WEALTH AND DEPRIVATION IN THE DELTA:
A LANDSCAPE OF SUBSIDIZATION

A Dissertation

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ABSTRACT

The Mississippi Delta, as defined by the Delta Regional Authority (DRA), is an area of historical and present deprivation. Persistent poverty, lackluster economic development opportunities, and the associated ills of this environment exist alongside large-scale, subsidized agriculture. These federal subsidy payments are criticized for increasing the wealth of corporate enterprises rather than stabilizing the family farmer for whom they were created. This dissertation examines the geography of agristructure, subsidies, and socio-economic characteristics in the Delta with the purpose of identifying spatial relationships among these three variables. Drawing from the Goldschmidt Hypothesis, this research proposes that areas of large-scale agristructure will also be areas of high subsidy income and of poor community well-being as measured by social and economic indicators. Local Indicators of Spatial Autocorrelation (LISA) are employed with correlation and interviews in order to identify the patterns of deprivation associated with agriculture and to understand variation in this geography within the region. With this information, hopefully policymakers will recognize the inefficiency wrought from the traditional “one-size-fits-all” approach to economic development in the region. The Delta will not effectively move forward without acknowledgement of agriculture’s role in both its wealth and deprivation and of understanding the region’s true diversity.
CHAPTER 1 - INTRODUCTION

Background to the Research Problem

After the 1970s commodity price boom and farmland price inflation, agricultural news in the 1980s included gloomier accounts of farm crises, family farm foreclosures, and Farm Aid concerts. To help American farmers through this difficult financial time, Congress initiated agricultural subsidies through the 1985 Farm Bill. This legislation focused less on commodity price support and more on farm income support, with direct payments made to farmers based on planted acreage. Since that time, the federal treasury has spent billions of tax dollars to support particular agricultural enterprises, such as peanuts, rice, and cotton to name just a few. Farmers have grown dependent on these payments and meanwhile a new type of news story has emerged. Satisfied by the federal dole, American farmers cling to their government aid, but farmers in developing countries cry out. They claim the generous subsidies the U.S. provides its farmers flood the market with inexpensive cotton, thus harming their chances to prosper in the world agricultural market. Due to the prevalence of subsidies, financial survival is linked to access to federal dollars for income support in the U.S. Allocation of subsidies is based on farm size and encourages ever increasing acreage to increase efficiency, which then yields more subsidies. The result is an oversupply of subsidized commodities and an associated price decline. Therefore, farmers in developing countries receive low prices for their crop, such as cotton, while American farmers are receiving the same price plus a payment from the U.S. government to continue to make farming worth their while.

Another group of people is harmed by these subsidies, but they are not in a developing country and their link with subsidies is less visible, though nonetheless present. In the United States, the Mississippi Delta has long been described as “the
poorest section of the poorest state, so poor that it is often labeled ‘America’s Third World’” (Lord 1990; 29). The region has some of the richest soils in America, but some of its poorest people. Its historical and continuing dominance by large-scale agriculture has shaped its land and its people. In many ways, the long-standing presence of this type of agriculture is observable; remnant cropper shacks, plantation place names, Blues, and folk art. In other ways, though, the region’s connection to large-scale agriculture is less obvious. For instance, the socio-economic problems plaguing the region may also be associated with large farms. Subsidies add fuel to this fire by encouraging large-scale farming and thus perpetuate the Delta’s infamous poverty. This research asserts that deprivation has a distinct geography in the region; it is the geography of agricultural wealth. Where large-scale agriculture exists, one can expect to find millions of dollars in farm subsidy income. Likewise, poor populations reside in the same areas, placing high levels of transfer payments to both the poor and to the rich in a similar geography of disparate conditions in the Delta.

Identifying and analyzing the spatial patterns of large-scale agriculture, farm subsidy income, and poor socio-economic characteristics in the Mississippi Delta is the aim of this dissertation. This research is undertaken with the purpose of understanding the role of agriculture and subsidies on rural communities in the region and identifying the resultant landscape of subsidization, an area wherein the U.S. government subsidizes both the main economic activity, providing wealth to those who own the large agricultural operations while also supporting the subsistence of the poor who fall prey to the negative ramifications of this endeavor. This research hopes to contribute a greater understanding of the processes that entrench persistent poverty alongside agricultural wealth.
In order to understand the relationship between socio-economic conditions in the Delta, agriculture, and agricultural subsidies, it is necessary to review the background of the relationship between society and agriculture, specifically agricultural structure and rural communities; how the history of the Delta has influenced the current structure, the socioeconomic characteristics of the region, and how subsidies interact with this particular place.

The Relationship between Society and Agriculture

Society and agriculture are interdependent. Whether subsistence or market-oriented, agriculture serves the earth’s population. Focusing on capitalist societies, a more specific relationship exists between large-scale agricultural production and the rural areas where it takes place. As agriculture in the United States has shifted from the family farm to a corporate endeavor, the number of farms and the number of farmers has declined. Advances in technology, such as machinery, chemicals, and genetically modified seeds, have created an inverse relationship between farm acreage and crop yields. Even as fewer acres are available for farming, each acre yields more than in the past. Furthermore, society’s dependence on agricultural products has not waned, and indeed as population has grown total demand has increased dependence on a relatively small number of producers.

With production controlled by few farmers, power in agricultural production is concentrated. In addition, lobbyists actively represent agribusinesses and corporate farmers to the government. Naturally, these advocates seek to benefit their employers by influencing government policy in their favor.

Ronald Wimberley (1993) outlines three types of agricultural policy. Type I is concerned with “sustainability of society,” or making sure that the supply of food and
fiber is adequate for sustained consumer demand. Type II deals with provisions for the agricultural sector. “This specialized agricultural sector policy is primarily for the direct benefit of farm suppliers, farmers, farm workers, processors, and distributors. Whether their sector interests benefit or cost the larger society is a secondary concern from the standpoint of Type II policy” (Wimberley 1993; 6). Finally, Type III policy focuses on issues of rural society and sustaining rural places. Type I policies deal with protecting the food and fiber supply for a large population and Type II policies represent the mostly large affluent farming concerns, so it is no surprise that subjects covered by Type III policies run a distant third to issues of protection and profit. In effect, policymakers can understandably overlook rural places and populations in the face of more momentous problems addressed in Type I and Type II policies.

Though rural policy is often a component of agricultural policy, the two are not one in the same. “Historically, agricultural policy is often regarded as rural policy. Although rural policies may be written into farm bills, we should realize that rural policies differ from agricultural policies” (Wimberley 1993; 6). In the end, agricultural policy promotes the interests of the agriculturally powerful. This difference is no more evident than in the area of economic dominance. The abundance of funding makes agricultural policy more influential. With groups such as Monsanto, the National Cotton Council, and Dunavant investing more than $2 million a year in lobbying efforts, corporate interests easily overwhelm those seeking to enact policy for rural society.

The primary legislation that addresses both components of agriculture and rural development is the Farm Bill. Approximately every five years this recurring legislation sets standards for commodity support programs (crop subsidies) and for rural development, public policy arenas whose interests may be at odds. This potentially
contradictory relationship is central to the research at hand. Wimberley (1993) comments that

the robustness of today’s agriculture against natural conditions is due to the scientific research and development of plant and animal genetics, plant and animal health, pest control, soil fertility, and engineering. Similarly, social research on agriculture is needed to help reduce the social risks of food and fiber production and to improve agricultural sustainability for the farm and nonfarm public. (Wimberley 1993; 8)

One aspect of social research concerning agriculture is its impact on the rural areas where it is practiced. Ronald Knutson and his colleagues (1986) identify factors that affect rural communities as: proximity to urban centers, economies of rural community and business size, and farm structure (Knutson et al. 1986; 5-7). Farm structure, as influenced by government subsidies, is the focus of this research.

“Sociological studies of economic conditions and the quality of life have led to the conclusion that industrialized agriculture is associated with increased rural poverty, substandard living conditions, and a breakdown of social linkages needed to solve rural problems” (Knutson et al.; 9). Furthermore, Janet Kodras (1997) identifies market and state forces as influential in creating a degraded society. “The state has a secondary effect on inequality and poverty, either reinforcing or countering the market tendency toward uneven distribution, through the tax system and other policies and subsidies that grant advantage to certain sectors and populations” (Kodras 1997; 68).

A key characteristic of these sectors and populations, yet one that is often overlooked, is geography. Regarding subsidy programs, Max Pfieffer and Jess Gilbert (1989) cite the following:

For example, corn and feed grain producers participating in the programs have relatively small operations in contrast to cotton producers. Given those differences, farm programs may have widely varying impacts on local farming
communities, depending on the type of farm organization characteristic of the area. (Pfeiffer and Gilbert 1989; 554)

Furthermore, “Farm organization is characterized by marked regional differences attributable to the particular history of each area” (Pfeiffer and Gilbert 1989; 554). Therefore, in order to understand the structure of agriculture in the Delta and its relationship to regional well-being, some salient aspects of its history must be explained.

History of Agriculture in the Delta

For the purpose of this dissertation, the salient characteristics of the Delta’s history fall into several categories that provide context for the present agricultural structure or “agristructure” and its associated attributes: initial European settlement of the area, plantation system prevalence, cotton culture, and the continuing development of corporate/ large scale agriculture in the region.

The history of farming in the Delta is one of nutrient rich soil and plantation agriculture. The dark alluvial soils transported into the Delta by the Mississippi River provide some of the most fertile agricultural land in the country, especially for cotton. The presence of highly productive arable land gained the attention of British businessmen during the middle and late 1800s when they sought more land to provide high quality cotton for their growing textile companies.

Though Spanish, French, and British explorers and traders made contact with the region from the 1500s through the 1700s, the European settlement of the region occurred relatively late due to the presence of Native Americans and the perception that the land would be too difficult to transform into a usable form. Choctaw, Chickasaw, Natchez, Tunica, and Yazoo tribes were a few of the dominant groups that pre-existed the European settlement and eventually fell prey to U.S. treaties, wars, and disease (Saikku
Following the Trail of Tears, plantations and towns began to spring up along the Mississippi Delta’s rivers.” (Woods 1998; 45) The government succeeded in the removal of indigenous populations, surveyed and distributed land to the new landowners using the township and range cadastral method, and these entrepreneurs drained the swamps. However, during settlement in the middle and late nineteenth century, even after adequate drainage and timber removal, flooding proved to be an environmental risk. The floods that delivered rich alluvium also brought destruction as the waters inundated the fields and settlements. Floods were the lifeblood of the soils and hence the economy of the area, but they were a bittersweet occurrence because as they brought rich alluvial soil, they also brought destruction and hardship. “The period after the waters fell was considered the most dangerous part of any overflow. Mosquitoes, horseflies, and buffalo gnats flourished, as did malaria, dysentery, and various other diseases that affected both humans and livestock” (Cobb 1992; 127-128). Nevertheless, the resulting physiography yielded a region of nutrient-rich earth ripe for large-scale agriculture, the plantation. Even today the historically large tracts are a defining characteristic of the area; the average farm size for the region is substantially larger than for most of the country. Indeed, expansive landholdings were the genesis of large-scale cotton farming in the Delta and the specific farm structure that is central to this production method.

The South’s distinctiveness lay not only in what its fields produced but also in how production was carried out. The entire agricultural system, from land acquisition to labor supply, differed from that of the remainder of the nation. The most outstanding trait was a strong dependence upon slaves for labor, but also notable was the tendency toward large landholdings. Although neither was universal throughout the area, both were common enough for the “slave plantation” label to become widely accepted. (Hilliard 1984; 1)
By the late 1830s European settlers had removed Native Americans. Over the next thirty years demand from the textile industry led the area’s farmers to establish a dependence on a mono-cropping system that focused around a specific crop season. Consequently, a crop culture developed that shaped the lives of the people. This crop culture was manifest through the large African American population inhabiting the areas around plantations, the small rural churches that developed on this farmland, the daily focus of life upon labor, and the expression of this livelihood in art.

Metaphors from cotton's production are woven into the fabric of much modern music. It has been a recurring theme in blues and jazz, from New Orleans to Harlem. Leadbelly sang of the "Cotton fields back home" and his intention to "Jump down, turn around, pick a bale of cotton." Duke Ellington led the Cotton Club Orchestra. More recently, in Brook Benton's "The Boll Weevil Song", the nasty little pest of the title tells a farmer that, "When I'm through with your cotton, you can't even buy gasoline," evidently unaware of all those subsidies. (Economist 2003; 43)

However, as the crop itself went through changes and as the mode of production changed as well, the human component to the process waned in importance in the face of mechanization and technological progress. Agriculture became “reconfigured into a machine culture that relied upon federal programs to maintain its structure. The change in the mode of production, in social organization, and in the nature of rural life proved the most revolutionary in southern history” (Daniel 1985; 239).

Market-induced dependence on monoculture cotton is a part of the genesis of a regional cotton culture, but other factors have become important to the continuation of the existing agristructure. “Government commodity programs, vertical contracts with processors, highly specialized capital investments, and loan agreements with banks mitigate against on-farm diversification in the United States” (Sachs 1996; 149). In order to reap the most benefits from the crop and its subsidies, farms have grown larger while
concurrently becoming more vested in machinery and technology. The result is large-scale agriculture that is run more like a corporation rather than the traditional idea of a family farm.

Social, Economic, and Environmental Conditions in the Delta

Rural deprivation is a byproduct of the evolution of large-scale agriculture. The Delta presents its residents with job shortages, lackluster educational opportunities, economic development challenges, persistent health concerns and environmental problems. A driving force behind these challenges is land use, specifically large-scale cotton farming.

“Unemployment rates in Delta counties are generally higher than elsewhere in the state. For example, Sharkey County's February jobless rate was 18.2 percent [2003], the highest in Mississippi” (Volz 2003) and “It seems every other fast food restaurant, gas station and clothing store is boarded up, wires hang from broken store signs and in some neighborhoods, wooden porches are crumbling” (Nelson 2003). As agriculture has become less of an economic provider for the rural population, localities have tried attracting industries to take up the employment slack.

Some rural areas did successfully attract industry, but the results were not impressive – primarily low-wage jobs and higher tax burdens for rural residents. One-half of the industrial and manufacturing jobs established in U.S. rural communities from 1980 to 1990 paid below poverty wages and failed to provide medical benefits. (Sachs 1996; 170)

The Delta also has “some of the nation's most impoverished public schools” (Nelson 2003). In addition, the 2000 census reports “Sunflower County, with a population of 33,900, is among the poorest in the state. Per capita income is $11,356, $4,488 below the state's [average]. It's not uncommon for eight or nine out of every ten students in public
schools here to have family incomes low enough that they qualify for free lunch” (Branson 2002; B1).

Such economic hardship is explained, at least in part, by the cotton culture and plantation mentality that pervades into the twenty-first century. For example, a second grade teacher with Teach for America stated that, “there's something about driving down Highway 61 and seeing the cotton fields. You can see here how that history has affected our present” (Nelson 2003). Furthermore, in an interview, one of the creators of “Lalee’s Kin: the Legacy of Cotton,” an academy-award nominated documentary about the Delta, stated that residents there “wanted us to come and film their situation because they wanted people in America to see that this is a Third World country in the Mississippi Delta” (Simeone 2002).

Health is also problematic in the Delta, both in service delivery and in quality. According to the Centers for Disease Control in conjunction with the Food and Drug Administration,

There's an epidemic of diabetes infecting families in the rural homes and villages of Mississippi's Delta, brought on in large part by fat, flour, and the frying pan. Other factors adding to the Southern dietary favorites… are the region's sedentary lifestyle and incomes that many times put healthy foods out of reach” (U.S. Centers for Disease Control (USCDC) and U.S. Food and Drug Administration (USFDA) 2003; 32)

Dr. Scott Nelson, a family practice physician in Cleveland, Mississippi said, “It's no coincidence that our Delta counties are among the most sedentary and among the most overweight in the nation. Hence, that would tie into the reason why we see so many type 2 diabetics” (USCDC and USFDA 2003; 32). Another physician, Dr. Christopher D. Saudek, director of the Johns Hopkins Comprehensive Diabetes Center and past president of the American Diabetes Association stated, “poverty, particularly in the Delta, also
could be a factor in the diabetes crisis” (USCDC and USFDA 2003; 32). Diabetes, though, is only one of several poverty-related plagues in the region. It also faces high stroke, cancer, and infant mortality rates.

In addition to health problems, environmental issues related to agriculture exist in the region.

from databases in several federal and state health and environmental agencies, it is known that the Region's environmental hazards include the spectrum of non-point environmental problems such as mercury contamination in some states' surface waters, pesticide runoff in agricultural areas, seasonal degradation of ambient air quality, vector control, and the environmental and health consequences of natural disasters. Point-source environmental problems include releases of toxic substances from waste sites, lead-based paint in older housing, hazardous materials handling, chemical spills and explosions, and inadequate municipal waste treatment capacity. (USASTDR 2002; 2)

Along with the Agency for Toxic Substances and Disease Registry (ASTDR), the USDA’s (United States Department of Agriculture) National Agricultural Statistics Service (NASS) provides environmental data associated with agriculture thereby making possible the spatial analysis of the agricultural-environmental situation in the Delta where run-off and water depletion, both from agriculture and attempts at economic development, are problematic.

