure=20%, soils=10%, existing farmland=10%, and farms selling to local markets=20%). All the indicators were overlaid with their weighted influence. Figure 4.9 represents the final weighted overlay process with the final map on the right with the most suitable areas in green, more suitable areas in yellow, less suitable areas in orange, and least suitable areas in read.

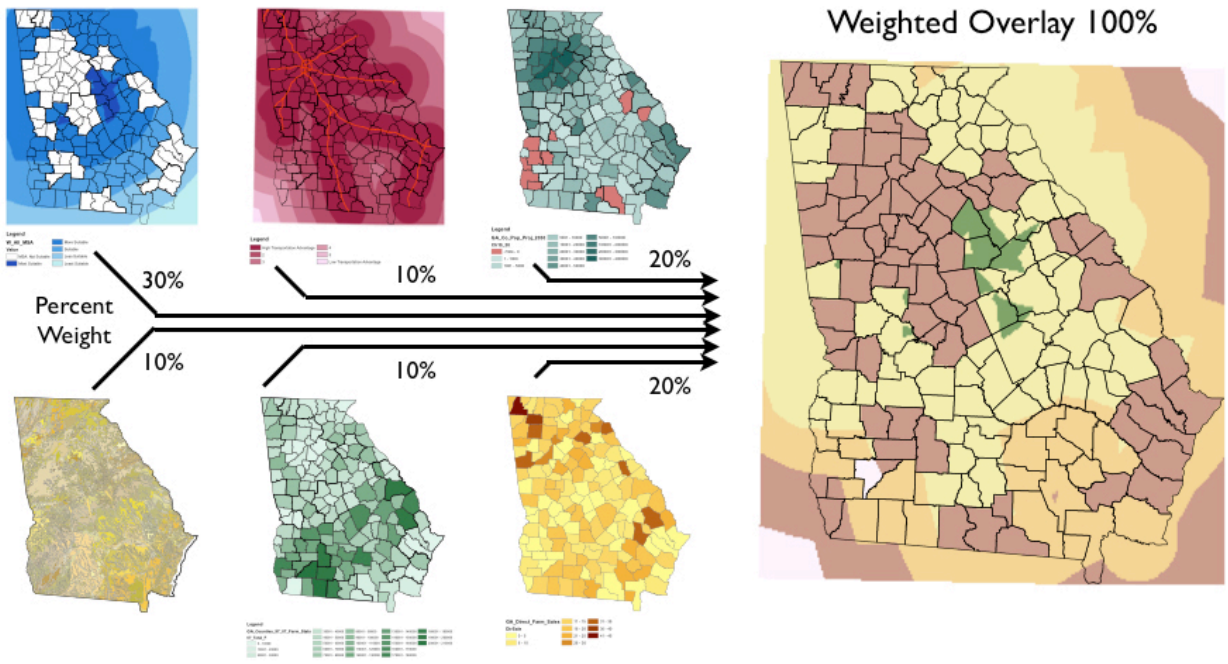


Figure 4.9: Weighted Overlay Operation in GIS

From this final map, the eleven county area of Baldwin, Glascock, Greene, Hancock, Jefferson, Morgan, Putnam, Taliaferro, Warren, Washington, and Wilkinson emerges as an area for a potential food hub based on the criteria developed and indicators used.

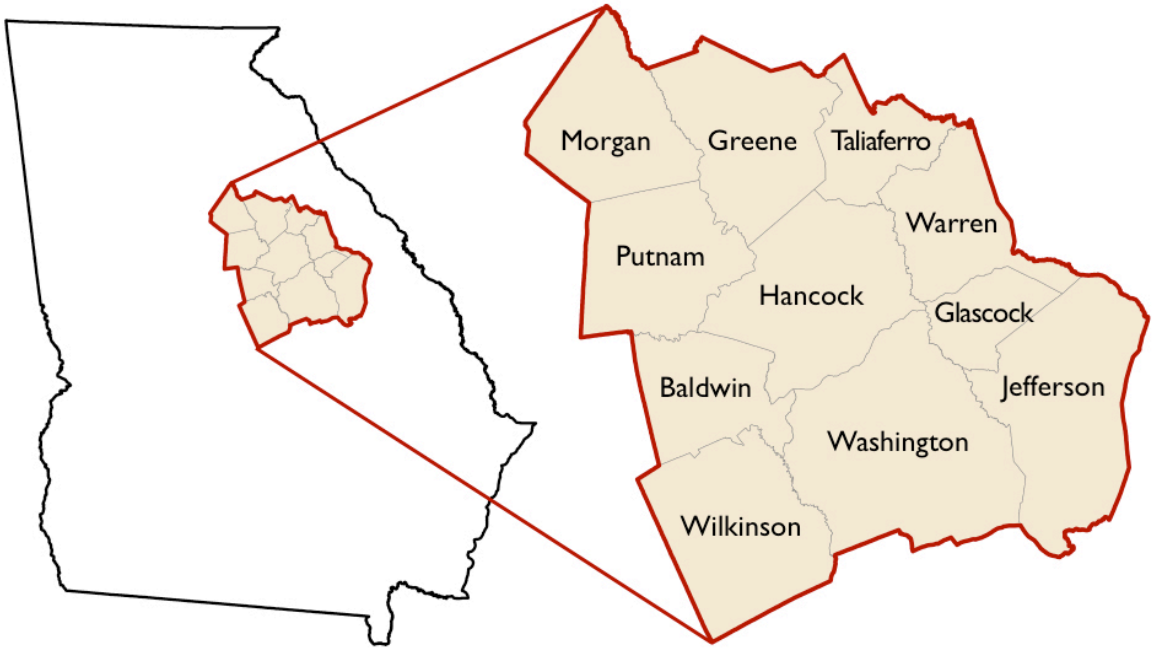


Figure 4.10: Selected Study Area

Conclusion

The methodology proposed in this chapter represents a very rough first pass at identifying a region in Georgia with characteristics that would suggest a regional food hubs would have a greater chance of success based on what is currently known about regional food hubs and direct-to-consumer farm sales. The seven criteria identified are limited by the requirements that the data is nationally available at the county level and easily mapped in GIS. Other criteria, like ground water availability, were not chosen because they did not meet the data requirements that I set out initially. This does not mean that other criteria is not important, just that it may be more appropriate to investigate these characteristics once a region has been found after this first sweep.

CHAPTER 5

FOOD SYSTEM ASSESSMENT

Chapter 4 identifies a region in Georgia that could be a potential location for a food hub. This chapter describes the existing characteristics of the region in greater detail before specific recommendations for building a food hub in the region are addressed in Chapters 6 and 7. A food system survey is the most appropriate tool for describing the existing food system in the region. A typical food system assessment addresses all of the components of the food system: (1) production processes, (2) food distribution, (3) food preparation and preservation, (4) food use and consumption, (5) the recycling and disposal of food wastes, and (6) the various support systems. However, this assessment focuses on production, food distribution, and consumption through the food economy.

Data Sources

This food system assessment draws on various sources of county-level agricultural data in Georgia, each with its particular strengths and weaknesses.

The first data source is the Census of Agriculture compiled and published by the USDA. The Census of Agriculture is taken approximately every five years and depends directly on participation by farmers and ranchers to fill out data for their own farms. The National Agricultural Statistic Service (NASS) maintains a Census Mailing List (CML) with contact information for agricultural places meeting the USDA definition of a farm, operations with $1,000 or more of agricultural sales a year. The NASS goes through great lengths to maintain the most accurate CML possible. However, they admit, “In general, farms not on the mail list

tended to be small in acreage, production, and sales of agricultural products" (NASS, 2009a). The response rate for the 2007 Census was 85.2%. Due to provisions of Title 7 in the United States Code, any information collected that would disclose information about the operations of a specific farm is not reported and coded with a "D" instead.

Data from the Census of Agriculture is available in online digital compiled reports for the entire US and states or states and counties. It is also available via the NASS's website in an interactive statistical database called Quick Stats 2.0 with over 12.5 million records. Data inquiries from Quick Stat 2.0 can be saved as a url, printed, downloaded as a spreadsheet, or mapped in an online GIS application.

The advantage of the Census of Agriculture is its national scope, comprehensiveness, and that data are collected from the farmers themselves. The disadvantage of the Census of Agriculture is its publication schedule of once every five years. This schedule identifies national trends in agriculture well, but does not always capture subtle changes at the county level. This thesis will use information taken from the 1945 to 2007 Censuses of Agriculture.

The second data source is the Georgia Agricultural Statistical Service, a state division of the NASS operating in cooperation with Georgia's Department of Agriculture and the University of Georgia's Cooperative Extension Service. The Georgia Agricultural Statistical Service compiles and publishes an annual report called Georgia Agricultural Facts (Ag Facts). Ag Facts combines data directly from producers, agribusiness, extension personnel, and some direct field observation. The reports cover a range of topics including farm income and expenses, crops planted and harvested, production value, price estimates, and weather. Reports are available in online digital compiled reports. However, this report was "discontinued after the 2009 issue due

to budget and resource" problems (GA-NASS, 2011). This thesis will not use any data from Ag Facts.

The third data source, the University of Georgia's Center for Agribusiness and Economic Development (CAED), compiles and publishes a yearly Georgia Farm Gate Value Report (FGVR). The FGVR is focused solely on the value of production data. Farm gate value (FGV) refers to the net value of agricultural and aquacultural products when it leaves the farm, after marketing costs have been subtracted. In general, farms do not have significant marketing budgets as most sell directly to wholesalers or they have production contracts. Therefore, FGV is assumed to be the wholesale commercial price of a product sold from farms.

The FGVR is compiled exclusively from surveys of Cooperative Extension county agents. Individual cooperative extension agents report the number of whole acres of production of a single crop in their county. CAED calculates an average annual yield per crop per acre by region of Georgia, based on agricultural specialist information, and then averages the wholesale market value of the particular crop. Small diversified farms grow multiple crops on one acre of land, making these estimates very difficult for extension agents to give to CAED and, in turn, for CAED to calculate. The economic impact of organic production is treated separately from conventional production because production values and wholesale prices differ dramatically from conventional production and marketing. Calculations for direct-to-consumer and retail sales are not included because these prices are set differently at every direct market venue, e.g. each farmers' market sells produce at different prices. This adds to the difficulty in quantifying the economic impact of local direct-market oriented sustainable agricultural production.