The problem with water in this area is that when the catfish ponds and rice fields aren't draining the ground dry, torrential runoff often is pouring from new developments in Tunica and DeSoto counties and inundating farms and homes downstream. But even when there's no flooding, even when supplies are adequate, a different kind of water problem persists across the basin of the Coldwater River. Many of the local bayous, lakes and streams are fouled with silt, farm chemicals and sewage pollution. (Charlier 2003; A1)

Fertilizer also presents environmental challenges. “Continuous monoculture or short rotations make soils more susceptible to erosion and also contribute to a decline in soil organic matter and nutrients” (Sachs 1996; 59). Fertilizers provide
the soil with nitrogen, which helps it maintain agricultural productivity. However, though beneficial for the crops, the nitrates washed by rainfall into the water supply around this land are harmful. Carolyn Sachs states that, “high levels of nitrates in groundwater occur in intensive agricultural regions” and that, “Several states promote strategies for decreasing groundwater contamination, but few major changes in agricultural production practices have been legislated” (National Research Council 1989 in Sachs 1996; 59). Furthermore, “High levels of nitrates in water harm lactating women and infants particularly” (Sachs 1996; 59). As agricultural enterprises have grown in size and technological dependency, spurred on by the availability of government payments to do so, the local environmental health diminishes, as does the health of the local people.

Economic development is another concern in the Delta. Labor is one facet of the plantation agricultural structure that continues to be an issue. As farm sizes have increased, the number of farms has decreased and operators have also mechanized which reduces the need for labor (Aiken 1998; 100). Although farmers provide compensation for the few remaining positions, salaries are still just barely over minimum wage.

Farmers have shifted their sole focus from cotton to include “chicken, catfish, and chips” (Salter 1996; Opinions Online). The chicken processing industry has positively impacted economic development in the state, but it is not concentrated in the Delta as are the “catfish and chips.” Within Mississippi, catfish farming and processing, along with the establishment of casinos, provide job opportunities outside of traditional agriculture. John Robinson, an agricultural economist, claims, “For all the uncertainty about farming, economists agree the Delta will remain rooted in a row-crop economy for the foreseeable
future. There's nothing on the horizon that could supplant traditional row crops” (Reid 1999; 1). So, although changes in economic activities have occurred, they are not enough to overshadow the dominant and long-standing practice of large cotton farming operations. The LeFlore County Tax Office (2003) claims that “Agriculture as a whole still is Mississippi's biggest industry. Including timber production, its annual value to the state is about $5 billion. And the Delta is the mother ship of the state's row-crop agriculture. Almost all the state's rice, 91 percent of its catfish, 80 percent of its soybeans and 81 percent of its cotton is produced in the Delta” (Reid 1999; 1).

In addition to attempts to shift agricultural land use, in some cases landowners are developing tourist destinations that tout a blues heritage and cotton plantation ambiance. Although, “there's not much adventure to be found in sharecropping: low pay, dangerous conditions and someone else's land, living in someone else's substandard shack… developers in the Mississippi Delta are now betting that tourists may have some fascination for sharecropping” (Simon 2001). For between $70 and $100 a night, in most places, tourists from Memphis, Jackson, and other surrounding cities come to experience a cotton plantation either in one of these shacks, or for more money, they can stay in a plantation house turned “bed and breakfast.” However, as popular as these destinations have become for a weekend get-a-way, the income and jobs provided to the population displaced by agriculture is minimal to say the least.

For the vast majority of the land that stays in agriculture of some sort, its future is influenced by the market, costs and profits, and agricultural policies (Muzzi 2002). Generally, in the U.S., farmers are facing increasing expenditures while the prices they receive for their crops continue to decline, or at least to fall short of meeting expenditures. The Delta is no exception.
Row-crop agriculture still is the dominant economic force in the Delta. But like their counterparts across the country, Delta farmers remain dependent on government subsidies to boost sliding commodity prices, help pay for crop insurance and pay for costly projects to lessen flooding. Individual Delta cotton farms, for example, are expected to receive more than $100,000 from federal taxpayers under a farm-assistance bill passed by Congress in October. (Reid and John 1999)

In essence, although farmers have tried to diversify, agriculture, specifically cotton farming, is the main economic activity of the Delta. However, it is not because it employs the most people, but because these operations cover a majority of the land area and are tied to millions of dollars in federal programs. Furthermore, it seems to make sense that when an activity dominates the land area and is a recipient of substantial federal support, that if many of the inhabitants of the area are not involved with the activity, then they will not be included in the prosperity. Therefore the alternative employment options in the Delta are mainly catfish production and casinos, not stellar choices for generating income that will be cycled through the depressed local economies of such towns as Greenville, Greenwood, and Cleveland.

History of Subsidies and How They Interact With This Place

Government influence largely drove the transformation of the cotton culture from what it was before the 1930s to the mechanized, chemically dependent enterprise that it is today. Before the 1930s the federal government most notably impacted agriculture through policies that determined the shape and size of the land area alienated to the farmer (Platt 1996). As far as supporting agricultural expansion by promoting particular crops and regulating the market, federal policy remained invisible, quite contrary to today. Flood, drought, declining commodity prices, and overall agricultural depression during the late 1920s, however, led to calls for aid and the New Deal provided the political push (Daniel 1985: 65). The Agricultural Adjustment Acts (AAA) were the first
major federal policy intervention followed by other programs of note such as the Soil Bank and CRP.

The Agricultural Adjustment Administration …was established in the Department of Agriculture by authority of the Agricultural Adjustment Act of May 12, 1933. After the act was declared unconstitutional by the Supreme Court, the Agricultural Adjustment Administration was reorganized in accordance with the provisions of the Soil Conservation and Domestic Allotment Act of February 29, 1936. Its later programs were conducted under authority of the Agricultural Adjustment Act of 1938 and related legislation. By an executive order of March 26, 1943, the Agricultural Adjustment Administration became part of the War Food Administration. (NARA 1966)

The AAA allowed farmers to remove land from agricultural uses while receiving payments based on the land’s prior productivity. “This payment varied from $7 for an acre that produced from 100 to 124 pounds to $20 for land that produced 275 pounds or more,” or alternately farmers could “purchase surplus cotton equal to the amount taken out of production and resell it at the market price” (Daniel 1985: 92). The program succeeded by enrolling 70 percent of cropland in the producing states. Therefore, it addressed and stabilized commodity prices. Another part of the AAA focused on creating wage parity between the farm workers and urban factory workers, which it accomplished. However, out-migration of agricultural laborers from the rural south was already underway. The region, especially the Delta, remained tied to the wealthy landowners and their discretion in distributing these parity payments.

When it began, federal intrusion challenged landlords by undermining the furnish system, but they quickly learned to manipulate programs. Combined with payments for cooperating with acreage reduction programs, the work and relief programs stabilized landlords with higher commodity prices and payments and allowed them to dump onto the government the paternalistic remnants of the tenure system. (Daniel 1985; 72)
The AAA, along with mechanization, teamed up to displace tenants throughout the southern United States, accounting for much of the out-migration. It also contributed to farm consolidation and thereby strengthened the capitalist farm structure (Daniel 1985: 104). Concurrent with the program to limit crop acreage, Congress established the Commodity Credit Corporation (CCC), which subsidized continued production of particular crops.

The CCC was organized on October 17, 1933, pursuant to Executive Order 6340 of October 16, 1933… and was established as an independent agency of the U.S. Government. The major function of the Corporation has been to make loans to producers in order to stabilize farm prices at a profitable level and to assure adequate supplies of farm products. (NARA 1965)

After the AAA and CCC, the next government-initiated farm policy of note was the Soil Bank in 1956. This program sought to remove environmentally sensitive land, especially in areas prone to erosion. In an effort to save this land, the government provided a payment per acre for its removal from cultivation. Removing land from production helped raise commodity prices by reducing supply. In addition, farmers replanted many of the Soil Bank acres in the South to pine trees, which gave the landowners additional income once the stands matured. Though these programs encouraged the removal of land from production, farmers did not retire all of their acres. In fact, on the remaining acres farmers tried to increase productivity in order to boost their income. Mechanization, chemical fertilizers, pesticides, and herbicides were applied toward this goal. The Soil Bank was not an influential force on land use in Delta counties in the Mississippi River bottom, but certainly affected those in the peripheral areas of the region.

Overall, programs focused on subsidization have the primary purpose of sustaining farmer income regardless of crop prices. Surrounding the practice of
providing subsidies are two main arguments. One view is that farm support programs are necessary and good; they provide a much needed system of support for U.S. farmers to compete in the global market. However, a contradictory argument against subsidies is that they inhibit developing countries from entering this market due to the artificially low prices the subsidies create for U.S. cotton. This argument claims the payments mostly go to corporate agriculture anyway, which defeats the purpose of upholding America’s family farmer tradition.

According to cotton farmer Chuck Coley, “In 2002, the United States enacted a new farm bill, which has come under constant criticism and has even been portrayed as a lavish handout to corporate farms. Nothing could be further from the truth. This law provides an important safety net for production agriculture and does so in a fiscally responsible manner” (Coley 2004; A11). He continues, “An effective farm program is essential for providing stability in production, financing and marketing, and in a broader sense, underpins the overall rural economy” (Coley 2004; A11). Also supporting the current farm programs are the National Cotton Council and legislators in cotton producing areas.

Representing an opposing argument to that of Mr. Coley, and unsigned article in the June 16, 2004 Editorial Page of the Atlanta Journal Constitution states that “subsidies directly contradict the premise underlying free trade and globalization, which calls for industries to compete on their own merits, without financial help from government.” This argument is supported by many of the cotton-producing developing countries. Their United Nations representative, Undersecretary General Anwarul Chowdhury, addressed the problem.
Cotton is among the main exports of at least 20 of the LDCs [Lesser Developed Countries], most of which are in Africa. As a result of the subsidies the United States grants its cotton growers, international prices for this commodity stand at 25 percent below what experts estimate they should be. A consequence of this imbalance is that Africa lost an estimated 300 million dollars in revenues. (Osava 2004)

The most prominent objection of American cotton subsidies comes from Brazil, though it represents the argument of many LDCs, to the World Trade Organization (WTO). The Economist reports the following situation:

In September 2002, Brazil complained formally to the WTO about America's cotton subsidies… The Brazilians claimed that America's cotton subsidies were higher than the agreement allowed and that they harmed Brazilian producers by lowering prices in world markets. Without subsidies, they argued, American exports would have been lower and world cotton prices higher. (Economist 2004; 77)

In June 2004 Brazil won its argument. This victory for Brazil and the other LDCs that joined in the fight against U.S. cotton subsidies represents the power of the emerging “global south.” Abraham McLaughlin, a writer for the Christian Science Monitor, muses that, “‘The South shall rise again,’ the old saying goes. But these days it may apply less to America's faded confederacy than to the up-and-coming trading power of the global South” (McLaughlin 2004; 7).

In 2003 the New York Times summarized the situation from a domestic perspective. “Right now, some of the nation's wealthiest welfare recipients are farmers ‘earning’ taxpayer subsidies in the high six figures, or more” (New York Times 2003; A 20). Professor Jeffrey Sachs, director of the Earth Institute at Columbia University also weighed in on the situation. In his New Republic article of September 29, 2003, Dr. Sachs provides a summary of both the global implications of cotton subsidies and their more local political roots.

For years, the United States has told West African nations--struggling
to survive against disease, famine, desertification, and debt crises—that their pleas for foreign assistance are misplaced. All they really need is “trade, not aid.” The International Monetary Fund and the World Bank, at the behest of American policymakers, have in effect advised Burkina Faso not to worry so much that two of every ten children there die before the age of five. After all, policymakers said, if Burkina Faso just followed the hallowed free-market path, it would find prosperity. On its face, the advice was cruel and misplaced, as it left millions of Africans to die needlessly in recent years. But the cruelty is even worse than that. Farmers in West Africa who literally staked their lives on trade—buying fertilizers and farm implements to compete on world markets—now find that they actually have neither trade nor aid. (Sachs 2003; 12)

Dr. Sachs provides the political stimulus to what appears to be an unfair trade practice. “The reason: The Bush administration wanted to protect roughly 25,000 cotton growers in the South, whose main harvest is billions of dollars in government subsidies” (Sachs 2003; 12). In addition to these critical viewpoints, within the U.S. a conflict exists between various interests represented in the Farm Bill. This struggle brings forth the previously mentioned fact that this legislation covers both agriculture and rural development objectives, which are not the same and are unequally funded and supported.

In 1989 Congress established the Lower Mississippi Delta Development Commission to address the very problems discussed here. Former President William J. Clinton and the governors of each Delta state oversaw economic and social development projects to raise the region’s quality of life. Having spent millions of tax dollars on this endeavor, the Delta has yet to rise from its persistent poverty. With so much media attention and money focused on these issues, the question rises why the region did not experience a turn-around? Also, considering the financial resources sent into the region in the form of agricultural subsidies and economic development funds, why has this money not visibly found its way into the rural communities where it is supposedly spent?
Conservative theory of poverty claims that problems faced by people in the Delta are the fault of each individual experiencing degraded quality of life, that they brought this situation upon themselves. It is hard to believe that such a group of individuals exists and that they exist in such a localized fashion as in the Delta. Disbelief in this thesis leads to the current paradigm in poverty studies which states that systems and processes beyond the individual are responsible for an inadequate standard of living. Ascribing to this theory, another question arises of what system(s) or process(es) are at work in the Delta that could be influencing the prevalence of negative social, economic, and environmental characteristics?

Farm structure, or agristructure, is at the heart of the situation and has been a topic of repetitive study by scholars who time and time again show a relationship between corporate or large-scale farm organization and negative societal consequences in rural communities. Granted, the findings have supported a range of positive relationships from mildly to strongly positive and have neglected the role of subsidies in this relationship. Historically, agricultural subsidies have been implemented during times of need for farmers, but they have carried over into time of plenty. In fact, we are in times of too much as these subsidies promote overproduction of the crops they support.

However, overproduction is only one outcome. In the Delta, subsidies are believed to encourage the status quo by promoting large-scale corporate farming. Since mechanization and the advent of pesticides and herbicides, this in an enterprise that does not have a need for much labor and the labor that is hired has historically been low-wage. If viewed as the business that it is, this type of agristructure has a monopoly on the land in these Delta counties, therefore limiting the acres of any other type of economic enterprise to the area. Any time an industry or company has a dominant role in
employment, as farming does in the region, and it changes or leaves, the local population may be harmed. Such is the case for areas dependent on military bases or large manufacturing plants. The same is true in the Delta with cotton farming as the industry.

The media has exposed the voice of the developing world in its opposition to U.S. agricultural subsidies, but it has failed to make a similar case for the Delta. In fact, even research on the problems of the Delta has neglected to identify farm structure and subsidies as formative issues in its social and economic deprivation. These elements are treated as if they are disparate. However, this research will show that large scale agriculture, negative socio-economic characteristics, and farm subsidy payments are not disparate variables, but are in fact highly correlated in the Delta. This set of relationships is disadvantageous to the majority of Delta residents and counteractive to federal development initiatives. The hypothesis will be tested through quantitative analysis, which will be supported by interviews. These methods will show that areas with a corporate/large-scale agristructure are the same areas that receive high rates of agricultural subsidies and furthermore produce negative quality of life influences for rural society.

The results of this study will show a landscape of interrelated agricultural and social subsidization along with the true variation that exists in the region. With this knowledge policy makers and academics will hopefully look at the Delta as a place of diversity and treat it as such in future policy creation and research. Furthermore, highlighting the role of agriculture in creating this pattern of social and economic variance will provide an impetus for additional studies into ways quality of life can be improved for the people residing in the Mississippi Delta.
CHAPTER 2 - LITERATURE REVIEW

Introduction

In the past forty years, as agriculture has become highly vested in government capital and necessarily dependent on technological progress, several academic specialties have become conscientious observers of this process and its social impacts. A review of their literature provides several conceptual approaches to this topic. The first is land tenure. It encompasses the history of the Delta, plantation agriculture, land tenure theory, and the Goldschmidt Hypothesis on agricultural structure and its societal impacts in rural communities. The second line of thought follows the role of government involvement in U.S. agriculture and contains work on policy, crop subsidies, technological contributions to farming. Finally, a review of research on geography’s relationship with public policy situates this work in the literature of the discipline.

Land Tenure

History of the Delta. The history of the Delta, formative to the human conditions that exist today, begins with physiography, Native Americans, and initial European settlement. The Mississippi River is the dominating physical force of the region. Beginning its southward movement as a stream in Minnesota, it carries sediment picked up along the way to the Gulf of Mexico and begins depositing it as it slows nearing the ocean. Though the geologic river delta is a triangular formation extending inland from the mouth of the Mississippi and Atchafalaya rivers, deposition also occurs along its banks further to the north. The combination of the Mississippi River and the rivers that flow into it, such as the Yazoo, provide an environment of fluvial deposition from several sources forming what is known as the Mississippi Delta. The soil in this floodplain is dark and nutrient rich, amenable to agricultural production.
Before European settlement, Native American tribes such as the Choctaw and Chickasaw occupied the land. Their presence influenced the relatively late European settlement in the area and their legacy is evident today in the place names of the region. However, when the British needed more land for cotton production to feed their textile mills, they removed the Native Americans and began reclaiming the land from the river. “The earliest European colonization in North America was commercial and exploitive” (Birdsall and Florin 1992; 226). Therefore, establishment of large-scale farming operations, plantations, was in concert with the earlier practice of resource extraction to profit the colonial power. Sachs (1996) states that the U.S. approach to land alienation and economy has provided an environment of disparity for people outside the circle of owners. “In Europe and North America state policies and capitalist agriculture set the stage for concentration and land ownership and the progressive displacement of people from the land” (Sachs 1996; 46). Though the Native Americans were the first residents of the Delta to be displaced from land they occupied, the African Americans who served as labor for the plantations have also been displaced through a change in agristucture. Birdsall and Florin (1992) describe the Delta’s “exclusively plantation country” wherein the population since 1860 was predominantly African American and still is to this day (Birdsall and Florin 1992; 254).

Plantation Agriculture. A central component of the Delta’s history is its occupance by cotton plantations (Cohn 1948; Cobb 1992; Woods 1998). Often, it is this type of land tenure that is blamed for the social, economic, and environmental problems of the region’s past, present, and future. “From New Orleans to Memphis ideal conditions existed for plantations – fertile land available in large tracts, convenient transportation,
and labor in the form of slaves. It was here that the plantation would reach its greatest
density and importance” (Hilliard 1990; 118).

The 1910 Census of Agriculture concluded that the plantation system is
probably more firmly fixed in the Yazoo-Mississippi Delta than in any
other area of the South. The fertile soil and climatic conditions favorable
for cotton raising, together with the large Negro population, make the
plantation the dominant form of agricultural organization in the Delta.
(Cobb 1992; 98)

The presence of the plantation is still visible on the landscape and still felt in the
continuing deprivation by many, while a few reap wealth from the alluvial soil, not from
cotton, but from the federal government.

One of the foremost authorities on plantations is the historian U.B. Phillips. His
work has documented the existence, spread, and historical factors related to plantation
agriculture around the world (Phillips 1903; 1904; 1910; 1918; 1925; 1929). Though the
topic of plantations is broad, geographers commonly cite Phillips due to his geographic
perspective. Furthermore, Phillips’s proclamation that the southern cotton plantation had
died was the impetus for Merle Prunty to follow the research agenda of documentating the
existence of these agricultural operations and thus to a specialized literature pursued by
his colleagues and students alike.

Within geography, several scholars have turned their focus to Southern land use
Hart 1968; Hart 1975; Hilliard 1980; Hilliard 1982; Lord 1996; Prunty 1955; Prunty
1970; Prunty 1977; Wheeler 1998; Winsberg 1981). Within this literature, a more
narrow research topic arises on cotton plantations in this region. The present research
draws from these works due to their establishment of the location of plantations and the
morphological changes that have shaped what exists today in the Mississippi Delta. The
plantation has a unique regional relationship with the agriculture of today as well as the 
socioeconomic conditions in the area.

Though not the first or only geographer to research plantations (Chardon 1984; 
Foscue 1936; Thompson 1941), Prunty produced seminal work that identifies their post-
bellum existence in the South (Prunty 1955). His work from 1955 onward creates a 
typology based on morphological factors and further observation of the changes that 
occurred in these places (Prunty 1956; Prunty 1962; Prunty 1963). Colleagues and 
students of his work further contributed to this specialty within geography (Aiken 1971; 
Aiken 1978; Aiken 1985; Aiken 1987; Aiken 1990; Aiken 1998; Gregor 1962 Gregor 

Tangential to the geography of southern cotton plantation arose literature on the 
Following the precedent set by Prunty, that of observing morphology and change, these 
works provide geographic insight to land use in areas of the South where the cotton 
plantations were not so prevalent. Tobacco and rice plantations were another landscape 
that attracted the attention of geographers (Hilliard 1978, Hilliard 1990), but of these, the 
cotton plantation received the most interest. However, a change has occurred in the 
framework from which these places are studied, a change that is reflective of a shifting 
perspective of geographic research, from solely detailed observation and description to 
expansion of ecological relationships, or more simply phrased, from morphology to 
ecology. Scholarly work produced on this topic was, until the late 1970s and most 
notably the 1980s, predominantly descriptive with roots in the concept of sequent 
occupance (Dodge 1938; Fisher 197; Gruys 1958; Whittlesey 1929; Mikesell 1973; Platt 
1928). In 1929 Derwent Whittlesey developed the concept “sequent occupance” as a way
to study human occupance chorologically and as “a succession of stages of human occupance [that] establishes the genetics of each stage in terms of its predecessor” (Whittlesey 1929; 162). However, since that time the few geographers who have published on the subject have taken a more ecological approach, looking at relationships between these plantations, the outside world, and the processes that shape them and that they shape in turn (Aiken 1978; Aiken 1985; Aiken 1990; Aiken 1998, Mills and Mealor 2003; Winsberg 1997).

In the literature on southern cotton plantations, several themes emerge; morphology, labor force, and cotton culture. Morphology is concerned with the structure of the plantation, encompassing such characteristics as size, contiguity, road networks, housing, machinery, and non-residential buildings. Labor force focuses on the ratio of workers to farmland and the nature of the relationship between labor and management. The existence of crop cultures has been noted by several historians (F.S. Earle 1928, Berlin and Morgan 1993); but the cotton culture and other crop cultures in the southern U.S. are concepts to which historian Pete Daniel has contributed considerable knowledge (Daniel 1985). Carville Earle (1992) has lent a geographic perspective to crop cultures as they relate to economy. In particular, the topic of cotton cultures is concerned with the social aspects of cotton plantation agriculture and how the culture changes as the plantation morphology and labor change; the idea that land use structure shapes social structure.

Much of the work in geography on plantations has been criticized for its lack of theoretical perspective. However, even though it was not acknowledged in this literature, these works have a strong theoretical link to land tenure theory. Furthermore, with the
current research focus on the role of government in agricultural land use, the land tenure
type literature certainly informs its perspective.

Land Tenure Theory. The conceptual and theoretical framework for most geographic
research on plantations is rooted in work on land tenure, though it is also more meagerly
informed from the perspectives of uneven development, and staple theory. Forty years
ago, Bertrand and Corty (1962) asserted “there has been a growing concern over land
tenure problems in national and world agriculture in recent years. This concern stems
from the realization that social and economic development everywhere is dependent on
wise and equitable practices and policies regarding the use of the land” (Bertrand and
Corty 1962; 5). Land tenure theory is composed of three components: property, division
of labor, and distribution. (Bertrand and Corty 1962; 6-7). Though property and division
of labor have been studied geographically, it is the third aspect of land tenure theory that
applies specifically to this research.

According to economic theory…the impersonal market distributes economic
awards according to merit. Merit (or economic contribution), however, is too
narrow a concept to explain fully the distribution principle even in “free” market.
The sociological concept of “values” (ideas as to whether objects or behavior are
good, bad, desirable, etc.) is one of use here. It helps explain such things as
government intervention (in the form of subsidy measures, for example),
preferences of tenants, motivational factors, etc. All of these factors enter into the
broad concept of tenure. (Bertrand and Corty 1962; 7)

A variety of land tenure systems exist and each has social, economic, and
environmental characteristics that are spatially associated with it. Types of tenure are
defined primarily by who owns the land, and the government often plays a role in that
ownership. Bertrand and Corty (1962) state, “The particular forms to be found in any
country appear to be a function of government. They are closely related to the social and
economic well-being of the people” (28). Their work is concerned with the “major forms
or systems of land tenure and the distinct patterns of social and economic relationships characteristic of each” (Bertrand and Corty 1962; 28). Types of tenure are defined as follows:

1) restriction of rights to the use of “free” land, 2) communal arrangements for use and control of land, 3) control of land by independent classes of small owners or tenants, 4) control of land by owners of large private estates, and 5) large estates owned or controlled by church, state, or other public body. (Bertrand and Corty 1962; 30-43)

People who are a part of these types of tenure are said to be part of tenure groups, which are viewed as social systems within themselves (Bertrand and Corty 1962; 10). “In all agricultural societies there are designations for roles; the chief differences among which are tenure variations of the respective rights to the use of and the control over land” (Loomis and Beegle 1957; 309). Of these five categories, the fourth provides a framework for understanding the tenure situation in the Delta and insight into the social and economic characteristics that are incumbent with this type of tenure.

The Delta falls in the classification of *latifundia* where large landholdings are held by a powerful few (Bertrand and Corty; 36). “Latifundia have originated in widely separated times and places, but certain circumstances have constantly surrounded their birth” (Bertrand and Corty 1962; 36-37). These characteristics are: “the principal interest of the landlord is not the land he controls nor the welfare of its cultivators, but rather an income which is as large as possible, easily collected, and portable”; located where “an unusual demand for agricultural products – wool, meat, etc. – is found”; “have frequently followed some event in history which has decimated the population and made it easy to acquire large acreages without the eviction of a large number of tenants”; they “come into being and persist amid popular discontent” (Bertrand and Corty 1962; 37).
In a related work, T. Lynn Smith (1953) deals with the influence of size of landholdings and the number of owners (i.e. a few large landholdings with a few owners) on the social and economic characteristics of an area. “The extent to which the ownership and control of the land is concentrated in a few hands or widely distributed among those who live from farming is probably the most important single determinant of the welfare of the people on the land” (Smith 1953; 297). Bertrand and Corty (1962) observe,

The pattern of large private holdings, even at its best, does not encourage strong vigorous institutions and communities. Many of the usual functions of the worker families, such as education, social control, recreation, etc., are performed inadequately by comparison with families living on owner-operated family farms. (Bertrand and Corty 1962; 38)


Land use in the Delta is dedicated to resource extractive activities and is dominated by large landholdings owned mostly by wealthy farmers, consequently understanding the impacts of the land tenure system and activities on the land may be informed by works dealing with uneven development. Roberts and Emel (1992) describe uneven development as being “rooted in central processes of capitalist development” (249). They note that, “Resources expand and contract, and the people who depend on them become subject to the changes and instabilities that accompany dynamic change” (Roberts and Emel 1992; 267-268). Areas that fall in the under-developing side of
uneven development often face a change in capital flows such that a place once on the receiving end may find itself receiving less or none at all. Though the physical resource base is in the same location, the financing is not. Neil Smith (1984) claims that this situation has a spatial expression. He asserts that, “The tension between the mobility of capital and the immobilization insured by biophysical characteristics and fixed capital throws up a patterned rather than a random differentiation of space” (Smith 1984; 88-89). Capital flows into the Delta have been growing since the establishment of large-scale cotton farming, with additional flows coming from Washington in the form of commodity subsidies. The destination of these flows, however, is spatially segregated from the actual locations of cotton production. If the recipient lives in the Delta, it is usually in an affluent area. Many live outside of the region altogether. Separation of owner from land is the reason for segregation of monetary flow. Aiken (1998) clearly describes this ownership situation in the region and terms it “absentee ownership.” This pattern of flows is not one of complete relegation to places outside the Delta for certainly much of the money is put toward the agricultural enterprise. However, the expendable income from the generous subsidies is spent where the owner lives. Where this extra income is spent has an effect on the social, economic, and environmental characteristics of the region. Therefore, uneven development’s focus on capital flows is useful to understanding the flow of subsidies, how they are applied, and the repercussions of these inputs. Furthermore, uneven development helps explain the existence of the spatial division of labor within the region and between the region and the rest of the country. The Delta is an area of production with the larger country and the world as its correspondent area of consumption. “In relation to the substantive social sciences the argument is that the social structure of the economy, the social relations of production
necessarily develop spatially and in a variety of forms” (Hudson 1988; 485). The production activities impact the economy and labor, all of which influence social structure. Uneven development provides insight into these processes and informs the predominate framework of land tenure systems.

The geographer Carville Earle also provides salient perspectives through which to approach the roles of land tenure in the Delta. In the context of understanding the agricultural development of the area, Earle provides the idea of staple theory. “Staple theory is characterized methodologically by its attention to the ecological details of primary production and their societal ramifications…The method’s hallmark is in connecting these details of everyday agrarian life with larger structures of regional economy, society, and politics” (Earle 1992; 8). “In an important sense, staple theory is little more than a method for unraveling or unpacking the effects of a particular crop produced by a fixed level of technology in a particular region” (Earle 1992; 9).

Goldschmidt Hypothesis. Perhaps the most well known formalization of the ideas produced by Bertrand and Corty and T. Lynne Smith, is in the agristructure literature associated with rural sociology. The seminal work that is the genesis of a formalized theory of agristructure is the anthropologist, Walter Goldschmidt’s, 1947 study entitled, “As you sow: three studies in the consequences of agribusiness.” As Pete Daniel, Charles Aiken, Merle Prunty, and others who have studied southern agriculture have noted, mechanization reduced agricultural employment opportunities for local populations that historically relied on farm jobs. Goldschmidt also comments on this primary factor of why large-scale agriculture is detrimental to rural communities. He believes “the true irony of our agricultural economy is that we promulgate labor saving devices through capital-intensive land-extensive production and create thereby an army of low paid farm
workers and a large pool of unemployed” (Goldschmidt 1978; xxxii). Of course, Daniel would add to this observation the introduction of chemicals, which further reduced labor needs on farms. Goldschmidt also argues that social Darwinism is not at work in agriculture; the idea of survival of the fittest is not in play as it is according to a market economy – it is the farmers with the most assistance who survive and profit because the larger growers are given more governmental attention. “Governmental and other institutional policies have favored the large grower and given impetus to the constant process of industrialization and corporate control” (Goldschmidt 1978; xxxii). He demonstrated his arguments through the case studies of the towns of Arvin and Dinuba in California. Dinuba was a town surrounded by small-scale agricultural operations, while Arvin was surrounded by corporate agricultural activities. Over the course of his research he found that the quality of life of the populations, measured by a number of variables such as number of community services, employment, health, and education, remained notably higher in Dinuba than in Arvin. This seminal work was presented to Congress with much scrutiny from agribusinesses. Though his work has been critiqued and replicated, his methods and variables copied and then improved upon, his main hypothesis has not been disproved; large-scale agriculture has negative impacts on the well-being of its surrounding community that do not accompany small-scale agriculture (Albrecht and Murdock 1990; Barnes and Blevins 1993; Goss and Rodefield 1979; Harris and Gilbert 1982; Hayes and Olmstead 1984; Knutson et al. 1986; Lobao 1990; Lobao and Schulman 1991; Lobao et al. 1993; Reif 1986; Reif 1987; Wimberley 1987). In fact, Goldschmidt uses the Chi Squared test to define Arvin and Dinuba as significantly different on relevant social variables; the test showed a significant difference.
He revisits the earlier work of Isao Fujimoto in the San Joaquin Valley where average farm size and number of community facilities had a negative correlation. Goldschmidt replicated this study in 1977, thirty years after Fujimoto’s original work, with the same result (Goldschmidt 1977). Additionally, the comparative analysis between farm scales and poverty conducted by Phillip LeVeen (1970) points to negative impact by large-scale agriculture on the rural communities of which they are a part. However, to lend credence that this relationship is not one unique to California, T. Lynne Smith’s (1953) work in identifying areas with notable class distinction between upper and lower with minimal middle class is calculated in a Pearson’s correlation equation with a study on large scale agriculture provided by Nikolitch (1970) with the resulting correlation coefficient as $r = 0.76$. Goldschmidt (1978) concludes that “such a close relationship demonstrates that the formation of a class-oriented society of the kind I have described for California is a direct consequence of the incidence of large-scale agriculture; that is, it will appear wherever such organization prevails” (Goldschmidt 1978; xlvi).

In addition, he acknowledges the absentee ownership style of operation as a characteristic of large-scale agriculture, one that Aiken has identified as being a part of cotton operations in the Delta. Commenting on the corporate investment style agriculture invading the Midwest, Goldschmidt cites a local minister as saying, “educational facilities may deteriorate, religious institutions may disintegrate, and social organizations may evaporate, but it will not affect the investor or his investment” (Goldschmidt 1978; xlviii). This situation exists when the investor is not socially a part of the place where the investment is located; what matters is the profitability of the investment, not the profitability of the place or the people who inhabit it.
Goldschmidt’s seminal work is the bedrock for the body of work concerned with agristructure and socioeconomic well-being of the rural United States. As he acknowledges (1978), his study drew intense criticism from agribusiness and its political associates, yet it still stands as the irrefutable aegis of understanding farm structure and rural vitality.