FGVR are available online as compiled reports with state and county data, as individual county fact sheets, and through the Georgia Statistical System, an online interactive statistical

database maintained by the CAED, the Department of Agricultural and Applied Economics, and the University of Georgia Cooperative Extension Service. The Georgia Statistical System allows for county-by-county analysis that includes up-to-data variables from the most recent FGVR as well as year-by-year analysis that include data variables from the Census of Agriculture going back to 1945.

Demographics and Employment

Regarding population, the entire region identified as a potential food hub in Chapter 4 has an estimated 165,041 residents with an average population density of 40.31 people per square mile, but these residents are not distributed evenly in the counties as shown in Table 5.1 below. Taliaferro had the smallest estimated population in 2009 with only 1,812 residents, 1.70% of the regional population, as well as the smallest number of people per square mile with a little more than 9 people per square mile. From 2000 to 2009, Taliaferro had the lowest population change rate of -12.76%, most of change due to outmigration from the county. Baldwin had the largest estimated population in 2009 with 46,337 residents, 28.08% of the regional population, as well as the highest population per square mile with slightly more than 187 people per square mile. From 2000-2009, Morgan had the highest population change rate of 21.38% due mainly to migration into the county.

TABLE 5.1: POPULATION	Population est., 2009	% of regional population	Persons per sq. mile
Baldwin	46,337	28.08%	178.42
Glascock	2,801	1.70%	19.49
Greene	15,743	9.54%	40.64
Hancock	9,219	5.59%	19.59
Jefferson	13,163	7.98%	31.30
Morgan	18,761	11.37%	53.96
Putnam	20,495	12.42%	59.48
Taliaferro	1,812	1.10%	9.31
Warren	5,755	3.49%	20.24
Washington	20,879	12.65%	30.77
Wilkinson	10,076	6.11%	22.57
Region sum	**215,422**	**100.00%**	**40.31**

Table 5.1: Population. Data source: US Census American Community Survey 2005-2009

Regarding race, the region is part of the historic African-American Cotton Belt in the South. In several counties (Hancock, Taliaferro, Warren, and Washington), African Americans constitute more than 50% of the population, with the regional average at 40% of the population. Again, there is an exception with only 12.32% of the population in Glascock County identifying as African American. Less than 5% of the population in any county identifies as being Hispanic, with the average at 3.12%.

TABLE 5.2: RACE DISTRIBUTION	% Non-Hispanic African American, 2005-2009	% Non-Hispanic Asian, 2005-2009	% Non-Hispanic Native American, 2005-2009	% Hispanic, 2005-2009	% Multi-Race, 2005-2009	% Foreign Born, 2005-2009	% European born, 2005-2009	% Mexican born, 2005-2009	% Non-English Speaking, 2005-2009
Baldwin	43.27	1.19	0.08	1.47	0.69	2.34	0.78	0.26	0.61
Glascock	12.32	0.00	0.00	0.37	1.46	0.99	0.11	0.00	0.00
Greene	38.59	0.00	0.56	3.70	0.63	2.46	0.42	1.71	0.84
Hancock	75.98	0.31	0.00	0.44	0.00	1.53	0.00	0.32	0.22
Jefferson	54.90	0.30	0.00	2.14	0.40	1.81	0.19	1.20	0.33
Morgan	24.54	0.70	0.22	1.80	1.05	1.85	0.20	0.55	0.75
Putnam	27.84	0.34	0.00	4.58	0.25	4.98	0.33	3.39	1.35
Taliaferro	59.85	0.00	0.21	3.27	1.50	1.61	0.75	0.00	0.00
Warren	57.94	0.20	0.05	0.25	0.12	0.15	0.00	0.00	0.00
Washington	52.24	0.15	0.00	1.36	0.56	1.11	0.01	0.85	0.04
Wilkinson	39.56	0.00	0.20	2.07	0.43	1.11	0.02	0.77	0.94

Table 5.2: Race Distribution. Data source: US Census American Community Survey 2005-2009

Educational attainment in the region remains relatively low, although great strides have been made over the last 30 years. The regional percentage of adults without a high school degree is 27.1%, with a high school degree only is 39.3%, with some college experience is 15.0%, and with a college degree or higher is 18.5% as shown in Table 5.3.

TABLE 5.3: EDUCATION DISTRIBUTION	% no high school degree, 2005-2009	% with high school degree only, 2005-2009	% with some college experience, 2005-2009	% with college degree or higher, 2005-2009
Baldwin	23.92	35.98	17.00	23.09
Glascock	34.39	40.53	13.00	12.08
Greene	24.43	38.04	13.27	24.26
Hancock	34.20	38.25	13.70	13.85
Jefferson	28.72	42.67	15.16	13.45
Morgan	20.48	34.59	16.56	28.37
Putnam	20.45	35.51	19.68	24.36
Taliaferro	34.89	42.92	8.69	13.50
Warren	33.50	42.27	13.60	10.63
Washington	26.51	39.80	18.38	15.31
Wilkinson	21.34	47.81	13.23	17.62

Table 5.3: Education Distribution. Data source: US Census American Community Survey 2005-2009

Median household income in 2009 for the region ranges from $25,102 in Hancock County to $44,296 in Morgan County. In 2009, the poverty rates for the counties range from 16.9% in Putnam County to 31.6% in both Hancock and Taliaferro. Per capita income in 2005-2009 for the region ranges from $11,250 in Hancock County to $25,188 in Putnam County.

TABLE 5.4: INCOME AND EMPLOYMENT SECTORS	Median Household Income, 2009	Per capita Income, 2005-2009	% employed in agriculture, 2005-2009	% employed in manufacturing, 2005-2009	% employed in services, 2005-2009	% employed in government, 2005-2009
Baldwin	$37,029	$17,481	1.64	12.00	52.89	7.11
Glascock	$34,129	$15,772	8.99	13.11	36.52	8.43
Greene	$38,613	$23,919	3.15	10.72	48.48	3.90
Hancock	$25,102	$11,250	0.87	21.00	55.22	5.78
Jefferson	$29,835	$15,087	3.77	20.80	41.64	7.36
Morgan	$44,296	$25,181	6.20	14.46	46.25	5.81
Putnam	$41,604	$25,188	1.87	15.65	40.35	4.70
Taliaferro	$25,293	$13,248	3.96	19.79	49.57	6.71
Warren	$30,056	$15,816	2.71	27.53	39.18	5.88
Washington	$32,698	$15,322	8.45	13.56	43.72	9.03
Wilkinson	$34,660	$17,486	9.15	17.09	39.97	7.19

Table 5.4: Income and Employment Sectors. Data source: US Census American Community Survey 2005-2009

In the region, services employ the largest percentage of the working population for every county followed by manufacturing for every county. Neither agriculture nor government employs more than 10% of the population, although some counties employ a higher number of workers in agriculture than government and in others there are more workers in government than agriculture.

Agricultural resources

Agricultural land base.

In addition to looking at the population within the region, Table 5.5 shows the percentage of people in the region compared with the entire state. The region constitutes less than seven percent of Georgia's landmass and is home to less than two percent of the state's residents. The population density is a quarter of the state as well.

TABLE 5.5: General Characteristics	Region	Georgia	Region as Percentage of Georgia
2010 Population (persons)	172,089	10,068,340	1.71%
Total Land Area (sq. miles)	4,093.7	59,425	6.89%
Population Density (persons per sq. mile)	42.04	169.43	N/A
Total Agricultural Lands (sq. miles)	898.45	15,860.22	5.66%
Number of Farms, 2007	2,711	47,846	5.67%
Total Farm Gate Value, avg. 2002-2009	$430,519,699	$10,582,499,780	4.07%
Total Market Value of Agricultural Products Sold, 2007	$242,748,000	$7,112,866,000	3.41%

Table 5.5: General Regional Characteristics. Data sources: Population projections from the Georgia Office of Planning and Budget, 2007 Census of Agriculture, and Farm Gate Value Reports 2002-2009.

The region has more that five percent of the state's agricultural land and farms, and four percent of the average farm gate value over the last eight years, though less than three and a half percent of total market value of agricultural products sold according to the 2007 Census of Agriculture.

Farm characteristics.

The USDA Census of Agriculture used four overlapping land uses to describe farmland. These are cropland, pastureland, woodland, and other uses. Cropland is broken down into harvested cropland, cropland used for pasture or grazing, and cropland on which nothing was pastured, grazed or harvested for whatever reason. Cropland used for pasture is land that could have been used for cropland without improvements being made to the land. Permanent pastureland represents all land that does not qualify as woodland pasture or cropland pasture. Woodland pasture includes all woodlands that were used for pasture or grazing at any point in the census year. Woodland includes both natural and planted woodlots or timber tracts, although Christmas trees and short rotation woody crops are counted under cropland harvested. Other land is the catchall category for land in buildings, roads, etc.

TABLE 5.7: DETAILED TYPES OF FARMLAND	2002 (acres)	2007 (acres)	% Change (2002 to 2007)	Absolute Change (2002 to 2007, acres)
Harvested Cropland	133,936	135,694	1.31%	1,758
Other Cropland (idle, summer fallow, failed)	40,846	28,755	-29.60%	-12,091
Cropland only used for Pasture	69,945	41,807	-40.23%	-28,138
Permanent Pastureland	71,792	107,500	49.74%	35,708
Woodland, Not Pastured	202,907	183,471	-9.58%	-19,436
Woodland, Pastured	84,555	42,649	-49.56%	-41,906
Land in farmsteads, buildings, etc	34,378	33,499	-2.56%	-879

Table 5.7: Detailed Types of Farmland. Data Source: 2002 and 2007 Census of Agriculture.

As Table 5.7 shows, the majority of the region is woodlands, followed by harvested cropland and permanent pasture. While it is difficult to determine with certainty, the increase in permanent pastureland from 2002 to 2007 probably is a result of harvesting woodland without putting that land back into woodlots. Between 2002 and 2007, the region lost over 64,000 acres of farmland, accounting for the declines in other types of farmland.