More recent commentary on his work and this subject has been abundant within rural sociology (Albrecht and Murdock 1990; Barnes and Blevins 1992; Heffernan 1972; LeVeen 1970; Reif 1987; Reif 1990). Linda Labao et al. (1993) observe that since the Goldschmidt hypothesis, researchers focused first on replication, and then on critique specifically in three areas: nonfarm structural indicators, geography, and conceptualization of farm structure (Labao et al. 1993; 277). They criticize Barnes and Blevins (1992) for reverting to replication while also offering old ideas of how to progress in research on agristructure and rural socioeconomic well-being. Common critiques of Goldschmidt’s Arvin and Dinuba study are: it is not clear on the relationships between the agricultural and socioeconomic variables, thus the mechanisms of change are unclear, it does not explain why scale has a negative impact on well-being, the indicators are questionable over space and time (what is relevant in one area at one time may not be so at others), what defines community well-being, regional and temporal context impact findings (though Barnes and Blevins 1993 claim that generalization is important in describing the relationship, i.e. is large scale farming generally bad for the associated community); impact of nonfarm factors in changing agristructure (relationship is not necessarily linear) and what are the salient nonfarm factors that can be related to agristructure (Albrecht and Murdock 1990; Barnes and Blevins 1992; Heffernan 1972;
LeVeen1970; Reif 1987; Reif 1990; Wimberley 1987). In subsequent chapters this dissertation critiques the selection of variables and explanation of their analysis.

Several of the most prolific scholars on Goldschmidt are Ronald Wimberley, Linda Labao, and Max Pfeffer and Jess Gilbert, though other works of note are provided by Kevin Goss and Richard Rodefield (1979), Gary Green (1985), Craig Harris and Jess Gilbert (1982), and Michael Hayes and Alan Olmstead (1984). Their work contributes to the current research question and to the variables selected for analysis.

Wimberley (1987) addresses how to measure structure referring back to the work of Goldschmidt, he questions the longitudinal viability of the variables used as well the dimensions that are represented in his measurement. He claims that agriculture is not just large-scale or small-scale, but that it should be further differentiated into corporate-commercial, large-scale categories. He uses factor analysis to identify the groups of variables that are significant in identifying areas that fall into these categories. With this development Reif (1986, 1987) utilizes the indexes to conduct research on the relationship between agristructure and various social well-being indicators and claims them to be beneficial to understanding the analysis. In additional to his contribution to the study of the relationship between agristructure and rural society, he studies the types of policies that impact this relationship (Wimberley 1993). He identifies societal, agricultural, and rural policy types that are all combined under such overarching legislation as the Farm Bill that attempt to address the mostly disparate and only sometimes shared concerns of the populations and places represented by these policies. In essence, Wimberley (1993) establishes the need for policy analysis within this arena with an understanding of geographic principles in that place should matter to policy and
that inequalities in places are established and perpetuated by policy that is blind to this fact.

A student of Wimberley’s, Linda Lobao Reif, has been not only prolific in advancing studies on the relationship between agristructure and society, but has been at the forefront of proclaiming the importance of geography in this research and the usefulness of GIS to this end. Lobao (1990) likens agriculture to industry, therefore not accepting the proposal of agriculture’s exceptionalist nature. In her concern with inequality and uneven development, she draws from Massey (1998) on the spatial division of labor as she incorporates the spatial component of her concern. From a methodological perspective, her work is concerned with the scale of studies, such as Goldschmidt’s and those that follow in this tradition, the spatial and historical context in which these relationships occur, the mechanisms through which a causal force exists, and comparative relationships with the non-farm sector (Lobao et al. 1993). Though her work includes a geographic appreciation, unfortunately its regional approach seldom takes into account distinctive heterogeneities that exist at that scale (Reif 1987, Lobao and Schulman 1991). For example, she considers the South as an agristructural region, however a geographer would note that this categorization is inappropriate given the smaller family farm structure that exists in the Piedmont and foothills of the Appalachians and the larger structure in the coastal plain, and the anomaly of much larger farms and a more corporate-commercial structure in the Delta, in addition to the different crop patterns through the region as a whole. Given this shortcoming in spatial analysis, Lobao makes a substantial contribution to understanding the spatial variation of rural places in considering spatial inequality and refreshing cross-disciplinary appreciation and application of geographic concepts (Lobao and Saenz 2002; Lobao 1990).
In their case study of farm structure and agricultural subsidy receipt, Pfeiffer and Gilbert (1989) compared the situations of one Delta county and one Cornbelt county. In the Delta they report that “some informants maintained that large farmers have blocked attempts to bring in industry for fear of labor competition, while others argue that the county is doing all it can to attract new jobs” (Pfeiffer and Gilbert 1989; 556). However, they also note that “Delta farms are on average much larger, more highly capitalized, and more reliant on wage labor than their counterparts in the Cornbelt” and that as farm subsidy participation increases so does the need for labor. “But farm programs actually limit the expansion of employment, because farmers are able to enhance income with fewer inputs of labor than they would require to achieve the same increase in the absence of program benefits” (Pfeiffer and Gilbert 1989; 564-565). They conclude that agricultural subsidies have different effects in different social classes and that regional variation is important in understanding the impact of these farm programs.

Government Involvement in U.S. Agriculture

**History of Government Programs in U.S. Agriculture.** From the time of European colonization, government policies have guided the settlement of the United States. This point is no more visible than in the patterns of land division observable from an aerial perspective. Rutherford Platt (1996) claims that, “To many observers, the scene below is a pleasant, but seemingly random series of abstract images, like the geometric patterns produced by a kaleidoscope. To one with geographic training or interests, the variation in the landscape offers not only aesthetic, but intellectual stimulation”(xiii). These variations, though partly the result of physiography or inheritance, are originally shaped in some way by the policy of land alienation applicable to that place; either the American long lot where Americans settled land formerly in the hands of the French, metes and
bounds to the east of the Mississippi River, various state systems, or the grid-like U.S.
rectilinear system commonly found to the west of the Mississippi River and north of
Ohio. Not only has government policy guided the shape of landholdings, but also the
amount of land one could possess. During westward settlement, this type of policy was
evident in the Homestead Act. Since initial settlement, the government has been a part of
both urban and rural land uses from zoning ordinances to swampland drainage. It has
encouraged some activities and discouraged others; in the case of swampland drainage it
has encouraged it at one point and frowned upon it at another.

“Agrarian ideology in the United States, often traced to Thomas Jefferson,
promotes an agrarian democracy based on family farms. The superiority of farm life over
urban life, long a theme in Europe, influenced Jefferson” (Sachs 1996; 132). Deborah
Fink (1992) observes that agrarianism was “embedded in a political and economic
context purported to benefit family farmers” though it “disproportionately benefited
political and economic elites” (Sachs 1996; 132). During the Great Depression, the
agricultural sector of the economy was severely disrupted, as was the economy as a
whole. In order to rejuvenate America’s farm production and to provide income parity
between America’s family farmers and their urban counterparts, President Franklin
Roosevelt and Congress initiated the Agricultural Adjustment Acts in 1933. This
government assistance was intended to be a temporary catalyst for economic recovery
that would be removed once farmers were resuscitated. (U.S. Government Accounting

In the case of agricultural land use, one of the most broadly applied and still
visible acts of the government was the creation of the Agricultural Adjustment Acts
(AAA), especially in the Delta where the progeny of the program thrives in the form of
subsidies. The confluence of the Mississippi River flood of 1927, drought in the west during the 1930s, low commodity prices, and nationwide depression during the 1920s led to the need for aid (Daniel 1985; 65). As people were migrating from agricultural to industrial labor, they found higher wages in these urban jobs. The AAA were created in part to create wage parity between these two sectors, with the assumption being that by establishing a payment program from the government to the farmers that fills the gap between the commodity price and what the farmers needs to be profitable, that income parity would be achieved. Not only was this a successful income remedy, but it also included acreage reduction requirements to reduce the commodities available on the already-flooded market, an action that naturally drives up prices received by farmers. This policy action fixed wages as a stopgap, and addressed causes of the low prices as well. However, Daniel (1985) describes the ways the AAA changed not merely the economic situation of farmers, but the social intricacies that accompanied its inception. Especially in the South, where many former slaves now had property through which they were able to be share tenants, these farmers should have been receiving benefits of the AAA since they were working the land and selling their crops. However, landowners were known to take advantage of their tenants and reap the government payments for themselves. Also through the AAA, social support programs had been established in rural areas to help those suffering from the depression. In effect, for much of the rural South, the people participating in these programs were African American farmers and their families. Therefore, the AAA provided welfare to two groups, though supposedly unknowingly to the landowners instead of the black farmers. The AAA, along with mechanization, teamed up to displace tenants. It also contributed to farm consolidation and thereby strengthened the capitalist farm structure (Daniel 1985: 104).
Although the AAA is often cited as one of the most influential acts of government in agriculture, a couple of modern polices have also had transforming impacts of land use, rural economies, and the visible rural landscape. Congress created the Soil Bank in 1956 to take land out of agricultural production in order to reduce the commodity supply, therefore helping raise prices, but also to limit agriculture on lands that were deemed marginal or unsustainable. Not only did this program visibly change the rural landscape from crops to trees or idle land, but it also reduced the need for related agricultural enterprises servicing this activity, and in some places, people moved away from their farms thus further contributing to rural depopulation and the associated financial strain on the rural community (Fravega 1970; Hart 1968; Prunty 1970).

In 1985 the Farm Bill became legislation. Also known as the Food Security Act, this legislation is reminiscent of the AAA and Soils Bank programs. The Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP), initiated under this Farm Bill, essentially reinvigorated the previous policies of payments for acreage reduction; this time, though, the aim was marginal or environmentally sensitive land. The CRP/WRP monetarily encourages and rewards removal of farmland to more environmentally beneficial uses; regarding the WRP, farmland is eligible for retirement if it has wetland habitat within its boundaries. Although this program claims only to be directed toward the removal of “marginal” land, interviews with agricultural agents and land-owners have shown that this is not the case (Mills 2001). Viable farmland has also converted to non-farm uses, such as pine plantations, because this is a more financially stable and lucrative decision for farmers given the low prices on the world market.

Established through Title XII of the 1985 Food Security Act as a voluntary agreement entered into by the landowner, the Conservation Reserve Program (CRP)
provides financial compensation for enrollment in this land-retirement program. Through the Commodity Credit Corporation (CCC) the government provides an annual per acre payment as well as up to half the cost of establishing a specified permanent land cover. The Farm Service Agency (FSA), National Resource Conservation Service (NRCS), State Cooperative Extension Services, and related agencies at both the state and local levels provide support for this program.

The FSA is also the responsible governmental division for enrolling farmers in subsidy payment programs that are the focus of this research. In this case, a subsidy is simply a payment made by the U.S. government to a farmer for planting a specific crop, i.e. cotton. This practice of direct payment is rooted in the AAA of the 1930s, but has been a commonly used method of support through the Soil Bank and the Conservation Reserve Program / Wetlands Reserve Program (CRP/WRP) policies. Though this dissertation is examining all direct payments as a subsidy, many different types exist. For the purposes of this research, all farm support payments will be assessed, due to conversations with county agents and farmers who state that this income source is integral to their ability to remain in production. In actuality, though, there are several types of subsidies, all of which are facilitated through the FSA.

Deficiency payments exist to soften the blow of low market prices; a “target price” is set by legislation for the five years between farm bills and at the end of any year when the average price received for cotton falls below the set target price, farmers receive compensation for the difference by the government. Nonrecourse loans are government provided funds to underwrite production costs; loans are for ten months after which point the loan may be paid back, the crop may be used as exchange for the loan, or the crop can be held up to eight months while the farmer waits to see if market prices
improve at which point the crop is sold and the loan repaid. In 1985 an addition was made to this provision whereby if the farmer decided not to hold cotton off the market, while waiting on possible price increase, the government would provide a Marketing Loan. This option keeps a steady commodity supply on the market, therefore allowing U.S. cotton prices to be more in line with the world market. The loan rate of a marketing loan is lower than a norecourse loan, therefore making it more attractive. Furthermore, when the interest rate is higher than the world price for cotton and the farmers sell the crop, the United States Department of Agriculture (USDA) pays the difference between the world price and the interest rate and pays storage for the crop until prices are more favorable. According to the USGAO, cotton is the only crop where the USDA pays this cost (USGAO 1995; 15).

Use of the acreage reduction program depends on the amount of crop that is exported. To receive subsidies a farmer must idle a percentage of his crop, yielding the critique that this policy spurs more intense production on fewer acres through fertilizer use. Meanwhile, the Flexibility program encourages cotton farmers to use a percentage of their land to plant alternative crops to cotton based on market price indicators while still receiving their cotton subsidies. Another type of subsidy is the 50/92 (or more currently the 50/85) program wherein farmers plant 50 percent of their traditional cotton acres in cotton and the rest in either another crop or they may choose to devote it to specified conservation measures; though only planting 50 percent in cotton (which would normally reduce the payments they receive by half, they can retain 92 percent of a deficiency payment which effectively reduces the acres of cotton produced, provides incentive to diversify while still receiving income from alternative crops on half of the cotton acreage, and almost all the dollars that would be received for planting all land in

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Finally, a few other options exist within the subsidy programs such as Step 1, Step 2, and Step 3: these provisions assist with exporting cotton and originate in the 1990 Farm Bill. Step 1 gives the Secretary of Agriculture the power to lower the adjusted world price for cotton for U.S. producers and this effects payments based on the difference between world price (adjusted) and USDA loan rates. Step 2 operates when the U.S. cotton price exceeds the world price for cotton; cotton exporters and mills are paid the difference because of their increased costs in exporting or processing the more expensive crop. This program is controversial; critics claim it is unfair and a redundant use of money. Step 3 is an import quota, again implemented when U.S. prices exceed world prices for specified periods of time. Its purpose is to limit the amount of foreign cotton domestic manufacturers can purchase, thereby protecting U.S. cotton by not allowing the market to be flooded by less expensive foreign cotton. Most of the programs within the larger cotton program have come about from the 1985 Farm Bill and 1990 Farm Bill.

Given this overview of the relevant subsidies to farmers in the Delta, they may seem complex but helpful to the farmer and benign to society. When they or their predecessors were originally conceived, no doubt existed that their creation came about without malevolence and only with a mind toward helping the many farmers facing depressed prices and insufficient sales due to the market conditions of the time. However, policies are created within a temporal context. They aim to fix what is perceived to be wrong at that time. The problem with policies however, is that they persist even after the situation has been corrected. Over time, rather than being updated to maintain their objective, they remain in an original form, which may not be applicable to the present economic or agricultural environment. In addition, the United States is
known for a degree of protectionism in trade regardless of free trade rhetoric. One change may be made to open the market, while another is enacted to continue protection. For example, the North American Free Trade Agreement (NAFTA) and General Agreement on Tariffs and Trade (GATT) are moving the U.S. cotton program toward compliance with the free trade initiatives by removing import quotas. However, the market is not truly free yet. In order to soften the blow of possible increased imports, import tariffs increase the price of these incoming goods, which now do not have to stay within a quota (USGAO 1995; 15-19). The perception, then, that subsidies are unfair and even harmful to society is based in this context.

Complaints About Government Support. From a domestic perspective, the main complaint about government payments is that they are not helping the family farmer so idealistically portrayed as needy. The U.S. Government Accounting Office (USGAO) finds that

All of the 295 producers who received in excess of $250,000 were entities organized as joint ventures, partnerships, and corporations. For example, the operation that received the most in cotton program payments ($4.4 million) for 1993 was a general partnership with 39 members who formed 66 corporations, covering more than 20 farms that produced an estimated 16 million pounds of cotton in three counties within two states. (USGAO 1995; 29)

A concern also exists that the subsidy amounts are exorbitant, greatly exceeding farming costs and thereby provide a government guaranteed profit. The USGAO finds that “When government payments are added to producers' revenue, total revenues are well above all costs of production” (USGAO 1995; 30). This result was not the intention of the original AAA subsidy policy, which sought price parity between industry and agriculture. Congress did not intend farmers to become wealthy at the expense of the government, just to be able to make a living at their trade. However, given the current
structure, people involved in farming have found ways to circumvent the intention of the system as documented by the USGAO (1995).

In response to concerns about large payments to farm operations and the overall cost of federal farm programs, beginning with the 1971 crop, the Congress limited the annual amount of certain program payments a person could receive. Today, a "person" may receive up to $50,000 in deficiency payments and up to $75,000 in marketing loan gains and loan deficiency payments annually. Both of these limits are included within an overall limit of $250,000 that also includes disaster payments and other adjustments. "Persons" may be not only individuals--including those participating in general partnerships or joint ventures--but also entities such as corporations. Each individual or entity who qualifies as a separate "person" and meets additional "actively engaged in farming" requirements is eligible to receive payments up to the applicable limits. Some cotton farming operations are so organized as to have numerous "persons" associated with them. This effectively increases the amount of payments that the operation receives beyond the amount normally available to an individual. (USGAO 1995; 16)

In addition to the common complaints from home and abroad about adverse effects, this dissertation will examine an additional impact. As cotton subsidies rise with increasing production, they provide an incentive to expand farm acreage hence necessitating more chemical fertilizers, herbicides, pesticides, and more machinery while reducing labor. With an already existing absentee ownership situation, the subsidies only encourage a larger-scale agristructure, which has been associated with negative repercussions for the rural communities.