The decline in the farmland in the region from 2002 to 2007 follows the larger trend of decreasing farmland as a percentage of land use in the region since 1949 as shown the graph below. Tables 5.8 and 5.9 on the next page show in greater detail changes in acreage and percentage of land use. Since the peak in 1949, slightly less than a million and a half acres have been removed from farming in the region.

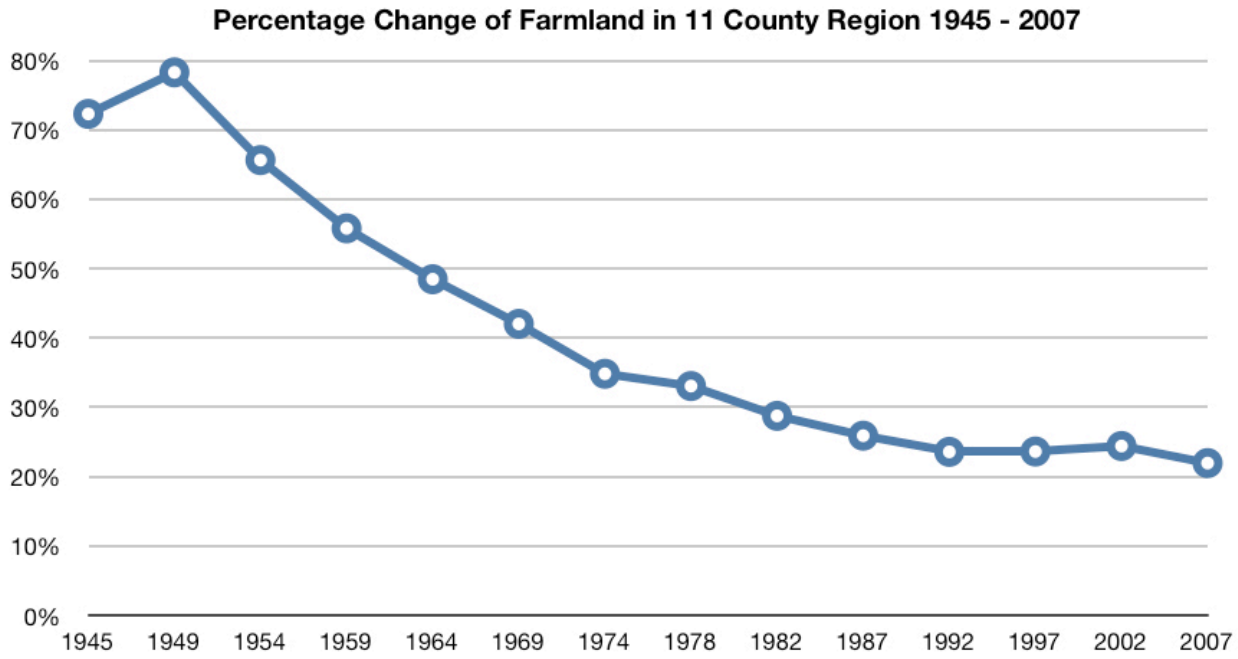


Figure 5.1: Farmland as a Percentage of Land Use, 1945-2007. Data source: Census of Agriculture.

According to the 2007 Census of Agriculture, there are a total of 2711 farms in the entire region. Taliaferro has the fewest farms with 71 while Morgan has the most at 657. As a percentage of land in the county that is in farms, Wilkinson has the lowest percentage at 10.5% and Morgan, again, has the largest with 41.5%.

TABLE 5.8: CHANGE IN # OF FARMS	# of Farms - 1945	# of Farms - 1949	# of Farms - 1954	# of Farms - 1959	# of Farms - 1964	# of Farms - 1969	# of Farms - 1974	# of Farms - 1978	# of Farms - 1982	# of Farms - 1987	# of Farms - 1992	# of Farms - 1997	# of Farms - 2002	# of Farms - 2007
Baldwin	893	692	464	324	268	196	181	188	148	135	118	171	194	170
Glascock	765	570	425	286	191	127	126	123	96	79	78	92	100	93
Greene	1,520	1,124	947	558	441	341	254	209	236	203	207	234	255	247
Hancock	1,611	1,317	1,130	643	515	285	184	171	151	138	102	129	144	172
Jefferson	2,086	1,669	1,230	871	680	521	430	401	391	339	295	406	388	315
Morgan	1,469	1,298	1,104	662	536	441	343	340	355	368	366	460	525	657
Putnam	896	657	535	323	234	215	172	160	167	174	166	184	225	215
Taliaferro	673	513	448	255	242	141	112	89	82	63	68	65	73	71
Warren	1,266	1,042	883	574	349	256	217	185	168	146	136	158	165	188
Washington	2,980	2,250	1,640	1,016	731	544	425	445	379	308	299	381	411	425
Wilkinson	1,000	845	601	361	252	252	178	172	162	121	99	105	127	158
REGION	**15,159**	**11,977**	**9,407**	**5,873**	**4,439**	**3,319**	**2,622**	**2,483**	**2,335**	**2,074**	**1,934**	**2,385**	**2,607**	**2,711**

Table 5.8: Change in Number of Farms 1945-2007. Data source: Census of Agriculture

TABLE 5.9: CHANGE IN % OF FARMLAND AS LAND USE	% Farmland - 1945	% Farmland - 1949	% Farmland - 1954	% Farmland - 1959	% Farmland - 1964	% Farmland - 1969	% Farmland - 1974	% Farmland - 1978	% Farmland - 1982	% Farmland - 1987	% Farmland - 1992	% Farmland - 1997	% Farmland - 2002	% Farmland - 2007
Baldwin	82.27%	95.14%	6.04%	49.49%	44.27%	33.88%	26.81%	28.44%	26.88%	22.06%	19.94%	18.56%	21.57%	18.11%
Glascock	73.73%	85.27%	76.72%	62.75%	54.65%	34.91%	35.94%	39.41%	30.75%	29.50%	30.94%	24.31%	22.81%	23.02%
Greene	68.20%	71.58%	62.96%	62.96%	52.29%	48.15%	31.83%	27.07%	23.19%	21.63%	18.81%	21.20%	21.02%	22.27%
Hancock	71.84%	69.38%	65.28%	42.29%	41.54%	26.95%	22.01%	19.03%	15.75%	14.73%	11.68%	11.98%	13.93%	12.55%
Jefferson	76.81%	88.52%	78.67%	72.65%	58.89%	53.95%	53.61%	53.56%	46.63%	41.92%	40.29%	43.37%	40.63%	32.25%
Morgan	87.36%	90.59%	82.78%	69.38%	69.55%	67.96%	53.87%	54.96%	49.20%	45.71%	41.59%	41.23%	39.86%	41.31%
Putnam	67.32%	62.35%	50.21%	43.64%	37.34%	37.07%	26.80%	20.63%	20.51%	19.19%	15.76%	14.58%	18.45%	17.12%
Taliaferro	63.80%	62.45%	61.75%	38.48%	37.80%	30.75%	26.73%	22.45%	17.75%	15.27%	15.44%	12.52%	14.83%	11.27%
Warren	73.08%	86.55%	86.04%	70.77%	55.24%	48.06%	42.34%	32.45%	32.71%	28.78%	25.72%	25.56%	26.27%	20.36%
Washington	73.54%	84.95%	77.25%	61.39%	52.74%	45.72%	37.98%	38.64%	30.59%	26.49%	25.68%	26.09%	28.49%	25.30%
Wilkinson	58.16%	63.64%	53.30%	33.61%	26.43%	24.50%	18.37%	18.52%	16.56%	15.12%	11.14%	10.49%	10.73%	10.46%
REGION	72.30%	78.29%	65.64%	55.80%	48.46%	42.02%	34.83%	33.06%	28.76%	25.90%	23.57%	23.62%	24.41%	21.95%

Table 5.8: Percentage Change Farmland as a Land Use 1945-2007. Data source: Census of Agriculture

There are certain indicators about the health of agriculture in a region based on whether or not agriculture is a viable livelihood for those engaged in it. One of these indicators is the percentage of operators who work off-farm for 200 or more days of the year. In the study area, the percentage range of operators working off-farm ranges from a low of 30.99% in Taliaferro County to a high of 43.06% in Washington County as shown in Table 5.10.

TABLE 5.10: FARM/FARMER CHARACTERISTICS	% operators working off-farm, 2007	% farms with less than $10,000 in sales, 2007	% farms with high-speed access, 2007	% farms with minority owners, 2007	% farms with women operators, 2007	% operators 65 and older, 2007	Operator Characteristics, Average Age of All Farmers, 2007
Baldwin	37.65	72.94	45.88	7.65	11.76	35.29	60.2
Glascock	41.94	76.34	13.98	2.15	10.75	35.48	59.1
Greene	42.11	61.94	25.91	8.10	15.79	29.15	58.7
Hancock	42.44	79.65	18.60	19.77	18.02	30.81	60.5
Jefferson	34.29	60.95	12.70	7.30	10.79	35.56	58.8
Morgan	38.96	70.62	30.90	5.78	18.42	34.70	59.6
Putnam	39.07	69.30	33.95	13.49	23.72	31.63	58.3
Taliaferro	30.99	76.06	9.86	14.08	22.54	25.35	56.2
Warren	42.55	79.26	20.74	2.66	30.85	37.23	60.2
Washington	43.06	72.24	24.71	7.53	13.88	36.00	59.2
Wilkinson	32.28	82.91	37.97	6.33	12.66	41.77	61.2

Table 5.10: Farm and Farmer Characteristics. Data source: 2007 Census of Agriculture.

Many farming households find that one or both spouse needs to work off-farm to keep the household finances in the black or to provide benefits like healthcare and specific retirement plans. It is not possible to tell from the data what percentage of farming households depends on off-farm jobs. If an off-farm job is not required to maintain a household, it might be due to the retirement of the principle farm operator where the household might be receiving government retirement benefits, i.e. social security, or other private retirement plans.

Another indicator about the health of agriculture in a region is the percent of farms earning less than $10,000 per year in sales. In the study area, Jefferson County has the smallest percentage of farms making $10,000 or less at 61.0%. Wilkinson County has the highest percentage at 82.9% of farms that made $10,000 or less. It is difficult to imagine a farm providing a living wage to an individual or household on $10,000. The low financial returns for certain forms of agriculture and that over 60% of farms in this 11-county region earn less than

$10,000 per year or less might be part of the reason the average age of farmers in the region is between 58 and 60 without another generation of farmers in line to continue farming.

Agricultural industry.

The Farm Gate Value Report (FGVR) provides descriptive annual county-level information about the production value of agricultural crops. The report's publication format has changed over time rendering some comparisons difficult to make from one format to another. Therefore, analysis of farm gate value (FGV) will only be drawn from the most recent FGVR with consistent formatting for the years 2002-2009. This eight-year period includes information that could also be analyzed from the 2002 and 2007 Census of Agriculture, but the year-to-year analysis afforded by the FGVR is preferred for its greater level of detail.

The FGVR breaks down production value into eight sectors: (1) Row/Forage, (2) Fruits/Nuts, (3) Vegetables, (4) Ornamental Horticulture, (5) Forestry, (6) Livestock and Aquaculture, (7) Poultry and Eggs, and (8) Other Farm Income. Row/Forage crops include hay, oats, rye, sorghum, soybeans, straw, wheat, and other row and forage crops. Fruits/Nuts production includes apples, blackberries, blueberries, grapes, peaches, pecans, strawberries, and other fruit and nut crops. Vegetable production includes cabbage, cantaloupe, cucumbers, eggplant, greens, okra, onions, peppers, snap beans, peas, squash, corn, tomatoes, watermelon, and other vegetable crops. Ornamental horticulture includes greenhouse production, container nursery, field nursery, turfgrass, and other miscellaneous ornamental horticulture. Forestry includes timber, pine straw, Christmas trees and other forestry products. Livestock and aquaculture includes horses, beef, dairy, pork, quail, sheep, goats, honeybees, catfish, and other livestock and fish production. Poultry and eggs include broiler integrators, boiler growers, breeder pullets, hatching layers, table layers, and other poultry. Other farm income includes

government payments, crop insurance, hunting leases, ag-based and nature-based tourism, and other miscellaneous items.

A FGV is provided for each crop in each county, totaled by each crop, totaled by sector for each county, totaled by entire sector, totaled for each county, and totaled for the entire state. CAED also provides a Farm Gate GROWER Value in their reports, which is the total farm gate value less the value of broiler-integrators. Broiler-integrators represent approximately 75% of the poultry commodity group value.

Table 5.11 below shows the 8-year breakdown for the 2002-2009 FGVRs for the 11 county region as a whole. Averaged over the 8 years, total FGV is a little over $430.5 million a year for the region. Livestock accounts for 33.5% of the total with over $144.2 million in FGV followed by poultry and eggs at 25.6% ($110.5 million in FGV), forestry at 13.5% ($58 million in FGV), row and forage at 12.8% ($55 million in FGV), ornamental horticulture at 8% ($34.5 million in FGV), and other income, primarily in government payments, at 5.2% ($22.4 million in FGV). Fruit/nut and vegetable production accounts for less than 1.5% of production value with just over $5.9 million in FGV. Over all, the region represents about 4.1% of Georgia's average $10.6 billion in FGV. Taking out the broiler-integrators and looking at just total GROWER FGV, the region represents 5.1% of Georgia's average $7 billion in GROWER FGV.

TABLE 5.11: REGIONAL FARM GATE VALUE	2002	2003	2004	2005	2006	2007	2008	2009
Row/Forage	$38,464,706	$51,617,549	$51,260,716	$56,880,039	$54,127,999	$62,600,412	$64,329,520	$60,807,862
Fruits/Nuts	$1,291,033	$3,146,585	$5,521,800	$4,971,769	$3,943,265	$1,375,749	$4,009,749	$5,989,393
Vegetables	$1,264,624	$975,738	$1,196,199	$2,954,542	$2,557,772	$2,658,769	$2,647,953	$2,675,135
Ornamental Horticulture	$21,052,696	$22,132,842	$27,048,664	$27,830,980	$34,287,548	$48,263,842	$50,606,678	$44,982,328
Forestry	$59,618,054	$55,424,795	$69,553,165	$74,026,547	$62,679,694	$55,866,127	$49,854,074	$37,170,778
Livestock and Aquaculture	$125,558,667	$138,567,447	$163,269,405	$134,156,260	$130,930,323	$152,833,551	$136,309,633	$172,220,305
Poultry and Eggs	$82,921,001	$97,185,243	$112,531,070	$101,673,314	$91,239,361	$130,193,724	$145,134,821	$122,954,455
Other Income	$18,693,738	$24,123,975	$19,193,700	$22,653,207	$18,874,446	$23,391,698	$25,274,646	$26,605,909
Total FGV	**$348,864,519**	**$393,174,174**	**$449,574,719**	**$425,146,658**	**$398,640,408**	**$477,183,872**	**$478,167,074**	**$473,406,165**
Total GROWER FGV	*$289,640,652*	*$332,318,371*	*$376,862,831*	*$353,174,859*	*$347,394,595*	*$409,420,613*	*$368,802,799*	*$370,370,119*
State Total	**$8,825,753,907**	**$9,859,173,985**	**$10,283,536,190**	**$10,579,891,717**	**$10,366,342,023**	**$11,566,159,994**	**$11,922,405,911**	**$11,256,734,510**
% of State Total	3.95%	3.99%	4.37%	4.02%	3.85%	4.13%	4.01%	4.21%

Table 5.11: Regional Farm Gate Value from 2002-2009. Data source: Georgia Farm Gate Value Reports.

Looking at various commodity sectors in the region as a percentage of state commodity production, the region emerges as a relatively strong producer of livestock accounting for an average 11.9% of the states total livestock FGV. Morgan and Putnam counties routinely trade the number 1 and 2 ranking for highest livestock FGV in the 8 years examined. Even though poultry accounts for a quarter of the regions FGV, the region only contributes an average of 2.3% of poultry/egg FGV for Georgia. Ornamental horticulture and forest each represent approximately 5% of FGV each for their commodity sectors in the state and 8.0% and 13.5% of the regions total FGV. Row and forage crops account for 12.8% of the region's FGV but only 3.3% of the state's FGV. Fruit/nut and vegetable production in the region represents less than one percent of the region's FGV and 1.5% and 0.3% of the state's FGV respectively.

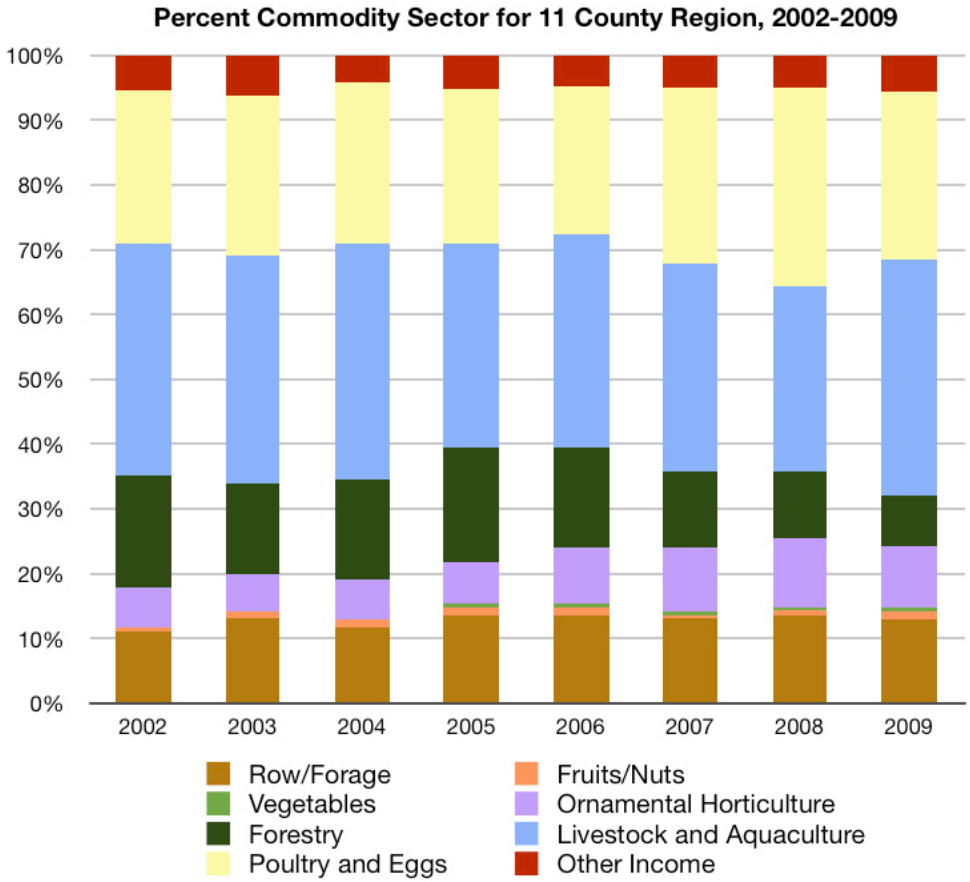


Figure 5.2: Percent Commodity Sector for the 11 county region, 2002-2009. Data source: Georgia Farm Gate Value Reports.

Supporting agriculture.

There are various governmental and non-profit organizations through out the region and state to support agriculture and agriculture-related activities. Among them, the University of Georgia, a land grant university and the flagship high-education institution in state, has a long history and duty of translating relevant academic research findings to pragmatic applications. Established nationally by Congress in 1914, the Cooperative Extension Service at UGA has the mission of "extend lifelong learning to the people of Georgia through unbiased, research-based education in agriculture, the environment, communities, youth and family" (UGA, 2011).

Due to 23% budget reduction during 2008 to 2010, the Cooperative Extension Service has recently had to restructure their service model. The new service model is a tiered system with 6 tiers to reflect the funding and resources available. Tier 1 has no physical cooperative extension office and 4-H is delivered through schools. Tier 2 has an office with one employee and basic lab testing services. Tier 3 has everything Tier 2 has plus an additional agent shared with another county. Tier 4 adds to Tier 3 with a full-time county-based agent. Tier 5 adds to Tier 4 with two or more agents in a county with one serving as the county coordinator. Finally, Tier 6 has everything Tier 5 has plus a full-time coordinator with staff funded through various sources and programming in all three extension program areas (agriculture/natural resources, family and consumer science, and 4-H/youth development). Under this new service model, there are also special area agents in both commodity production (i.e. blueberries, Vidalia onions, and peaches) and grant funded program areas. (UGA, 2010).