Participation in farm programs varies geographically, as does its impact on the associated areas. Pfeiffer and Gilbert (1989) note that different crops have different production structure needs. As Earle (1992) argues, broadcast crops, such as corn, need little annual supervision and labor beyond the season planting and harvest. However, a row crop like cotton needs more intensive care and attention. Earle supports the idea that historically the crop type determined labor needs, therefore a certain production structure. In the case of cotton, the antebellum structure was slavery. Pfeiffer and Gilbert surmise
that “given these differences, farm programs may have widely varying impacts on local farming communities, depending on the type of farm organization characteristic of the area” and that “given regional differences in farm structure, farm program participation might be expected to have differential impacts not only within geographic regions, but between them as well” (Pfeiffer and Gilbert 1989; 554). They argue, however, with the idea proposed by Earle, in that they believe local history rather than solely crop type influences farm structure. They state that “differences in farm organization are not an artifact of varying cropping patterns” and that “differences in farm organization are primarily attributable to the distinctive histories of socioeconomic development” (Gilbert and Pfeffer 1989; 556-557).

One aspect of the development of large-scale agristructure is the need for mechanization. In the past farm size increased and labor demands followed, then mechanical farm implements became a more attractive alternative. For instance, in the Delta, initially slaves worked on the plantations, then share-croppers, share-tenants, and finally hourly cash-wage hands provided labor. With the advent of the Civil Rights movement and minimum wage laws, laborers had greater demands than landowners were accustomed to granting. Many members of the African American farming workforce migrated to larger cities such as Chicago, St. Louis, and Memphis to find industrial jobs that paid at least the minimum wage. This situation is one that considers the “pull” factors that allowed mechanized agriculture to gain a strong hold on the Delta (Woods 1998; 91, 115. However, the idea that implements were a “push” factor for the labor to leave the area also exists (Aiken 1998; 100, Woods 1998; 130). Regardless of the historical context, presently the necessity for increasing acreage makes mechanization essential to farming cotton in the Delta (Mills and Mealer 2003). This situation is a
barrier to employment for the local population; the activity that once hired so many, now hires next to none. Even in the local cotton gins, the black population provides only some of the work. Competition from low cost Hispanic immigrants has begun to fill these seasonal positions.

Geographic Considerations

Application. A rich literature on rural land use and agricultural research topics, especially those focused on the southeastern United States, appeared during the 1950s-1970s. Merle Prunty and John Fraser Hart spearheaded this body of literature that has been enriched by the work of their students. However, often the sole interest of their work was land use; the local societal well-being was not questioned. Nonetheless, government influence was a curiosity for these scholars. Therefore, the current research attaches its geographic roots in these earlier works, though certainly more recent research into policy, poverty, and rural sociology are influential.

Rutherford Platt (1996) states that, “laws established to address one problem may compound others. And laws have a habit of remaining in effect long after changes in circumstances have rendered them moot or even pernicious” (xiv). Therefore, policy, like law, is a subject of academic interest that should be visited and revisited in order to contribute to relevant and useful programs that are beneficial to the people it serves. Furthermore, the federal government approves a multitude of policies that impact agriculture either directly or indirectly; while each is defined at a national level, the results of its implementation will vary at local levels due to dependence on the crop, acres of crop planted, number of farmers (local or otherwise) invested in that crop, and importance of associated industries to the impacted crop. It could then be said that a policy that is beneficial and useful for one area, group of people, or environmental
situation at one time, might not be so at another. As a case in point, the most current “top
ten” list of policies providing money to agricultural interests in the Delta contains
incentives to produce specific crops, but also encourages cropland removal. Both
approaches, removal and continuance, are between fifty and seventy years old. In
addition, “many policies do not account for local impacts” and policy often reflects the
desires of the powerful, therefore, “policy outcomes tend to favor those groups and areas”
(Martin 2001; 203). The case in the Delta supports Martin’s conclusion. The agricultural
land in this region is primarily owned by wealthy, educated, white men, or corporate
interests that typically do not reside in the area, but in nearby cities such as Memphis,
Jackson, and New Orleans. Also, many farmers do not live on their land, but in cities in
the Delta. The remaining rural Delta population is mostly impoverished African-
Americans who receive few benefits from these policies.

Additional studies of the geography of land use and government policy in the
United States are most often found in several areas of specialization, not mutually
exclusive, within the discipline: cadastral patterns and alienation; economic geography;
aricultural, rural, and historical geography; environmental and political; and in general
policy studies within the discipline.

The most basic geographic literature to this dissertation lies within studies of
cadastral patterns and alienation, which is commonly found in settlement and historical
geography, and in location rent theory from economic geography. This literature is
foundational in that it describes how the government divided and dispersed land parcels
to owners, and then how land uses developed based on location. Though basic to the
eventual development of the plantation, the cadastral pattern is by no means as salient a
force in present agristructure as suitable physical geographic features and economic
interests in the region. Though much of the fertile ground required draining, its location along the Mississippi River provided a main transportation line for trade from the Gulf of Mexico into the United States. The cadastral patterns that result from federal policies of survey and alienation have framed the large tracts of land often found in the Delta (Sinclair 1967; Wheeler 1998; Winsberg 1981; Chicoine 1981; Young 1962) and the cotton economy that resulted, though greatly influenced by physical geography, also has roots in economic geography (Clawson 1968; Conzen 1990; Hart 1975; Platt 1996).

Agricultural and rural geography in the southern United States have been strongly influenced by the works of John Fraser Hart, Merle Prunty, and a student of Merle Prunty, Charles Aiken. Their studies on land-use change and transitions in occupancy began in the 1960s and continue into recent works. Hart has dealt mostly with the changing agricultural landscape in the rural South; initially he considered the role of the government important. Currently his interest is in cultural and not political geography (Hart 1967; 1968; 1982; 2000). Prunty and Aiken are primarily known for their research in changing plantation land use, tenure, and the social repercussions (Prunty 1963; 1970; Aiken 1978; 1998) though several other academics wrote on this subject at its height in geography, the 1960s and 1970s (Anderson 1970; Bailey 1978), in addition to the students of both Hart and Prunty. Most recently, this traditional literature was updated by studying the transition of a Delta plantation, with respect to global forces (Mills and Mealor 2003).

Environmental geography also provides literature that informs the study of agricultural policy’s relationship with the human landscape. This is accomplished through both historical and current studies in agricultural degradation of the land and in examination of policies related to the agricultural landscape. As early as 1921, Hugh
Hammond Bennett, prominent government servant and geographer, vociferously proclaimed the error in exhausting cropland, the devastation it wrought, and what should be done about it (Bennett 1921; 1943). Lewis Cecil Gray, a USDA economist also studied the relationship of farm structure and tenancy on the environment (Gray 1932; 1976). In the 1980s and 1990s, however, a historical approach was directed to this relationship, one that was vigorously debated by Carville Earle (1986) and Stanley Trimble (1985). Specifically of interest was the role of policy and farmers in causing or exacerbating soil erosion. Though they consider the complex causes of erosion processes in the Cotton South, the federal government’s role in conservation is not a primary focus in either work. Earle, however, points to the need for further research into this neglected aspect. He states that, “during the long depression of the late nineteenth century, cotton planters abandoned the cotton-corn-cowpeas rotation in favor of higher profits from cotton specialization and intensive fertilizer application” (Earle 1992; 293). He argues that this action was detrimental to the environment because the full outcome of use was not known at the time of government implementation.

Furthermore, environmental geographers have shown interest in various policies, especially resource management and the role of government in this endeavor. Initiated by environmental history, the topic has since attracted geographers. For example, Emel and Roberts (1995), who empirically analyze community, government, and private forms of resource management and resource depletion regarding water in the southern high plains, find that policies change across space. Their work has implications on policy studies by highlighting the importance of scale. This dissertation is also concerned with scale in that policy is created for the nation in Washington, D.C., but applied in many different locations, whereby regions that have different physical and human landscapes
are not accounted for at the federal level. Also within environmental history and geography is the emergence of moral geography. Historian John Opie (1998) describes moral geography as that which “takes hold when government policy identifies a geographic landscape and its inhabitants in need and deliberately responds to that region.” (Opie 1998; 242). In his study of the High Plains as a moral geography, he claims that the people and environment of the region represent a “public responsibility,” a similar claim that could also be made for the Delta. Opie also delves into issues of agricultural parity and the role of agricultural subsidies as detractors from economic prosperity.

Not only were the government programs detrimental to the environment and economy, but they were also harmful to many of the rural residents who were not of the planter class. Lewis Gray (1932), a USDA economist who wrote a thorough history of antebellum southern agriculture, admitted that few benefits reached the disadvantaged population. Daniel (1985) quotes him as saying that, “although some of the benefits of these programs have tended to seep down to the disadvantaged groups, this process has not been extensive” (Daniel 1985; 241). Following the theme of C. Vann Woodward’s *The Irony of Southern History*, Daniel examines the inherent conflicts in federal agricultural policy in the South. “The irony of federal intrusion lay not in the fact that the government entered agriculture or that in the 1930s it took control of its planning. Rather, it created conflicting programs that largely ignored not only its own role and that of poor farmers but also that of technology” (Daniel 1985; 241). He provides further examples of irony. “The science arm of the USDA worked to create a new mode of production while its social agencies sifted through plans to prop up the old structure” (Daniel 1985; 241). “The AAA reduces crop acreage – the Extension Service taught
farmers how to grow more on fewer acres. Reduced acreage drove people from the land – the FSA [Farm Service Agency] attempted to resettle marginal farmers. Planters looked eagerly to government payments and diminished labor needs – the USDA tried to reform the tenure system in the South” (Daniel 1985; 245). Once mechanization occurred the USDA, agricultural schools, and the Extension Service gained attention and power. Again, Daniel notes class-bias in conservation-oriented information. However, as has been previously mentioned by Earle (1992), this may have been pseudo-conservation. “Yet the expertise only went to large farmers, and the USDA… ‘insisted that they had neither the know-how nor the resources to save the small farmer.’ In that sense the policies of the USDA had remained consistent during the years of changes in the rural South” (Daniel 1985; 253). Daniel concludes by saying that, given the contradictory policies and their focus on the small number of wealthy landowners while relegating the other to exclusion of policy benefits, “Larger farms, mammoth implements, killer chemicals, and government intrusion were not inevitable” (Daniel 296). Literature about government programs consistently indicts the USDA for its policies, which yielded continued wealth for the wealthy and persistent deprivation for the already deprived. This process continues apace with current subsidies.

Policy’s Place in Geography. “The origins of the discipline of geography lie, simultaneously, in both conceptual and utilitarian inquiry. It is, therefore, a little surprising that the debate…the contribution of geography to policy formation and practice continues to resonate so intensely among practitioners” (Lee 2002; 627). However, the reality remains that “policy-making of one kind or another is a prominent and pervasive feature of modern society, affecting the daily lives of us all. As geographers we should be striving to inform and shape the process and improve the
outcomes” (Martin 2001; 190). David Smith (1997) claims that David Harvey (1992a and 1992b) initiated a new turn in geography toward ethical and moral concerns, hence the application of policy impact on socio-economically underrepresented populations. This sort of geography should not be allowed to escape the attention of practitioners, nor policy makers, nor the public at large. This is geography, the geography that is the critical social science, which will simultaneously promote the applicability and necessity of the discipline and contribute to debates that create, inform, and implement policy.

Current works in human geography turn to theorizing, more –isms, and what Ann Markusen identifies as “fuzzy studies” (Markusen 1999; 871). Although concepts such as globalization and sustainability can contribute to understanding the agricultural landscape of the Mississippi Delta and its relationship to economic development in the region, the federal government’s concrete role (that of a dominating agency) in this landscape has been neglected and therefore requires attention, not only for academic understanding, but most importantly to communicate with legislative powers through clearly written, statistically supportive, and cartographically displayed information.

Many academics shy away from political engagement. Though maintaining neutrality and objectivity in research is requisite of academic accountability, a disregard of social responsibility is unacceptable especially when the researcher and the discipline possess the tools to benefit and empower society. These tools to affect change are rooted in geography and agricultural policy is a subject ripe with possibility for insights and answers provided by a geographic perspective. Geographers tend to focus on several areas of study that inform, but are not focused on, the subject of this proposed dissertation. Agricultural, rural, historical, environmental, and political geography have all touched on aspects that inform existing literature about the spatial relationships
between agricultural policy and the human landscape. However, the subject of this dissertation is an unanswered question that when answered has potential application for policy change at a national level and implementation in local areas that desperately need assistance. Geographers, with tools from qualitative and quantitative geography, in addition to training in the mapping sciences, have a unique opportunity to study, analyze, and communicate the possible undisclosed relationships. Indeed, Richard Peet, in posing the question why the geography of American poverty has been such an under-researched topic, states, “The serious imbalance in the geography of income in North America is a problem exactly suited to spatial analysis” (Peet 1971; 99). Poverty is only one of a number of problematic social themes that would be well-served by geographic insight and would further serve to inform geographically sensitive policy (Berry 1994).

Policy implementation by various agencies has a fundamental influence on an area’s geography, both physically and culturally. Therefore, a geographic perspective could well serve policy formation (Hoggart 1996; Marsden 1998). Unfortunately, however, geographers rarely provide and policy makers seldom draw on a geographic perspective. Although Martin (2001) feels an academic bias seems to exist against policy research, he claims that

the past two decades have seen a wholesale rethinking and reworking of public policy, and have provided geographers with a major opportunity to enter and help shape the policy debate. Yet, disappointingly, the impact of geography on the policy realm has been limited. Increasingly, it seems, other social, political, and environmental scientists, and even media pundits, shape public perception and government policy in areas where we geographers could – indeed should – be having much greater influence. (Martin 2001; 189)

In addition, Markusen states, “Greater commitment to entering the policy debate and to making results accessible and informative to real world political activists and
planners…would substantially strengthen this body of research and its usefulness” (Markusen 1999; 870).

William Bailey (1978) states that “Geographers who seek an understanding of the arrangement of agricultural land use should be aware of the influence of government policy on farmers’ decisions” (93). Due to the opening of world markets, many countries can provide lower-cost and at least equal quality crops (like cotton) to the U.S. However, U.S. producers cannot compete with these low costs (due to equipment expenditures, taxes, and pesticide costs to name but a few factors), so the federal government supports domestic production. For those farmers who want to get out of crop production, the government provides programs to help them with this too. Different policies result in guiding land use in varying directions, which then influences the economy, society, and environment at a local scale. Therefore, understanding the impacts of federal policies on local landscapes might provide insight into economic, social, and environmental characteristics of these areas. However,

the relative neglect of the state's role in regional development exacerbates the distance between theory, research and policy. Uneven regional development continues apace, and state policies contribute to it in some cases, ameliorate it in others, but current policies (and policy lapses) are less often the focus of analysis than they were in the 1970s and early 1980s (Markusen 1999; 874).

For geographers then, “a primary objective must be to demonstrate the crucial difference that place makes in the construction, implementation, and impact of public policy… for (e)ven nonspatial policy has spatial elements” (Martin 2001; 203).

Geographers have contributed to policy, some in profound ways. The most notable of these academics is Hugh Hammond Bennett, considered the Father of Soil Conservation. Though Bennett was a geographer and president of the Association of
American Geographers, his notoriety is through his influence on conservation policy. He created and led the Soil Conservation Service from the 1930s through the early 1950s and through this position radically altered the way farmers attend to soil conservation (Bennett 1921, 1943). In addition to Bennett, other geographers have contributed to policy, yet with less national prominence.

In his review of geographers’ influence in policy formation J.T. Coppock (1974) notes the work of Gilbert White (1973), W.L. Garrison (1956), I. Burton and R.W. Kates (1964), R.W. Kates (1962), and W.R.D. Sewell (1971). Furthermore, in this special edition of the *Transactions of the Institute of British Geographers*, the entire publication was centered on geography and public policy. In that issue, David Harvey writes that when geographers consider undertaking research of public policy they should question, “what kind of geography and what kind of policy” (Harvey 1974; 18). He proposes that interests of the state might interfere with the more purely academic pursuits of a professional geographer and that the consideration should not be made lightly. This dissertation extends beyond this concern by offering a critique of policy and providing suggestions for improvement. Furthermore, this research is not funded by any government source or any related interest.

“If we do not seek to demonstrate our skills more actively, we shall increasingly find that the opportunities are no longer open to us and that other disciplines will fill the roles which we are well qualified to fill” (Coppock 1974; 1). Why are geographers not visible in policy research? According to Coppock (1974) the reasons are as follows: the discipline as a whole has shown a lack of interest when opportunity presents itself, the work that is done on policy is unlikely to be application-oriented, and this work seldom offers answers or provides approaches to the problem at hand. “Even those who do not
wish to participate must surely recognize that there is virtually no aspect of contemporary geography which is not affected to some degree by public policy. Understanding policies and processes of decision-making is thus essential to an understanding of the contemporary geography” (Coppock 1974; 5). He asserts geographers’ work would benefit policy analysis because geographers have a “broad awareness” inherent in the discipline’s holistic approach to studying phenomena of the world along with their “ability to analyse the spatial dimensions of environmental problems and, more particularly, to handle, analyse, and interpret spatially distributed data” (Coppock 1974; 5). In acknowledgement of the reasonable trepidation on the part of academics contemplating policy research Coppock (1974) states the following, “Fears have also been expressed that applied research which is policy-oriented will be harmful to the profession, distorting academic judgments and prostituting the profession” (Coppock 1974; 8). In response to the criticisms of geographers prostituting the discipline by being involved in policy research, as suggested by Harvey (1974), Kenneth Hare declares that, “I lose little sleep about the fate of geography as a discipline, or of any other discipline. They can look after themselves. The pursuit of pure understanding is not really challenged, and will always attract able people. But I do worry greatly about what seems to be our poor performance as individuals in the policy area” (Hare 1974; 28). However, Edwin Brooks follows Hare’s work by again mentioning the conflict inherent in scholars engaging with policy research, for “as long as we have stratified societies, we cannot, in principle, avoid the taking of sides in the advocacy of any particular policy” (Brooks 1974; 31). Bridget Leach (1974) then reasserts the necessity of geographers in policy research, especially in the area of racial injustice, or what she calls “spatial injustice” that is racially disparate. She quotes A.T. Blowers (1972), “For the ‘identification of the
patterns of social inequality is an essential first stage in the process of its eradication” (Leach 1974; 44). Peter Hall (1974) completes this series of papers on geography, geographers, and public policy by stating that a new political geography exists that blends theories of political science and theories of human geography. Power relationships exist in any space shared by people and it is this fundamental characteristic that is central to studying public policy from a geographical perspective.