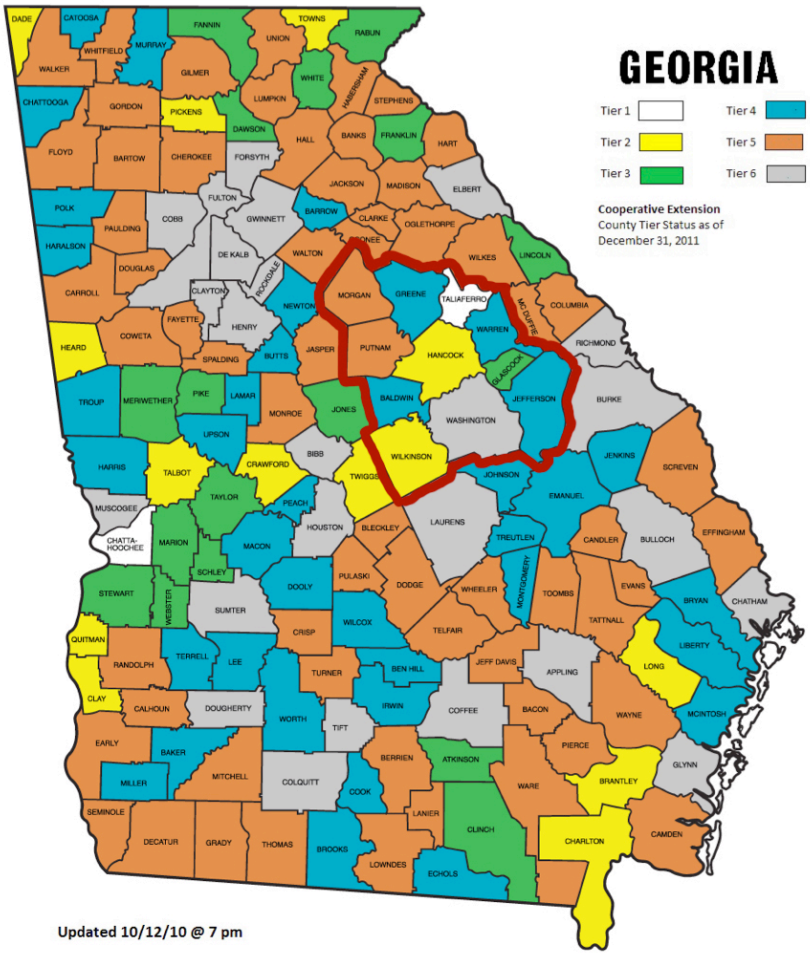


Figure 5.3: Georgia Cooperative Extension Tier Service Map. Source: UGA Cooperative Extension, 2010.

Each county in Georgia is assigned a tier, as shown in Figure 5.3. The study area, outlined in red, has one of the two Tier 1 counties in the entire state. Hancock and Wilkinson are Tier 2 counties. Glascock is a Tier 3 county. Baldwin, Green, Jefferson, and Wilkinson are Tier 4 counties. Morgan and Putnam are Tier 5 counties. Washington is the only Tier 6 county.

Food distribution

The DVRPC developed a Food Freight Analysis Framework (FAF) utilizing data from the Federal Highway Administration. Rather than measuring food miles, the Food FAF measures food leaving a region, which suggests that the remaining food produced in the region is consumed in the region. The Food FAF is a highly sophisticated tool and beyond the level of

analysis needed for this thesis. It is also tailored to telling the story of food distribution into and out of cities with higher traffic volumes than rural areas.

The region, like the entire state, is well served by a dense network of major roads that allow for efficient transportation for goods throughout the region. The interstate system in Georgia is the most significant and differentiated transportation investment in Georgia as shown in the GIS analysis in Figure 4.2. Interstate 20 runs through the Morgan, Greene, Taliaferro, and Warren counties connecting Atlanta to Augusta. The Georgia Department of Transportation is currently constructing the Fall Line Freeway connecting Columbus to Augusta with a 4 lane divided highway. The Fall Line Freeway goes through Wilkinson, Baldwin, Washington, and Jefferson counties (GDOT, 2011). Completion of this highway will increase the connectivity of the study area and two MSAs of Macon and Augusta.

Food economy

In addition to agricultural products sold from farms, the retail sale of food within an area contributes to the food economy of the area. For the 11 county study area, retail sales from food and beverage stores totaled over $271 million in 2008. This is 1.61% of the almost $17 billion in food sales for the entire state of Georgia. Food and beverage stores is any retail location where food is purchased to be consumed at home, which includes grocery stores, convenient stores, gas stations, liquor stores. Taliaferro County had the lowest retail sales with only $706,000 in sales. Morgan County has the highest retail sales with slightly over $49 million in sales.

In addition to food and beverage stores, retail sales at food service and drinking places contribute to the food economy. Food service and drinking places include bars, restaurants, and fast food establishments. Retail sales at food service and drinking places totaled $173 million in 2008 in the study area, representing 1.12% of the $15.4 billion in retail sales statewide.

Glascock County had the lowest retail sales with $754,000 in sales. Baldwin County had the highest retail sales with over $77 million in sales (Donato & Smietana, 2008).

The huge difference in retail food sales at both stores and places can partially accounted for by the different in population between the counties. However, measuring the "pull factor" of retail food sales at food and beverages stores and food service and drinking places provides a better method of comparing retail sales between the counties in the region. Pull factor measures purchases against the entire population of a community. A county with a pull factor of 1 means that the county can account for all the purchases made within the county. If the pull factor is less than one, then county residents are making purchases outside the county. If the pull factor is greater than one, then outside residents are making purchases inside the county. Pull factor is calculated on a statewide basis, so the base assumption is that the pull factor for Georgia as a whole is 1.

Figure 5.12, in addition to showing the distribution of retail sales in the counties, lists the pull factor for each of the county for both food stores and places. All pull factors are calculated by the Center for Agribusiness and Economic Development at the University of Georgia and are accessible online through the Georgia Statistic System[11] (Kriesel, 2011). For food and beverage stores, Taliaferro County also had the lowest pull factor of 0.32 in 2008. This means that approximately 68% of per capita retail food and beverage purchases by residents were made outside of the county. Greene County had the highest pull factor of 2.02 in 2008 for food and beverage stores. This means that over twice the number of purchases were made in the county

[11] Georgia Statistical System website: http://www.georgiastats.uga.edu. Under the "Cross Sectional Analysis" page, each of the 11-counties was selected in step 1. Under step 2, "Economics" variable was selected first, followed by "Retail Sales" variable, and then the pull factors for 2008.

than can be accounted for by county residents. Wilkinson County, with a pull factor of 0.98, is the closest to just meeting the needs of all residents in the county.

For food service and drinking places, Hancock County has the lowest pull factor of 0.11, meaning 89% of per capita purchases are made outside of the county. Baldwin and Morgan Counties are close to a tie for the highest pull factors of 1.28 and 1.27, respectively. People living outside of the county make approximately 25% of retail sales in these counties. Taliaferro County is the closest to just meeting the food service and drinking places needs of its residents.

TABLE 5.12: FOOD ECONOMY	Retail Sales, Food and Beverage Stores, 2008	Retail Sales, Food Service and Drinking Places, 2008	Food and Beverage Stores Pull Factor	Food Service and Drinking Places Pull Factor
Baldwin	$46,007,000	$77,327,000	0.7	1.28
Glascock	$3,141,000	$754,000	0.87	0.23
Greene	$46,701,000	$8,540,000	2.02	0.4
Hancock	$5,256,000	$1,028,000	0.52	0.11
Jefferson	$33,831,000	$12,533,000	1.72	0.7
Morgan	$49,048,000	$36,660,000	1.55	1.27
Putnam	$37,474,000	$13,481,000	1.17	0.46
Taliaferro	$706,000	$2,049,000	0.32	1.03
Warren	$12,266,000	$1,346,000	1.68	0.2
Washington	$24,116,000	$17,310,000	0.89	0.7
Wilkinson	$12,901,000	$2,011,000	0.98	0.17
Region sum	**$271,447,000**	**$173,039,000**		
State Total	**$16,906,709,000**	**$15,448,601,000**		
Region as a percent of State	1.61%	1.12%		

5.12: Regional Food Economy, 2008. Source: Georgia Statistical System (Kriesel, 2011).

In both cases, the counties with pull factors of less than 1.0 might invest in more retail stores and places for county residents to meet their needs within the county, although this might decrease the pull factor of immediately surrounding counties. Counties with a pull factor greater than one might investigate commuter traffic through the county to see if the additional purchases are made by people routinely moving through the county, like for work, or by people making special visits to the county, like for vacation or other tourism activities.

Conclusion

This chapter provides a more detailed picture of where the region has been and is now with regard to the food system. This baseline is important for understanding the opportunities for the region going into the next Chapter.

CHAPTER 6

PLANNING TO GROW: FOOD HUBS AS REGIONAL ECONOMIC DEVELOPMENT TOOL

Using a methodology derived from analyzing existing food hubs and farms with direct-to-consumer sales, Chapter 4 identified a region in which a regional food hub has a high probability of succeeding. Chapter 5 describes this region using a food system survey. This chapter revisits the idea of the agriculture of the middle and also the challenges involved with scaling up the local food system, moving it from a heavy reliance on direct sales to wholesaling to retail outlets and institutions. The opportunities to supply retail outlets and institutions are expanding for mid-scale producers, but some coordination and infrastructure is required for these opportunities to be realized. These expanding opportunities are still very new for mid-scale producers. Few individual farmers, groups of farmers, or organizations supporting farmers have track records of successfully taking advantage of these opportunities and documenting their success. Reviewing the literature, many scholars hope and theorize that local and regional food systems are economically viable for farms (Abate, 2008; Bellows & Hamm, 2001; DeWeerdt, 2009; Gale, 1997; Kane et al., 2010; Martinez et al., 2010), but none have been able to definitely show it is successful.

This chapter addresses these new expanding opportunities, exploring the feasibility of food hub(s) in the 11-county study region in East Central Georgia as a means for providing the necessary coordination and infrastructure.

Agriculture of the Middle

Over the course of several decades, farm production in the United States has moved in one of two directions dependent on market orientation (Lyson, 1986; Lyson, Stevenson, & Welsh, 2008). The first production strategy is to produce non-differentiated commodity crops on larger farms that use capitalization and specialization to leverage economies of scale. These larger farms, representing approximately 10 percent of the farms in the country, supply more than 60 percent of all agricultural commodities in the agricultural economy (Kirschenmann, Stevenson, Buttel, Lyson, & Duffy, 2008) for most of the retail markets across the country and globe.

The commodities supplied by these large farms represent inputs into an industrial food system operating on neo-classical economic principals. Increasingly consolidated multinational firms purchase, process, package, market, distribute, and sell food, thereby controlling decision-making about most of the food system. These firms impose farm management decisions based on profit maximization and prefer to work with only the largest farms that can consistently supply standardized products.

The second production strategy is to produce highly differentiated value-added crops on smaller diversified farms oriented to direct sale markets. These smaller farms produce a very small amount of the total food consumed in this county and work a corresponding small amount of land. These farms are able to operate fairly independently and can make management decisions reflective of individual and community held values about social and ecological concerns.

The farms that exist between the large commodity markets and the small direct sale markets represent the "agriculture of the middle." These farms are too small to leverage

economies of scale to compete in a highly consolidated marketplace; and they are too large too depend solely on direct sale markets. These mid-sized farms represent the largest share of working farms and 80 percent of farmland in the country (Gray, 2009).

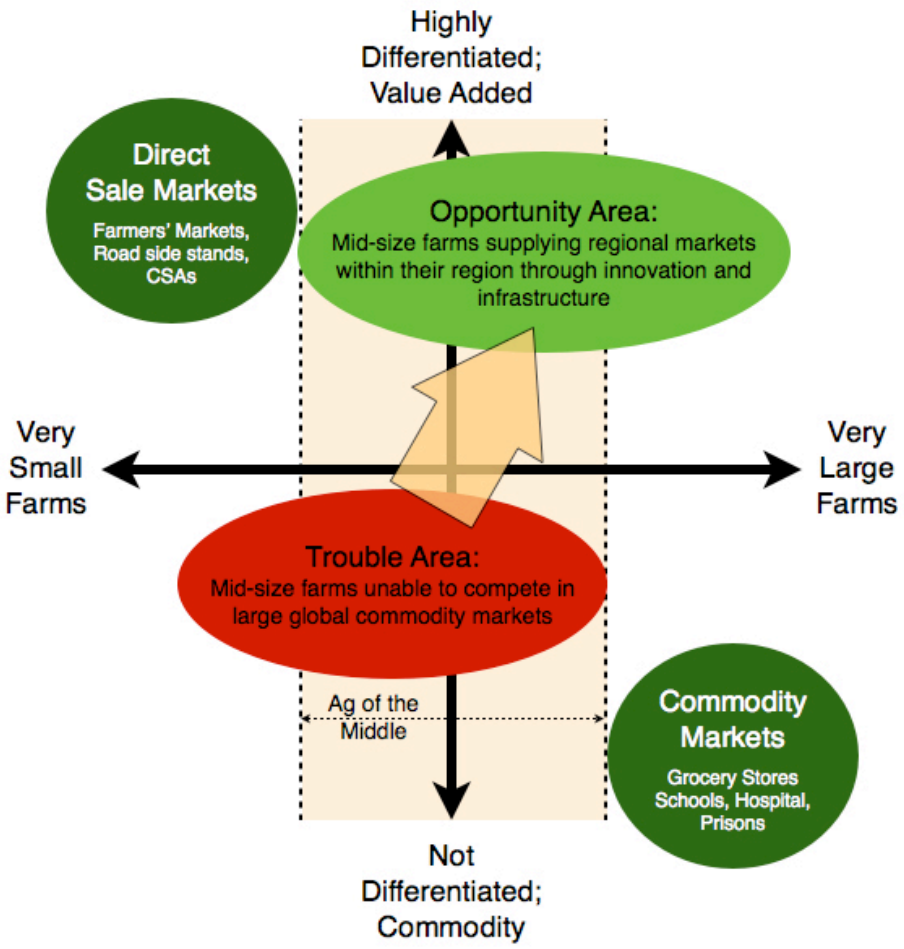


Figure 6.1: Opportunity Areas for Agriculture of the Middle. Derived figure (Gray, 2011).

As Figure 6.1 shows, these mid-size farms currently exist in the trouble area between the economically viable direct sale markets and commodity markets. The opportunity area for the agriculture of the middle is found in choosing not to compete with large farms on production of commodities, but to explore the opportunities available in scaled up production of differentiated value-added products for retail and institutional markets.

Within Georgia, the dynamics of a dual structure of agriculture and the dilemma of the agriculture of the middle can be seen, mirroring the situation on the national level. Farms earning less than $10,000 a year in agricultural sales at the 2007 Census of Agriculture represent 67.7% of all farms in Georgia and account for less than 1.0% of Georgia's agricultural sales. Meanwhile, farms earning $250,000 or more a year in agricultural sales represent just 9.7% of the farms in Georgia but account for 90.3% of Georgia's agricultural sales. The agriculture of the middle in Georgia—those farms making between $10,000 and $250,000 in sales a year—represent 22.9% of farms and account for 8.9% in agricultural sales.

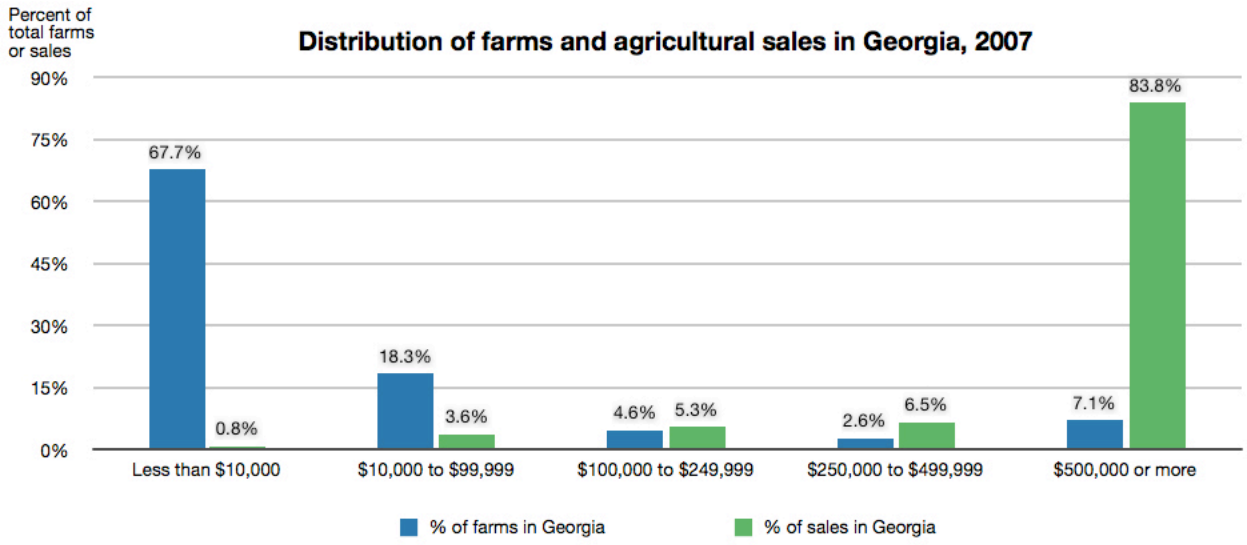


Figure 6.2: Distribution of farms and agricultural sales in Georgia. Data Source: USDA 2007 Census of Agriculture

In the study area, the average farm size ranges from 141 acres in Morgan County to 346 acres in Jefferson County with median farm size from 67 acres to 128 acres. Rather than producing more labor-intensive crops like fruits and vegetables, the region's agricultural production reflects less labor-intensive crops like row/forage, forestry, and pastured livestock. These crops, while still requiring labor and attention, are more amenable to off-farm employment.

Emerging Markets

During the opening session on "Emerging Market Opportunities for Small-scale Producers" in 2009 to the USDA Marketing Services Division, economist James Barham presented in great detail the characteristics of three different scales of agricultural markets, seen in Figure 6.3 (Diamond, Barham, & Tropp, 2009a). The three markets identified by Barham are the mainstream market, farm-to-firm marketing, and farm-to-consumer marketing. Both the mainstream market and the farm-to-consumer market represent markets for the existing dual structure of agriculture that has developed in this county. The farm-to-firm marketing channel is the opportunity area shown in Figure 6.1.