The same space may have different types of values for different groups of the public: for instance, the line of a proposed motorway may represent accessibility by car for one groups (motoring organizations), the destruction of symbolic old buildings for another (amenity societies), severance and destruction of a community for another (local residents), jobs for another (contractors). These groups hold their values with varying strengths, they have different access to political power, and they are of different size (Hall 1974; 51).

Hall’s example is helpful in setting the scene for agricultural policy in the Delta. This type of policy affects more than just the cropland, but rural areas in general. In this space the cotton lobby and cotton farmers are small in number (in comparison to the residents of the area) but possess the power to influence policy. A decision that this group perceives as favorable to their interests (such as continued government dependence on subsidies) may be seen as having negative consequences for others that share this space.

More recently, Keith Hoggart (1996), has reviewed the types of policy research undertaken by geographers in the mid to late 1990s and has identified four specialties within policy studies that are focused upon by academics: “growth promotion, social justice, efficiency (or if you like effective allocational policy), and control” (Hoggart 1996; 110). He proclaims a need to include the variable of politics in policy analysis.

If we simply take public policies as given and devote our attention to assessing effectiveness, efficiency, and impact, we produce an entity which inevitably leads to a rather lame theoretical vision; one that is unable to cast much light on why public policies change, how they are structured to advantage some and restrict the potential of others, or even what difference it all makes. (Hoggart 1996; 110)
Furthermore, he acknowledges the difficulty of undertaking policy analysis due to available data, methods of analysis, and timescale of research, which are represented by D. J. Briggs (1995), C. Peach and M. Byron (1994) and W. Z. Hirsh (1995), and geographers K. Tsey and S. D. Short (1995), J. R. Oppong and M. J. Hodgson (1994). Also, he supports the idea of the importance of scale in policy studies, a salient component of this dissertation. He states that “the literature makes clear that policy effects vary in line with political traditions and power structures; not simply at the national level, but also locally” (Hoggart 1996; 115). He also identifies the uncertainty of time scale in policy research. Through the example of Brown vs. Board of Education, Topeka, Kansas, he briefly summarizes the initial actions in response to school desegregation and the actions and resulting impacts that exist in present conditions, thereby making the point that one policy can have temporally varying impact, as it has geographically varying impact (Hoggart 1996; 111). He concludes with the following observation: “most work in this field is not undertaken by geographers, and geographical work has not carved out a particular niche for itself, even within the discipline. In truth, I am not sure that it should do so, for examinations of public policy are distinguished more by the topic under investigation than by any underlying philosophical or methodological perspective” (Hoggart 1996; 117).

In 1972 one of the most notable proponents of geographers’ participation in policy research, Gilbert White, asks “What shall it profit a profession if it fabricate a nifty discipline about the world while that world and the human spirit are degraded” (White 1972; 104)? He proposes adjustments in the Association of American Geographers and in academic institutions that would support the engagement of geographers and geography in issues of public and environmental policy. “Let it not be said that
geographers have become so habituated to talking about the world that they are reluctant to make themselves a vital instrument for changing the world” (White 1972; 103). Additionally, he criticizes the descriptive and radical works for their lack of applicability. “Little is to be gained by critically pointing fingers at white faces in textbooks, at vapid generalities about world power, or observations about resources and man that are perfectly true, perfectly general, perfectly useless” (White 1972; 104). As an additional critique of the discipline, he points out that for many topics undertaken by geographers, an oft-asked question is “but is it geography?” He suggests a shift in perspective on this point. “One of the common and commonly destructive questions about research runs “But is it geography?” I would like to see us substitute “Is it significant?” and “Are you competent to deal with it” (White 1972; 102)?

**Rural Sociology and Geography Converge.** As shown in the literature, geographers know that a spatial perspective is useful to the study of public policy in specific, but a spatial approach is a necessary component to the study of any human or physical phenomenon. This is the root of the discipline, not merely a trend. However, rural sociology has recently discovered society’s spatial aspect. In fact, in 2002 Linda Lobao and Rogelio Saenz declare, “The spatial aspects of social life have captured sociologists’ attention” (Lobao and Saenz 2002; 497). They have held the attention of geographers for much longer and surface dramatically in the 1960s radical geography response to the quantitative revolution. Furthermore, the authors identify spatial inequality as a “new specialty area” and the expedition of rural sociology into “the new frontier of geographic space” (Labao and Saenz 2002; 497). This situation raises the question of why this geographic literature has not, until recently, drawn the attention and collaboration of other social scientists? The possible answers to this question are beyond the scope of this
research, but speak to the necessity of geographers’ involvement in social issues outside the discipline.

Since spatial inequality has been discovered by rural sociologists and given this discipline’s salience to understanding rural poverty, agristucture, and policy, an overview of their discourse on spatial inequality is fitting. In 2002 the journal *Rural Sociology* published a special edition on spatial inequality. In this issue Labao and Saenz describe the power of a spatial approach to examine generalizations about areas so that diversity within these places may become evident as they also support the use of GIS as technology that “introduces new ways of conceptualizing research questions and analyzing data.” (Labao and Saenz 2002; 498) In essence, they acknowledge several areas where spatiality is important to emerging rural sociology: theory, research topics, and methods (GIS and spatial statistics). Furthermore, with the recognition of the power of location, rural sociologists are becoming aware of spatial and the associated locational historical contexts of their research. Geographers would be remiss to again allow another discipline to take the lead in geographic research.

Conclusion

Literature that is relevant to the relationship between agricultural subsidies and the Mississippi Delta comes from several research areas. Although the work of geographers has informed this topic, to confine a review to work from this discipline alone would do disservice to the breadth of information provided by scholars and agencies outside geography. From a theoretical perspective, works on uneven development, land tenure systems, and agricultural systems contribute a conceptual framework. More applied, less theoretical research from geography, history, rural sociology, and government agencies inform the foundation of this issue from historical
vantages as well as contribute to understanding its development and current status. An essential component to this research is the discussion of geography’s role in addressing policy issues, both from cases of applied research and from more purely discursive works on the tenuous dynamic between government and academia.
The specific purpose of this research is to analyze the relationship between large-scale agriculture, negative socioeconomic indicators, and federal agricultural subsidies in the Mississippi Delta. To provide a holistic research methodology, both quantitative and qualitative methods will be used, specifically Local Indicators of Spatial Autocorrelation (LISA), correlation, and interviews. This chapter will define the study area, explain variables, discuss the statistical calculations, and review the interview format.

Study Area

In general discussions the Delta is an amorphous region along the Mississippi River, but for the purpose of this study it must be defined formally. The focus of this research is on the relationship between plantation agriculture of the past and present and societal ills. Consequently, the formal region must encompass places that share the geographic, historical, and current characteristics under investigation. Since policy will figure prominently, examining how the government defines the Delta is a fitting starting point. Both the Delta Regional Authority (DRA) and the Lower Mississippi Delta Development Commission (LMDDC) have different definitions. The DRA contains 240 counties and parishes, including a group in the non-traditional Delta area of Alabama. These counties are a part of Alabama’s Black Belt where plantation agriculture did occur and where development problems continue today. The rest of the region centers on the Mississippi River from Illinois to coastal Louisiana. Clearly, the northern segment of this version does not express the historical agricultural roots or the present agristuctural conditions. The alternate government definition of the Delta is provided by the LMDDC. It identifies the area as 308 counties and parishes, including the all counties in the states of Arkansas, Louisiana, and Mississippi. Like the DRA’s territory, this definition seems
broad for the specific purposes of this study since all counties do not have a historical and present link to large-scale agriculture. However, since policy is central to this research, and the DRA is the government agency charged with implementing economic development in the region, its definition will be used (Figure 3.1). The counties in Alabama are not included due to their geographic separation from the contiguous delta region. The discontinuous nature of these counties prohibits analysis through LISA calculations. Arkansas County, Arkansas is also removed from the analysis. Confidentiality requirements on agricultural data state that the information about agriculture in the county cannot identify an individual. Data for this county does not meet the federal requirement, thus it is excluded. Although estimation methods for the county could be employed, removing areas with missing values is an accepted method for addressing the problem (Bennett et al. 1984; 141). The qualifying DRA region is mapped and analyzed using the following variables and methodology.

Study Period

Farm subsidies have been a fixture in American agriculture since the advent of the Agricultural Adjustment Acts, but have expanded and contracted during the past seventy years. The 1985 Farm Bill defines the current form of payment for production. This legislation was created to help farmers recover from the difficult financial times of the 1970s and early 1980s. The payment design was to help family farmers, yet it has also enabled large-scale operations to gain wealth and further increase their size. These circumstances have been destructive to some rural communities (Lobao and Schulman 1991). Due to the implementation of a new subsidization policy in 1985, and interest in temporal spatial stability of these variables from initiation until the present, the study period extends from 1985-2000. Given the research question, study period, and study
area, the data sets to be used are as follows: per capita subsidy payments per county are collected from the U.S. Census of Agriculture for the years 1987 (the first year the subsidies were calculated in this census), 1992, and 1997. Data for 2002 had been released as of 2004, yet U.S. Department of Agriculture (USDA) officials note that changes in data collection methods render 2000 data incompatible for some variables. To avoid discrepancies and because the agricultural data spans the years 1987-1997, which makes it comparable to the socio-economic data and suitable for the current research question, 2000 data have been excluded. The corresponding data for socio-economic indicators come from the U.S. Census Bureau decennial censuses of 1980, 1990, and 2000. Though outside the study period, data from 1980 is included in order to show values’ temporal stability. For example, agriculture and subsidy data exist for 1987,
1992, and 1997. Three time periods of values allows more confidence in clusters that are identified if they exist for each collection year. Socio-economic data should have a comparable time scale to allow for temporal comparison among the three datasets.

Variables

Three sets of variables will be correlated spatially to determine the relationship between agristucture, socioeconomic well-being, and farm subsidies. Agristucture is a measure using accepted variables developed by Ronald Wimberley (1987) and expanded upon by John Thomas et al. (1996); societal variables derive from the work of Linda Lobao and Michael Schulamn (1991) and Linda Reif (1987). The U. S. Department of Agriculture (USDA) provides data on subsidy income per county. No precedent exists for use of this last variable because this dissertation is the first analysis linking subsidy income to agristucture and socio-economic well-being.

Originally, Goldschmidt (1978) utilized single variables to delineate areas into agristucture classifications such as small family farm area, mixed farming area, large-scale farming area. For example, he would classify an area as large-scale farming if the average farm size exceeded a certain value. This would be the only variable he used to determine an area’s agristucture. However, Wimberley (1987) claims that individual variables provide a simplistic view of structural establishment and that multiple indicators should be used to create a multi-dimensional agristucture index. Utilizing factor analysis he identifies several dimensions that are salient to an area’s agristucture. Average farm size is not enough to claim an area has a certain type of agristucture; variables that describe sales, amount of capital investment, and labor characteristics are but a few of the additional considerations. “Indexes based on…dimensions are useful for describing more comprehensive patterns of U. S. agristucture cross-sectionally, for
conducting trend analyses, and for measuring structure in causal models” (Wimberley 1987; 445). Variables to be evaluated can be divided into those that describe the scale of operation, type of ownership, tenure, operator, and labor (Wimberley 1987; 448) (Table 3.1).

Of the measurements listed in Table 3.1, the majority is suitable for the present study. This group was compiled with national analyses in mind and their suitability for regional investigation of the Mississippi Delta needs revisiting. Their appropriateness for analysis with LISA and correlation techniques must also be critiqued. Regarding their use for the region, most of the variables provide their intended measurement. For example, variation will be seen in average farm size because it varies from significantly large in the central Delta while decreasing in urban areas and where the topography and soils are less suited for large-scale row-cropping. Thus, this variable will indicate the scale of agristructure in the various counties. Only three out of the twenty suggested variables are inappropriate measures for farm structure in the Delta: number of partnerships, number of part owners, and mean age of farmers in each county. Neither the number of partnerships nor the number of part owners is a characteristic associated with either large-scale or small-scale agristructure. Since the research question is specific to large-scale farm operations, these variables do not provide a suitable measurement. Rather, the number of full owners versus tenants and the number of individual owners versus corporate owners in each county provides the most appropriate indicator of ownership and operator characteristics for the correlation analysis. The mean age of farmers in each county is the third variable that is not directly related to agristructure in the Delta. This variable is not related to large or small-scale operations in the study area, hence it is not useful to the investigation. These variables are stark reminders that
existing data sets are not always applicable to current research due to variation in the specific research question and in the scale of analysis.

Table 3.1 Agristructure variables

<table>
<thead>
<tr>
<th>Scale:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Farms (N)</td>
<td></td>
</tr>
<tr>
<td>Land in farms (% in county)</td>
<td></td>
</tr>
<tr>
<td>Mean farm size (acres)</td>
<td></td>
</tr>
<tr>
<td>Small farms (N&lt;$2,500 in sales)</td>
<td></td>
</tr>
<tr>
<td>Gross sales ($)</td>
<td></td>
</tr>
<tr>
<td>Farm real estate value ($)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ownership:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual family (N)</td>
<td></td>
</tr>
<tr>
<td>Partnership (N)</td>
<td></td>
</tr>
<tr>
<td>Corporation (N)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Full owner (N)</td>
<td></td>
</tr>
<tr>
<td>Part owner (N)</td>
<td></td>
</tr>
<tr>
<td>Tenant (N)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operator characteristics:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-farm work (N)</td>
<td></td>
</tr>
<tr>
<td>Farm resident (N)</td>
<td></td>
</tr>
<tr>
<td>Mean age (yrs.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labor resources:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Farms with hired workers (N)</td>
<td></td>
</tr>
<tr>
<td>Hired workers (N)</td>
<td></td>
</tr>
<tr>
<td>Contract labor expenses ($)</td>
<td></td>
</tr>
<tr>
<td>Custom work expenses ($)</td>
<td></td>
</tr>
<tr>
<td>Machine / equipment value ($)</td>
<td></td>
</tr>
</tbody>
</table>

(Thomas et al. 1996; 356, Wimberley 1987; 448)

Linda Lobao and Michael Schulman (1991) and Linda Reif (1987) have expanded Wimberley’s analysis of agristructure to its relationship with community socio-economic well-being. Like Wimberley and Thomas, they create a multivariate approach to studying social equality, economic dependency on agriculture, and economic well-being of the population as a whole (Table 3.2). Again, these variables must be evaluated for their utility in this research question. Five of the twelve suggested measurements required adjustment, following their derivation from a national factor analysis approach. For variables that measure social equality, percent non-white and percent unemployed suit the present analysis.
Table 3.2 Socio-economic variables

<table>
<thead>
<tr>
<th>Socio-economic well-being indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social equality:</strong></td>
</tr>
<tr>
<td>Percent nonwhite</td>
</tr>
<tr>
<td>Percent unemployed</td>
</tr>
<tr>
<td>Median school years</td>
</tr>
<tr>
<td>Unionization rates</td>
</tr>
<tr>
<td>Average monthly AFDC payments per capita</td>
</tr>
<tr>
<td><strong>Economic dependency on agriculture:</strong></td>
</tr>
<tr>
<td>Percent urbanized</td>
</tr>
<tr>
<td>Percent of rural farm population of total rural population</td>
</tr>
<tr>
<td>Proximity to metropolitan areas</td>
</tr>
<tr>
<td><strong>Economic well-being:</strong></td>
</tr>
<tr>
<td>Median family income</td>
</tr>
<tr>
<td>Percentage of families in poverty</td>
</tr>
<tr>
<td>Gini coefficient for family income inequality</td>
</tr>
<tr>
<td>Size of business establishments</td>
</tr>
</tbody>
</table>

(Lobao and Schulman 1991, Reif 1987)

However, the U.S. Census does not consistently measure the variable “median school years” for the study period. Therefore, a measure that consistently indicates the county population’s education level is the percentage of high school graduates. This indicator substitutes for median school years. In addition, unionization rates vary from place to place, making this subject one that has implications for community well-being throughout the country. Within the south, though, this variable yields little insight, mainly because the region lacks significant unionized labor. Also, payments made through Aid to Families with Dependent Children (AFDC) are a suggested measurement for community well-being. However, the qualifications and available benefits vary by state, thus making this variable ill-suited for a multi-state analysis. Utilizing food stamp recipients as a proxy for the AFDC measurement makes sense for this study since it is
also a measure of socio-economic well-being, yet is comparable across state boundaries (Nord 1997; 50). Additionally, Lobao and Schulman (1991) and Reif (1987) use proximity to metropolitan area as a measurement of a county’s economic dependency on agriculture. They employ Beale Codes, also known as Rural-Urban Continuum Codes, as the indicator. Beale Codes were created in the 1970s as a way to measure a county’s degree of urbanity. Over the past thirty years, the codes have been modified and were most recently updated in 2003. Table 3.3 provides a list of the codes and their meaning. The ordinal scale of this variable is not suitable for LISA analysis, therefore it can not be included in the cluster maps nor the final correlation. Furthermore, proximity to urban areas is a variable that is not useful using Beale Codes alone. Questions of the relationship between proximity to urban areas and community well-being must take into account highway locations, public transportation access, and census data on availability of private transport in the home. Distance proximity is not a realistic indicator because space alone does not determine how far away something is from a person. Access to the means to cover the distance is at least as important as the distance itself. Finally, for Gini coefficient and size of business establishments, average wage per job and number of

Table 3.3 Beale Codes

<table>
<thead>
<tr>
<th>Beale Code</th>
<th>Population type</th>
<th>Population size</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Urban</td>
<td>At least 1 million</td>
<td>In metro area</td>
</tr>
<tr>
<td>2</td>
<td>Urban</td>
<td>250,000 - 1 million</td>
<td>In metro area</td>
</tr>
<tr>
<td>3</td>
<td>Urban</td>
<td>Less than 250,000</td>
<td>In metro area</td>
</tr>
<tr>
<td>Non-metro:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Urban</td>
<td>At least 20,000</td>
<td>Adjacent to metro area</td>
</tr>
<tr>
<td>5</td>
<td>Urban</td>
<td>At least 20,000</td>
<td>Not adjacent to metro area</td>
</tr>
<tr>
<td>6</td>
<td>Urban</td>
<td>2,500 - 19,999</td>
<td>Adjacent to metro area</td>
</tr>
<tr>
<td>7</td>
<td>Urban</td>
<td>2,500 - 19,999</td>
<td>Not adjacent to metro area</td>
</tr>
<tr>
<td>8</td>
<td>Some urban or completely rural</td>
<td>Less than 2,500 urban</td>
<td>Adjacent to metro area</td>
</tr>
<tr>
<td>9</td>
<td>Some urban or completely rural</td>
<td>Less than 2,500 urban</td>
<td>Not adjacent to metro area</td>
</tr>
</tbody>
</table>

(Economic Research Service 2005)
establishments per capita are substituted as economic well-being measures. The Gini coefficient is redundant in light of the other variables that inherently illuminate disparity in each county, while the average size of business establishments says little about economic well-being in comparison to the number of establishments and average wage per job. In fact, the number of establishments per capita reflects the original Goldschmidt hypothesis which proved that fewer establishments exist where large-scale agriculture prevails.

The government regularly measures these variables and makes them available for public use. They enable the measurement of the spatial relationship of subsidies to agriculture and socio-economic well-being. Although these data are readily available, their scale is limited to the county level. Data for some characteristics exist at a finer scale, but in order to maintain consistency in analysis among variables and to permit comparison, the county unit is the most suitable level for analysis.

The analytical quality of these data depends upon methods of collection and their consistency in time period and scale. Data from the Census of Agriculture is highly reliable. Every five years the USDA mails a census form to each farmer and rancher in the country. By law, each must respond accurately and within a specified time. The resulting information is available at the county scale for each year ending in two or seven (i.e. 1982, 1987, 1992, 1997, 2002). The USDA also collects data on specific government programs, such as acres enrolled and payments made, for each year of the program’s existence. The U.S Census provides a second data source. Like the USDA, the Census Bureau mails questionnaires, however, participation is not required. In addition, the Census Bureau employs methods to interpolate results. Therefore, it is not a complete picture of the population. Variables utilized in this research have been proven
useful in identifying county-level agricultural structure and socio-economic status. They are appropriate for both the scale and topic of this study.

Statistical Calculations

Scholars in rural sociology have applied descriptive statistics, regression analysis, and factor analysis to agristructure and rural communities (Lobao and Saenz 2002, Wimberley 1987, Lobao and Schulman 1991, Reif 1987, Thomas et al. 1996). Recognizing the importance of spatial relationships, some researchers have adopted mapping. Nonetheless, more sophisticated and insightful spatial techniques have not been widely applied to this subject. To advance this literature and to investigate the proposed hypothesis this dissertation will create univariate surfaces based on the individual salient variables. Advanced spatial statistics, in the form of Local Moran’s I, will identify clusters of large-scale agristructure, high subsidy income, and social poverty. Basic spatial correlation will relate the locations of significant values of these variables to one another. This combination of methods enables visualization of several patterns: clusters for each variable in each year within the study period, the composite pattern for each variable representing the overall time period, and the correlations that exist among these maps. For example, clusters of high poverty rates can be visualized as individual maps for 1980, 1990, and 2000 and can also be viewed as an aggregate map displaying all counties that have high poverty rates for all three years. Finally, a composite map of all significant socio-economic indicators can be visualized, including poverty. This last graphic has utility in that it allows comparison of each variable with its larger data set, i.e. poverty with all negative socio-economic indicators. This output relies upon advanced spatial analysis to find significant clusters of these characteristics
The Local Indicator of Spatial Autocorrelation (LISA) statistic will be applied. For this research, the univariate LISA is useful in visually and statistically identifying clusters of each variable. Then, the variables, classified by statistical significance, will be displayed as diverging color scheme maps, with clusters of high positive and high negative values. These values will be incorporated into a multivariate index wherein a range exists from positive values (counties in hot spots) scored as a 1 and negative values (cold spots) with −1. Spearman’s correlation coefficient ($r_s$) will provide a statistical description of the correlation among the indexed variables at temporal and spatial scales. Used together, these techniques provide different perspectives about the data and represent a well-rounded mapping and quantitative approach.

Mapping variables provides a visual way to understand the spatial distribution of data and the relationships that variables have with one another. “Many geographic studies involve mapping variables and determining the degree of relationship between two or more map patterns” (McGrew and Monroe 2000; 193). This method of mapping followed by correlation is explained in the following example. A hypothetical map is presented showing variables of poverty rate and average farm size. Though they may appear to be occurring in similar areas, it takes correlation analysis to know for sure. (Figure 3.3). This description, though, is general and does not utilize the power of more detailed information provided by spatial statistics. Using a statistical technique allows further insight. “Correlation analysis provides a more objective, quantitative means to measure the association between a pair of spatial variables. Both the direction and strength of association between the two variables can be determined statistically” (McGrew and Monroe 2000; 193). Again, with the example of poverty rates and average farm size, correlation analysis provides statistical information about the spatial
relationship between the variables (Figure 3.2). Using Spearman’s correlation coefficient, the strength and direction of the relationship between choropleth maps can be quantified. “Spearman’s rank correlation coefficient (\( r_s \)) is the most widely used measure of the strength of association between two variables. It is appropriate when (1) variables are measured on an ordinal (ranked) scale, or (2) interval/ration data are converted to ranks” (McGrew and Monroe 2000; 201). A value of 1 represents a strong positive relationship, -1 is a strong negative relationship, and 0 is no relationship. In the example, the coefficient is .9833, which means a strong positive relationship exists for places where a certain poverty level is found; the corresponding level of average farm size also will be found. In this dissertation, the choropleth maps and the LISA are univariate; consequently the use of Spearman’s correlation is an option that integrates the multivariate statistical measure of relationship with mapping output.

Spearman’s correlation measures association between variables at the scale of its map or rank, depending on the data format, yet it can still overgeneralize the spatial relationships that exist in an area. For example, when poverty rates and average farm size are shown to have a strong positive relationship, that relationship may be stronger in some sections than others. Yet, one number (\( r = .9833 \)) describes the relationship. Many statistical techniques fall to the same criticism of overgeneralization, a situation that has prompted attention toward local statistics. Fotheringham and his associates (2000) propose that “the question spatial analysts need to address is: ‘Are there similar spatial variations in analytical results which are being hidden by global statistics’” (Fotheringham et al. 2000; 93). The answer to this question is “yes.” Recently, therefore, local statistics have been developed (Fotheringham 2000). “The movement encompasses the dissection of global statistics into their local constituents; the
concentration on local exceptions rather than the search for global regularities; and the production of local or mappable statistics rather than on global or ‘whole-map’ values” (Openshaw et al. 1987; 359).

Figure 3.2 Example of using correlation with univariate maps

“Traditionally, spatial models and methods of spatial analysis have been applied at a ‘global’ level, meaning that one set of results is generated from the analysis and these results, representing one set of relationships, are assumed to apply equally across the study region” (Fotheringham et al. 2000; 93). However, because heterogeneity exists at scales within a region, assuming that one statistical finding represents the region is to overlook more detailed spatial relationships. “The recent interest in the ‘local’ rather than the ‘global’ in quantitative geography is notable for several reasons,” states
Fotheringham and associates (Fotheringham et al. 2000; 129). This reformulation addresses the critique of quantitative geography that it is only interested in identifying generalization and not in highlighting local exceptions, integrates the power of GIS mapping with the spatial statistics, provides additional methods for exploratory data analysis (EDA), and creates a new framework for further development of local spatial statistics (Fotheringham et al. 2000; 129). Spatial analysis of the Delta benefits from these advances because local statistics will provide analysis of each individual county in comparison with its neighbors and the region as a whole. In essence, the results will be more robust and show variation within the region rather than just one regional description.

One useful measure of spatial relationships, which has both global and local constituents, is spatial autocorrelation.

Spatial autocorrelation is traditionally measured globally so that the statistic describes an average trend in the way a variable is distributed over space. Where spatial data are distributed so that high values are generally located near to other high values and low values are generally located near to other low values, the data are said to exhibit positive spatial autocorrelation. Where data are distributed such that high and low values are generally located near each other, the data are said to exhibit negative spatial autocorrelation. Clearly these descriptions are global ones and may not adequately describe the relationship in all parts of the study area. (Fotheringham et al., 2000; 101)

Tobler’s first law states that near things are more related than things farther away. Spatial autocorrelation provides coefficients that make this law quantifiable, measured by Moran’s I, Geary’s C, or Ripley’s K. These are global statistics that, for an area, generate a number that indicates positive, negative, or random spatial autocorrelation. Moran’s I is the best-suited application for area data, which is the primary type of information for
this dissertation, consequently the local constituent of this tool (Local Moran’s I) is the statistic of choice.

Moran’s I (Moran 1950) is a weighted correlation coefficient used to detect departures from spatial randomness. Departures from randomness indicate spatial patterns, such as clusters. The statistic may identify other kinds of patterns such as geographic trends. Traditionally, Moran’s I tests for global spatial autocorrelation in group-level data. Positive spatial autocorrelation means that nearby areas have similar rates, indicating global spatial clustering. Nearby areas have similar rates when their populations are alike. When rates in nearby areas are similar, Moran’s I will be large (near 1) and positive. When rates are dissimilar, Moran’s I will be negative. This statistic requires full enumeration of the connections among the observations, which may be a problem when the number of areas becomes large, but this is not the case for the Delta.

Local Indicators of Spatial Autocorrelation (LISA) statistics, such as the local Moran’s I developed by Luc Anselin (1995), can be run in programs that deal with point data, such as CrimeStat, but for county level data it is easier to use the software developed by Luc Anselin, GeoDa, because it requires fewer steps for preparation of zonal (areal) data and is more compatible with ArcView. Also, this program provides, in addition to the Z-value map given by CrimeStat, a significance map to help clarify the meaning of the coefficients and a Moran’s I Scatterplot to graphically represent the autocorrelation of raw values and their spatially weighted counterparts (Figure A-3). The graph is divided into four quadrants: upper right for high values next to high values, and lower left for low values next to low values, while the upper left and lower right
quadrants are for points that do not have spatial autocorrelation. This visual representation of data provides the regression line and exposes any outliers in the dataset.

Local Moran’s I compares the central unit with its neighbors, therefore, defining the “neighborhood” is important to the analysis outcome. Generally, a first order (areas sharing a boundary with the central unit), second order (areas sharing a border with first order neighbors of the central unit), or third order (areas sharing a border with second order neighbors of the central unit) definition is acceptable in addition to straight distance measurements (Figure 3.3). To identify the tightest clusters, the most stringent neighborhood definition is required. As the neighborhood is defined by larger contiguity measurements, larger areas are included in clusters. In addition, rook neighbors create a smaller possible cluster area than queen. In this case, the term rook describes counties that share an entire border with one another, while the term queen pertains to counties where only a corner is in common (Figure 3.3). Hence, first order rook neighborhoods provide a more stringent hot spot definition and are less likely to identify weak clusters. For these reasons, a first order rook contiguity is the neighborhood definition for this study.

Values are converted to spatially weighted rates and the program uses these data to, one at a time, identify hot spots, cold spots, and spatial outliers as well as to calculate the significance of these results. With the previously mentioned variables, a local Moran’s I can be applied and the outcomes mapped. The result of this procedure tests the hypothesis that an area displaying a significant (.05 or .01) cluster of subsidy income will be a similar area to that which has a significant cluster for large-scale agriculture and other negative social and economic characteristics. Measures of correlation and spatial autocorrelation provide valuable insight into the spatial distribution of variables and
their relationships with themselves and with others. The techniques are applied to this research in the following methodology: interval/ratio data are collected for each of the variables for each of the pertinent years, LISA is applied to each variable in each year resulting in seventy-two cluster maps. Counties that score significantly high and low for the variables under investigation are assigned a value from –1 to 1 in order to create an index for each of the main categories: agristructure, socioeconomic level, and subsidy income. Creating an index is a useful tool when many variables need to be added to yield a single score. According to the Appalachian Regional Commission (ARC), the Appalachian equivalent to the Delta’s DRA, this method’s utility for identifying “counties in distress” comes from its ability to combine many economic development
indicators into one output (ARC 2005). The indices for this investigation were created as follows: each variable in each year scored as either part of a hot spot, a cold spot, not significant, or as an outlier. For each year a county was part of a hot spot it was given one point, for cold spots a negative one, if not significant it was zero, and outliers that were significantly high, but next to a cold spot received a .5, while outliers that were significantly low next to high values received a -.5. These values were calculated for each variable in each measurement year for agristucture, subsidy income, and socio-economic indicators. The aggregated values were then ranked and those indicating significant clusters for at least two out of the three measurement years were included in the composite map for the related data set. Designation for inclusion was not random. This scheme was chosen due to its ability to identify places with both temporal and spatial stability in significant values for the variables under investigation. This index of values for each group allows the creation of composite maps that are correlated to one another to test the hypothesis of a strong positive spatial relationship between the three data sets.

Interviews

Statistical methods certainly provide insight into the policy impact of an area, however, the understanding of a phenomena is inherently limited when not paired with input from people in the study area. John Fraser Hart (1982) states that,

I suspect most good geography of any stripe begins by looking. We start with the things we see, the visible features of the earth’s surface - the form of the land, the vegetation that cloaks it, and the structures that people have added. Our search for understanding quickly transcends these visible physical features, however, and we attempt to get inside the minds of people, because we cannot be satisfied until we understand the values that motivate their behavior. (Hart 1982; 1)
Given the limitation of quantitative analysis to explain behavior, “multi-methods” must be employed to gain a more robust understanding and understanding at a finer scale than that provided by the secondary data, or as Findlay and Li (1997) promote, “we want to be flexible in adopting methodologies that permit us as researchers to engage with ‘the multiplicities in our ways of seeing’” (Findlay and Li 1999; 57). The use of multi-methods allows this breadth of seeing and understanding.

Multi-method research is an attempt to combine research methods to address a particular research problem. It is a generic term that encompasses a wide range of research strategies: it may be deployed strategically; it may be used over the course of a research project; and it may breach the qualitative /quantitative divide or it may be practiced within each camp. (McKendrick 1999) Its employment in the proposed dissertation is primarily to: (1) bridge the qualitative /quantitative divide in order to allow both sets of information to inform one another and yield a more holistic understanding of the research problem, and (2) provide replicable, statistically significant, and visible results that are clearly communicable to policymakers.

John McKendrick (1999) notes a “tactical deployment” of multi-methods is to “gain the confidence of an audience” (McKendrick 1999; 42). He then cites McLafferty (1995) who argued, “policymakers tend to be more wary of conclusions drawn from small sample, in-depth qualitative investigations, although qualitative data is gaining credibility amongst some policymakers” (McKendrick 1999; 42). This dissertation is a policy assessment meant to affect policy change with the findings directed at policymakers. Therefore, a multi-method approach, composed of quantitative spatial statistics and qualitative interviews, is appropriate.