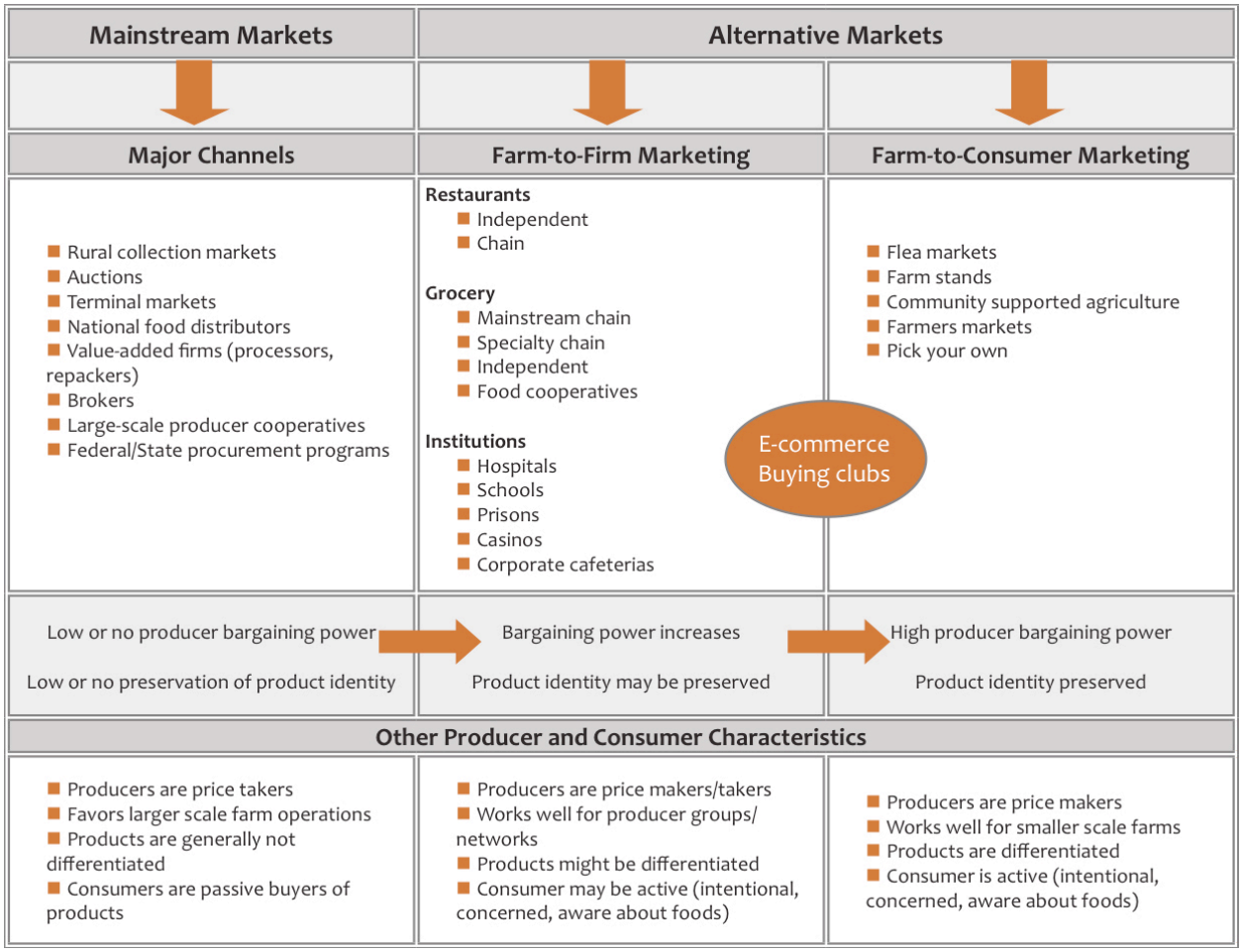


Figure 6.3: Marketing Options for Agricultural Producers, (Diamond, Barham, & Tropp, 2009b)

The potential benefits of farm-to-firm markets are increased bargaining power for producers, larger volume sales than farm-to-consumer markets, and more opportunities for value-added supply chains than are available in mainstream commodity markets.

However, there are challenges in supplying farm-to-firm markets, especially for individual farms. Restaurants want small orders of diversified products of very high quality, with frequent deliveries made during a specific windows of time, requiring highly individualized attention from suppliers. With grocers, overcoming bureaucratic barriers and adhering to special postharvest handling requirements can make it difficult to penetrate the market and make the first sale. Institutions are similarly difficult to make the first sale to because they usually have streamlined operations that favor single vendors who are capable of supplying everything. Many institutions have limited flexibility in purchasing decisions due to budget constraints that make them very sensitive to price and less likely to provide a good profit for farms. All three markets, restaurants, grocers, and institutions, are frequently slow to pay invoices and provide little recourse for farms if they reject a delivery for whatever reason (Diamond et al., 2009a).

Within Georgia, there is a utilization gap between the amount of food consumed in Georgia and the food produced in Georgia. The Center for Agribusiness and Economic Development at UGA estimates that closing this utilization gap for just fruits and vegetables would generate $780 million in revenues for the state each year (Kane et al., 2010). This indicates the degree of opportunities in Georgia for regionally produced food. Food hubs seek to overcome the challenges to entering and maintaining farm-to-firm market channels.

Recommendations for East Central Georgia

Before beginning to make recommendations, I acknowledge that specific recommendations reflect personal biases. This thesis was researched and written as a test case

and feasibility study from a privileged academic perspective using publically available data sources to inform the process. Some informal conversation with a few knowledgeable individuals, guided the direction of the thesis towards resources that helped to confirm certain hunches it was based upon. Decisions about the planning and organization of any collaborative agricultural ventures in the 11 county study area in East Central Georgia should be made in a diplomatic and democratic matter by all interested stakeholders. Decisions should also reflect the community values and goals with an eye to sustainability that can be manifest in the configuration of the regional food system as discussed in Chapter 2.

Chapter 4 identified this 11 county region in East Central Georgia for food hubs based on criteria from existing successful food hubs and local food system research. As such, each component for a food hub is already potentially in place.

Farms.

While volume aggregation is key to food hubs, the diversity, quality, consistency, and seasonal availability of products is essential to consider (Abate, 2008; Day-Farnsworth et al., 2009; Flaccavento, 2009). Product diversity and seasonal availability can be achieved on-farm or between multiple farms or both. Certain farms might have an advantage at growing certain crops over other crops and/or farms. Seasonal availability can also be accomplished both on-farm or between multiple farms. Early plantings and late plantings of crops should be considered as well as season extension technologies, like hoop houses and greenhouses. Investments in season extension technologies can be spread across several farms to help increase seasonal availability.

Quality and consistency should be addressed on-farm as well as at the processor/aggregator. Farmers should understand the basic market product demands and be

realistic about the price they will receive for their products. The highest quality produce, the "number ones," will fetch a higher price then lower quality produce, the "number twos" or seconds. Farmers who are aware of the quality classifications can pre-sort their produce in the field saving time and money before they reach the processor/aggregators. In field quality can also include picking produce before the heat of the day raises internal temperatures or making sure that field heat is removed quickly from food on-farm or at the processor/aggregator facility.

The criteria indicators used in Chapter 4 address several aspects of farms and farmland already, like existing farmland not threaten by development pressure and with some farms oriented to local markets. The area chosen has a large number of existing farms with 2,711 farms covering more than 575,000 acres. There are also 94 farms with direct farm-to-consumer sales in the region. These farms are potential stakeholders in developing a regional food hub as they might be interested in scaling up production for farm-to-firm sales.

From the food system survey in Chapter 5, the 11 county study area is not collectively growing fruits/nuts or vegetables on very many acres. For example, the entire area grew vegetables on 1,758 acres in 2009 according to FGVRs, representing approximately 1.3% of harvested cropland[12]. More than half of the total acreage in vegetables and the most crop diversity are in Hancock County, which has 915 acres in vegetables. Most of the fruit/nut produced in the region comes from established pecan groves rather than annual fruit production or other tree fruit. If the region is interested in supplying markets with fresh fruits and vegetables, more acres should be dedicated to doing so.

[12] Harvested cropland acreage is taken from the 2007 Census of Agriculture so the actual percentage might be off and then harvested cropland accounted for just 23.6% of total farmland in the region.

While the region falls behind in fruit and vegetable production, livestock production in the region is extremely robust. As mentioned in the food system survey, Morgan and Putnam Counties are frequently in the top five, if not first, producers of livestock in the entire state. Collectively, the region produced 5,815 head of beef cattle for finishing outside of their counties, 60,700 head of beef cows, and 10,140 head of beef stockers. In terms of creating a regional market, livestock might be a place to start.

Infrastructure.

The physical infrastructure of a food hub varies based on need: small scale slaughter houses for livestock, dairies and creameries for dairy, shared used certified commercial kitchens for value-added production, and produce packaging for fruits and vegetables. Equipment is also specific to need which is determined both by the products and the markets. For produce, for example, equipment is needed to wash, grade, minimally process, cool, possibly freeze, and package the product (Flaccavento, 2009). Hub infrastructure should be located relatively close to the majority of farms but also strategically placed within the region for efficient transportation routes or to take advantage of traffic patterns.

The strategic location of the hub becomes even more critical when thinking about including a distribution fleet as part of a food hub's infrastructure. The distance traveled, fuel used, and labor required for transportation are all variable costs that should be considered as distribution investments. Routes should be mapped out for shortest time and distance. Orders should be consolidated to ensure that the fewest trips possible are required. When possible, trucks should backhaul products for other companies so the truck is never empty.

Infrastructure investments represent the larger fixed cost purchases for a food hub. Time should be taken to see if there are opportunities for adaptive reuse of existing facilities before

investments in a brand new facility are considered. The same goes for equipment. Finding used equipment can save tremendously on the upfront costs of starting a regional food hub.

For a food hub in East Central Georgia, the region might consider a small-scale slaughterhouse capable of beef, pork, and goat processing, producing standard cuts and specialty cuts, and also a produce processing facility. For a food hub in East Central Georgia, the region might consider a small-scale slaughterhouse capable of beef, pork, and goat processing both standard cuts and specialty cuts as well as a produce processing facility.

In Chapters 4 and 5, the region has an identified transportation advantage with the interstate system running through the area and connecting two metropolitan markets. The ideal location for such a facility might be along Interstate 20, providing efficient access to the markets of Atlanta and Augusta. The food hub could also be located on a major state road leading to Athens, possibly at the intersection of highway 441, 15, or 77.

The volume of traffic along Interstate 20 represents another opportunity. The food hub can have a storefront permitting retail sales on site. Signage could be acquired through Georgia's Agritourism Program initiated by the Georgia Department of Agriculture in cooperation with the Georgia Department of Transportation and the Georgia Department of Economic Development (GADA, 2011). Highly visible signage would encourage traffic to stop and shop at the food hub as well as increase brand familiarity with traffic moving between two of the markets the food hub might serve.

Management.

There are many decisions to be made about management of a food hub at different levels. Decisions about the organization and structure of the food hub should include a discussion about sustainability. The initial decisions affect the economic security, environmental integrity and

democracy and the future capacity of the region to continue making sustainable decisions based on the five capitals.

The first decision is whether the food hub is going to exist as a collection of separate, collaborating component parts or if the food hub will be an entire organization between the farms and the markets. A food hub model with collaborating parts could include a facility managed independently from a distribution company, which exists separately from one or more growers or grower cooperatives using the food hub. In contrast, a food hub organized as a single entity could perform all of these functions. Because it would be too complicated to do otherwise, the thesis will discuss management of a food hub as the entire organization between the farms and markets with the understanding that there are numerous other configurations and relationships between components of a food hub organized differently.

The legal organization and driving force behind the food hub is the next consideration. The legal organization options are sole proprietorship, partnership, for-profit corporation (including Limited Liability Corporation), and non-profit corporation. As mentioned previously, markets can be retail-driven, non-profit driven, producer-driven, or consumer-driven (Bragg & Barham, 2010). Each organizational model comes with pros and cons although most existing food hubs are non-profit driven or producer-driven.

There are also management issues within the food hub itself that must be considered. There should be effective communication, transparency, trust, and free flow of information between all stakeholders (Day-Farnsworth et al., 2009). There should be strong cooperation among farmers to plan plantings and harvests to meet market demands, namely product diversity, quality, consistency, and availability. Food hubs should actively engage large and small customers, confirm expectations and then meet or exceed them.

Marketing and Markets.

Chapter 2 discusses the various configurations of our food system and the implications of these various configurations. Consumer purchasing decisions are value laden. Marketing decisions should address consumer concerns. For some consumers, knowing that their food is locally grown is enough. Other consumers want to know where it was grown while others want to know how. There are many, various markets to be tapped in Georgia. These markets occur at different scales creating different opportunities for a food hub based on scale of aggregation from participating farmers. Each of these markets also has different capacities for communicating value chains.

Starting out, restaurants and independent grocers provide a testing ground for smaller scale deliveries although they will not move large volumes of produce. Small regional grocery store chains, like Bi-Lo, Food Lion, Ingles, Publix, and Winn Dixie, provide the next tier of firms for a regional food hub. Specialty grocery stores and ethnic markets exist on the same tier as regional grocery stores and more intimately understand the need for maintaining value chains, as it is a cornerstone of their own marketing practices.

The next tier is institutions, like universities and hospitals, and national restaurant chains. Universities and hospitals, if they are not under contract, have a degree of flexibility in purchasing because they can pass some costs on to their consumers. In some cases, like Emory University, these institutions set local food procurement goals, creating a market to be filled (Emory, 2011). The most difficult market tier for food hubs to supply is institutions with little flexibility in their budgets, like schools and prisons.

As a food hub moves up the tiers, product volume demand increases while product differentiation and specialization decreases. The food hub must make the decision about what its

ideal market might look like and tailor production and branding to match those needs. For example, if a food hub wishes to focus on providing product to restaurants, the value chain from the farm to the restaurant should maintain the distinct name of the farm that produced each product so that the restaurant can put the name of the farm on their menu. Conversely, if a food hub wishes to focus on providing products to grocery stores, an overarching brand communicating the values of the food hub organization might be a more appropriate value chain when products from many farmers are combined.

In Georgia, smaller direct sale farmers are building their capacity to supply restaurants (i.e. the first tier of farm-to-firm marketing). Therefore, the opportunity for a regional food hub lies with the next tiers, different grocers and institutions. These are the markets where the majority of Georgians purchase their food.

Capitalization and Incentives.

Finding money to finance a regional food hub or any rural economic development venture is extremely difficult. There are different funding streams such as grants and low interests loans from the USDA, especially under the Know Your Farmer, Know Your Food initiative (USDA, 2011).

Three funding sources through the Agricultural Marketing Service (AMS) are the Farmers Market Promotion Program (FMPP), the Federal-State Marketing Improvement Program (FSMIP), and Specialty Crop Block Grants (SCBG). The FMPP can be applied for by non-profits and/or businesses working with multiple farmers on increasing direct-to-consumer sales. If the region hub were to include retail space for consumers to buy direct, much like they would at a roadside farm state, the food hub would be eligible under this program. The FSMIP and SCBG are both grants awarded to the State Departments of Agriculture only, but the State

Department of Agriculture's can chose to re-grant funds to local organizations based on the state's priorities. The FSMIP could be used to market analysis for regional food hubs within the state, while the SCBG could be used to created farm-to-firm marketing campaigns.

There are seven programs under the Rural Development Agency geared towards increasing local and regional food systems that the 11-county study area is eligible for as the USDA classifies all the counties in the study region as rural. Many of the programs under the Rural Development Agency are also geared to economically disadvantaged or traditionally underserved communities of which there are several in the study area. The Rural Development program emphasis training and technical assistance, guaranteed loan programs, planning, and grants for capital projects. The Rural Cooperative Development grant might be of particular interest to the study region for starting a regional food hub as it helped an identified regional food hub, the New North Florida Farmers Cooperative, to establish facilitates for value-added processing and farm-to-school marketing (Bragg & Barham, 2010). Only non-profit cooperatives are eligible for this grant funding. Other Rural Development programs of interest include the Community Facilities Program, which provides loans and grants for securing and equipping facilities (only non-profits are eligible), and the Value-Added Producer Grants, which provides for planning and working capital to producers to secure a higher portion of the retail food dollar (only producers or producer-control organizations are eligible).

One other USDA agency, the National Institute of Food and Agriculture (NIFA), provides Community Food Project (CFP) grants to fund proactive approaches which make communities more self-reliant and controlling more of their own local food system. This program is also only available for non-profit organizations looking to carry out multipurpose project.

Brian Dabson, president and CEO of the Rural Policy Research Institute (RURPI), argues the need to "invest in entrepreneurship development in a rural context, particularly to help communities and micropolitan regions become[s] more supportive of entrepreneurs and innovation" (Dabson, 2009, p. 109). Food hubs foster opportunities in an agricultural economy for a number of entrepreneurs who would not have had the opportunity otherwise due to large structural issues.

In addition to securing outside financial support, incentives can be used to help a food hub, or any community food enterprise, save on tax expenses. There is a range of tools available to individual communities and to the state to encourage specific business venues. The current economic development incentives in place need to be reviewed to make sure that agriculture and community food venues are explicitly included. If not, the incentives should be revised or new ones should be put in place.

Planning and Institutional Support.

Beyond financial support, public and institutional support is required for regional food hubs to work. The study area in East Central Georgia encompasses 40 small towns, 11 counties, and 3 regional planning jurisdictions. This work does not fit neatly into any particular jurisdictional framework currently available and might require thinking beyond these traditional jurisdictional limits (Born & Purcell, 2006).

All the counties' and regional commissions' comprehensive plans recognize the historical significance of agriculture in the region, acknowledge the individuals still engaged in agriculture, and respect the contributions of agriculture to their economies. Across the board, however, agriculture is overlooked as an economic development opportunity for the future. All economic development plans in the region hope for manufacturing and tourism.

The opportunities for renewing the agriculture of the middle, through food hubs and other community food enterprises, are greater than they have been in the last 70 years. These opportunities need to be considered by communities as they are looking to the future. Including support for food hubs in comprehensive plans, in current economic development strategies, in chambers of commerce, and in tourism literature, sends a message throughout the community and beyond that the community is proud of its agricultural past, present, and future. In the long run, a new, younger generation of farmers will be encouraged by this support and with it see a career and future in farming and the agricultural economy.

Additional institutional support for food hubs can come from two places it has traditionally come from: the Cooperative Extension Service and Departments of Agriculture. A special position could also be created through the Cooperative Extension Service to coordinate activity between regional agricultural stakeholders and the various decision-making entities in the area.

Ideally, a joint position, through the Georgia Department of Agriculture and the Georgia Department of Economic Development, could be created, employing a regional planner focused on the economic development opportunities for regional agricultural projects in rural regions. The USDA could also begin hiring planning professionals to work within various departments to aid in long range planning, public participation processes, and to encourage cooperation across jurisdictional boundaries and scales.

CHAPTER 7

CONCLUSION: OPPORTUNITIES FOR RESEARCH AND ORGANIZING

Food system planning is a bridge connecting economic development plans to the renewal of the agriculture of the middle. A recent report from the Center for Agribusiness and Economic Development at the University of Georgia found that "if each of the approximately 3.7 million households in the State devoted $10 per week of their total food dollars to purchasing Georgia grown products–from any source, not just directly from producers–it could provide over $1.9 billion food dollars reinvested back into the state" (Kane et al., 2010, p. 2). Many farms in South Georgia are growing products for mainstream industrial markets. When the food is harvested and taken off farm, it is removed from the region, only incidentally turning up in Georgia firms when it makes financial sense. Food hubs, as described in this thesis, create intentional regional markets where food produced in a region remains in a region. Food hubs are the step needed to allow local agriculture to make a $1.9 billion reinvestment in Georgia's economy.

Opportunities for additional research

In Chapter 4, the thesis developed a methodology for identifying regions where food hubs have the potential to be a viable economic development strategy for communities. This methodology answers the call from the USDA to "identify examples of food hubs in existence, development, planning, or under consideration (with or without USDA support)" (Bragg & Barham, 2010). The methodology was developed in Georgia but may have national applicability. An analysis model needs to be run testing this methodology in other parts of the country to see if the methodology can predict the existing food hubs identified in the literature

before it can be used to predict potential food hubs. After any necessary refinement in the criteria, indicators or weighting, this methodology could be used to direct future funding to regions with characteristics favorable to food hubs.

Another opportunity for further research exists around conducting market feasibility studies for assessing appropriate farm-to-firm markets for regional food hubs to supply. Surveys of restaurants, food co-ops, specialty grocers, independent grocers, regional chain grocers and institutions (i.e. schools, universities, hospitals, and prisons) throughout Georgia would help establish which markets are best to begin in, based on the scale of products produced by farms and seasonal availability. Survey questions, outlined by Anthony Flaccavento (2009) should include: What products are they already using? Are they interested in purchasing locally grown foods from regional growers? If so, what value-added qualities are they looking for, just locally grown or Certified Organic or other qualities? What are the minimum and maximum quantities of what types of produces they can handle at various times in the season and what are the required quality standards? And, importantly, what prices are they willing to pay for locally grown produce?

Community Action Steps

Returning to the definition of sustainability from Chapter 2, sustainability is about increasing the capacity for a community to make decisions about how to create, use, and improve its various natural, human, human-created, social, and cultural capitals. The thesis has presented a methodology, identified an area, described the area, and made recommendations for an area. This process has largely consisted of compiling and interpreting publically available quantitative data about a region without any social and cultural engagement with the region. Restated, the

region was identified and described mainly by the condition of its natural, human, and human-created capitals.

The social and cultural capital of the region is extremely underrepresented, even though the success of any collaborative endeavor will require large reservoirs of both. This is the role that community leaders and activists must play to realize goals of a regional food hub or any other cooperative project. As they continue to have conversations with their friends, neighbors, and elected officials, they lead the way and shape a future for their homes and communities.

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