Although global forces are at work on the landscape, at the heart of policy implementation is the people who implement it on their land and, indirectly, the people who live on or near this land. No two humans are the same; therefore talking with them
to learn their motivations is essential to understand the maps and the statistics. In order to inform the statistical findings, interviews of landowners, agricultural extension agents, corporate executives with agribusiness companies planting in the Delta, and heads of various social and economic development organizations were conducted to inform the maps. “Unstructured interviews” were conducted, to complement other research methods. “The unstructured interview is rarely conducted in isolation; it is often part of a broader programme of research and draws on the knowledge that the researcher has of a social situation” (Burgess 1984; 106). This method is both traditional and has been proven useful. Robert Burgess (1984) states, “there is a long tradition in social science research where interviews have been perceived as ‘conversations with a purpose’” (Burgess 1984; 102). Furthermore, additional work relates the effectiveness of the unstructured interview as opposed to a structured question and answer approach (Webb and Webb 1932, Zweig 1948). The multi-method approach of applying statistical analysis with unstructured interviews is thus suitable for this dissertation.

Interviews with county agents of the Extension Service provide expert insight into the mechanics of government crop subsidies and local knowledge about how they are implemented in each county. In their comparative study of farm programs and structural change, Pfeffer and Gilbert (1989) used interviews with these government representatives to gain “firsthand information” on the situations in each study county. This method was also used in prior work in the Delta and has proved an invaluable method for otherwise inaccessible information about the agricultural environment of the county (Mills 2000). It should be understood, however, that these informants are representatives of the government and that their job is to assist the farming community. Therefore, eliciting responses that link their programs to economic deprivation is unlikely. The Louisiana
State University (LSU) Internal Review Board (IRB) expects the data collected in interviews to remain confidential and anonymous in order to protect the interviewees. Following this stipulation, all information gathered in interviews will be aggregated for general support or questioning of the statistical results.

Statistical results guided the selection of interviewees. Counties are in one of several categories based on the LISA output and composite maps. Either they are not significant, part of hot spots, part of cold spots, or significant outliers. A representative sampling scheme provides input from contacts in the identified groups of counties. The following chapter provides a more detailed explanation of sampling and county groups.

After selection, interviews were collected in person, over the phone, or by mail/ e-mail, depending on the flexibility of schedules. The general objectives are to understand the argument for farm subsidies, if experts acknowledge a relationship with subsidies, corporate farms, poor community well-being, and if agriculture is believed to have any role in economic development situation in the Delta. The information gathered from the interviews was then aggregated to demonstrate views of these experts in the areas identified by the quantitative analysis: counties with large-scale agriculture, high subsidies, poor communities; those with large scale agriculture, high subsidies, but without poor communities; only high subsidies and poor communities, but without large-scale agriculture; only high subsidies, only poor communities, and only large-scale agriculture. This information is descriptive and supplemental to the quantitative analysis. Though interviewees were chosen based on quantitative results, it should be noted that the formulation of the research question came from field observation and preliminary interviews, thus neither qualitative nor quantitative methods are directing the research by
themselves, but rather they work in concert to produce the questions, hypothesis, methods, results, and conclusions.
CHAPTER 4: RESULTS

Investigation of a research problem begins with observing, questioning those observations, hypothesizing reasons for what is seen, and testing the hypothesis. Years of fieldwork by the author in the central Mississippi Delta have yielded observations about persistent poverty and the dominance of large farms on the landscape. Questioning farmers and community members highlighted the role of government subsidies that kept these farmers in business and enabled them to expand their agricultural operations. However, also spending years living, working, and conducting interviews in other counties of this region illuminated the diverse landscape, as large farms and poverty are not clearly observable throughout the entire Delta region. Observations raised the question of the relationship between large-scale farming, subsidies, and poverty. Research spawned by the Goldschmidt hypothesis and related studies demonstrate the likelihood of this relationship, although there are questions about the relationship’s strength for all geographies and temporal frameworks. In addition, some scholars and this dissertation have produced interviews and research that suggest government subsidies play a strong role in perpetuating and expanding large-scale farms. This research offers a geographic hypothesis that three key sets of variables, large-scale agristucture, high farm subsidy income, and low socio-economic standing, possess a positive spatial correlation to each other. This is a vital investigation in its own right because policymakers misconceive the region as a uniform place with uniform economic development needs and neglect to account for agriculture as a part of its development problems. This study shows that the Delta has several sub-regions, each with different problems and potential, and that the role of agriculture in these issues varies with
physical geography, economic diversity, and community involvement in each area. The results of this research may be classified into several categories: univariate LISA tests, composite map compilation, correlation analysis, and interviews.

**Univariate LISA.** Cluster analysis through the Local Indicator of Spatial Autocorrelation (LISA) provides the means to generate a cluster map for each of the individual variables for each year of data collection within the study period. The maps depict areas where significantly high and low values exist across neighboring counties. For example, significantly high values for the percent non-white population in each county calculated for each census year from 1980-2000 reveals a temporally and spatially stable cluster area (Figure 4.1). Analysis of each variable for each of its associated collection years yields 72 maps (Appendices A, B, C). These are useful as individual tools for understanding where each variable tends to cluster and whether or not temporal stability exists for these areas. Overall, spatial and temporal stability is evident for the measured characteristics. In addition to the cluster maps, Geoda provides a map for each variable’s cluster significance using a $p$ value describing how different the observed pattern is from a random distribution. A randomization process generates this value where the observed values are compared to the expected values. The result indicates the significance of the values as a cluster rather than a random distribution. The significance value produced by GeoDa is helpful in knowing how much faith to put in the results of the analysis. For all calculations in this study, $p$ values ranged from $p=0.05$ to $p=0.01$, meaning that the results can be accepted with between 95% and 99% confidence. Results at this level are significant and reliable. Finally, Geoda produces a Moran’s Scatterplot (Appendices A, B, C). This output displays the distribution of values with their spatial weights. The number generated from the spatial distribution ranges from zero to one. As values
approach one, they are more strongly clustered. For this investigation, Moran’s I values of 0.5 and greater are considered to have strong positive clustering characteristics.

![Figure 4.1 Lisa output for the variable “percent non-white”](image)

Using the univariate analysis tool within Geoda is essential for understanding the relationship each variable has with itself. It answers the questions: is the pattern a cluster or random, and if it is a cluster, how strong is the relationship? It also enables a comparison of each variable over time to provide visualization of the observed pattern’s consistency. Results from this analysis are clear. For most variables, a strong cluster pattern exists, and the central Delta is the location where negative socio-economic indicators, large-scale agricultural operations, and high subsidy income coincide (Appendices A, B, C). The next step is to compile the individual variables in each data set – agristructure, socio-economic, and subsidy – into composite maps see how the three generalized characteristics relate (Figures 4.2 and 4.3).

**Composite map compilation.** From these individual maps (Appendices A, B, C) composite maps are derived through the creation of a cluster index. Again, using the example of percent non-white, each county with a significantly high score in relation to
its neighbors (the hot spot counties) receives a 1 in the index. Counties with significantly low values receive a −1; non-significant values for counties equal a 0 in the index, while the positive and negative outliers are given .5 and -.5 respectively. The result is a composite map for each of the three subjects under investigation. These maps can then be correlated with one another to assess the spatial relationships within the region.

The value of using LISA and correlation is their objectivity and the calculation of a numerical measurement for the relationships; however, a subjective matter arises in determining how to create the composite map. The first question is at what point is temporal stability achieved for any variable in each county? For example, if the poverty rate of a county is significantly high for one year, is this value due to a fleeting event or is it part of a consistent pattern? What is the minimum requirement needed to say high levels of poverty characterize the place? Expanding this example from poverty to low socio-economic variables, the broader question, and the subjective concern, is how often must significant salient variables be present in order to say a county has a consistently low socio-economic standing and should be included in the composite map of these characteristics. This subjective decision is necessary to create the index yielding each of the three composite maps: areas of high subsidy income, areas of large-scale agristucture, and areas with poor community well-being indicators.

Due to the initial concern with conducting the analysis with the tightest constraints for neighborhood definition, hence utilizing a Rook 1 neighborhood configuration for the LISA (measuring county values in relation to first order neighbors with a shared boundary), the most sensible choice is to take only the highest value whereby these counties scored significantly high for every variable in every measured year. However, this delineation includes too few counties for a correlation analysis
Therefore, the method used to select the counties presenting the most consistent problematic characteristics requires that a county must score a minimum of one significant value per year for each variable. This same method applies to the farm subsidy, community well-being, and agristucture composite maps. All three maps employ the same classification standard and contain enough counties for correlation analysis. This index system creates an individual composite cluster for the three categories to be correlated: agristucture, community well-being (socio-economic variables), and government subsidies (Figure 4.3).

From the maps in Figures 4.2 and 4.3, the pattern of significant subsidy income is relatively similar despite different methods of inclusion in the composite map, yet the patterns for agristucture and socioeconomic variables change considerably. This discrepancy is due to one factor, the number of variables used to create the composite map. For subsidy payments, only one variable captures these data, yet for agristucture and socio-economic indicators many variables come together to form the composite (refer to Tables 3.1 and 3.2). Due to this difference, whether only the highest values are considered or if a minimum of one significant value per year per variable is counted for
themselves, yet one that is labor extensive. These farmers tend to live away from their land and use it as in investment rather than for active production. This situation was noted as having some relationship with depopulation in the area over the past twenty years. Poor employment opportunities have been concurrent with this transition and seem to account for some of the low socio-economic variables.

**Only Large-scale Agriculture.** Though these counties have significant large-scale agriculture, they do not share high values for subsidy income or poor community well-being (Figure 4.9). Informants provided several explanations for this situation.
Again, the core of the Delta region is not represented in this category. These areas are peripheral and physical properties of the land may be influential. For some counties, as much as half or more of the land is out of the river bottom soil. Farmers grow crops other than the heavily subsidized cotton or soybeans, yet still on large acreages. Also, flood hazards prompt many growers to produce soybeans in the river bottom, which is still a large production activity but with less subsidization than cotton. For others, sugar cane is the sole crop. It requires large-scale operations, yet is not supported by subsidies but by trade tariffs. Cane production also coincides with economic diversity through petroleum or paper processing in southern Louisiana. Again, experts noted that farmers in the area are local residents and are involved in the community; diverse economies also coincide with these other characteristics.
General Comments. Informants identified community colleges as an asset to a rural community by providing workforce training in counties seeking to expand employment opportunities. Hiring industries, however, are not necessarily in the county, but within driving distance. The specific job training, in concert with industrial employment, lessens the impact of the decreasing labor need in agriculture.

An economic development expert noted that a workforce needs to be available, trainable, and stable. However, a general sentiment was expressed regarding the stability of the African American labor pool versus the Hispanic. In counties with cotton gins and vegetable farming, Hispanic seasonal migrant labor is employed in jobs that used to be held by the resident African American population. Also, in counties dominated by row crop agriculture small but growing resident Hispanic communities are developing, thus providing what was described as a more stable, reliable workforce for agriculture and related jobs in these areas. This trend may be partially responsible for the high unemployment rates among African Americans. In general, informants labeled the Hispanic workforce as preferable to the local African American workers.

Interviewees also identified infrastructure as an essential component to the well-being of a community through the opportunities it provides to the population. Overall, areas near ports on the Mississippi River, or with planned ports, draw more interest from industry, as do areas proximate to major interstate highways. Experts also believe that having government employment and universities in or near their counties helps stabilize employment and create a skilled workforce. One contradictory finding was that most people said that dry counties, those in which alcohol can not be sold, had problems with community well-being because they have difficulty attracting restaurants and potential
residents. However, a dissenting belief exists that the dry counties actually have better communities because alcohol is more difficult to purchase. The most consistent explanation provided for the lack of employment opportunity, outside of agriculture, is that potential employers have a negative perception of the region. Lack of quality education and amenities for management make it a difficult place to entice economic development. Another factor that hinders employment opportunities and deals directly with agriculture is the reluctance of large landowners to sell land for activities other than farming; a general lack of pro-business mentality on the part of the farming community. By some accounts though, this mentality may be changing in the most desolate parts of the Delta where community leaders are starting to see the error of their ways.

Two areas of the Delta that do not present the significant socio-economic problems of the central Delta are south Louisiana and eastern Arkansas. From discussions with local experts and residents, the two areas share a similarity in the existence of an alternate major industry. For south Louisiana, although sugar cane production is a dominant land use and employer in the rural parishes, the petroleum industry provides an additional opportunity for income, indeed income that is higher and more stable than what could be expected by this population from agricultural employment. Likewise, eastern Arkansas has a steel-manufacturing hub. Not only do plants like Nucor provide full-time work with generous wages, but satellite industries have developed in the area. With the many options provided by this sector, the proximate population benefits by reducing dependence on the traditional agricultural employment.

In conclusion, several patterns exist within the Delta. First, the central or core counties of this region demonstrate a confluence of large-scale agriculture, high farm subsidy payments, and poor community well-being. Subsidies have a role in the area’s
woes. However, this variable does not act alone, but in concert with global market forces. In addition, a near monoculture production pattern exists with most farm land in cotton and soybeans, lessening land use diversity and perpetuating economic dependence. The area has difficulty attracting new employers due to the established monopoly of row crop farming and the uneducated work force and substandard infrastructure that is the result of this land use. The counties in this area comprise the idea of the Delta as a plantation remnant. However, this core is not representative of the entire region.

Other areas within the Delta are stable or thriving economically. These counties tend to possess multiple major employers or are near counties that have this characteristic. Also, for those places heavily vested in agriculture, the land use does not tend to be cotton and soybeans alone, but is diverse. In these places farmers live in the area and are an active component in the well-being of their community. Therefore, the hypothesized relationship between subsidies, farming operations, and socio-economic variables does exist, though with the qualification that geography makes a difference in where this pattern is found. To say that the Delta is a homogeneous region facing problems from a bygone plantation era is too general to be helpful in improving its status today and in providing viable options for its future. For groups, such as the Delta Regional Authority, charged with improving the well-being of the region, progress will not be truly achieved unless the diversity of the region and the current role of agriculture is taken into account with its possibilities and limitations for the Delta.
CHAPTER 5: CONCLUSIONS AND DISCUSSION

Conclusions

This dissertation’s aim was to identify and analyze the spatial patterns of large-scale agriculture, farm subsidy income, and poor socio-economic characteristics in the Mississippi Delta. Its purpose was to understand the role of agriculture and subsidies on rural counties in the region. The hypothesis asserts that areas with large-scale agriculture will also be areas of high farm subsidy income and low socio-economic standing; in effect a landscape of subsidization will become evident. Several salient conclusions result from this research, some which may be directed toward policy improvement and others toward academic pursuits. These conclusions are summarized by the following categories: the relationships among subsidies, agristructure, and community well-being in the region; the diversity of the Delta and its future role in defining the region; the future of farming, subsidies, and rural communities in the Delta.

Subsidies, Agristructure, and Community Well-being. Previous research has investigated the relationship between agriculture and rural communities, and between subsidies and agriculture. This study is the first to treat these two subjects as interrelated rather than disparate. Integrating data from previous investigations, through GIS, highlights a similar spatial pattern among the data sets (Appendices A, B, and C). Interviews enhance the statistical results by suggesting reasons for the spatial patterns and providing insight into their causality, the variables and local conditions that yield a distressed rural community and those related to prosperity.

The hypothesized relationship exists, but not for the entire region. The landscape of subsidization is centered in the core of the area, the Mississippi River bottom, while
the periphery lacks these characteristics. Local economic diversity, land use diversity, and community involvement on the part of farmers are the keys to overcoming negative outcomes from large-scale agriculture. Diversity allows the population some protection from the vacillating movements of the global market. Farmer involvement in the community invests this person with the locality, integrating him in the local market.

**Defining the Region.** The Delta is an amorphous region. Its territory varies depending on who’s defining it and for what purpose. Unfortunately, past and present government agencies charged with supporting the region, the Lower Mississippi Delta Development Commission (LMDDC) and the Delta Regional Authority (DRA), respectively, have approached it as a spatially homogeneous area with uniform problems. Recognizing the diversity that exists is a first step in understanding that a one-size-fits-all approach to economic development and community improvement is not effective. For example, though high poverty rates exist in several parts of the Delta, the same processes are not necessarily behind a similar result and therefore alleviation of poverty should not be addressed the same way in all places (Figures B-64 – B-72). The Delta does have plantation remnants in large-scale agriculture, but it also has pine forests, urban areas, hills, coastline, casinos, small farmers, petroleum industry, and suburban sprawl.

**The Future of Farms, Farm Payments, and Rural Communities.** Many farmers hung their heads and lowered their voices when they discussed the future of farming in the Delta. The land is well-suited to large-scale row crop agriculture, but without subsidization from the federal government, this type of land use will not be able to survive with family farmers at the helm. The costs of production increase every year, yet commodity prices are uncertain. Due to pressure from the World Trade Organization, U.S. crop subsidies are facing a certain decline and potential death in the near future. With this ominous
change ahead, many farmers and agricultural experts in the Delta believe that farming has nowhere to go but toward corporate structure. At the present time, the region’s corporate farms are centered along the Mississippi River where large tracts of land and alluvium persist. However, as farmers are aging and younger generations are not seeking to continue family operations, corporate ventures are likely to inherit many of the farms that exist today. Remove government support from this equation and the situation becomes bleaker still for the survival of independent farmers.

Although the current environment of large farms and high subsidies is not necessarily an optimal situation for rural residents of the region, changing to a more corporate agristucture or retiring land from agriculture altogether has another set of implications for the Delta. The small businesses that exist today are tied to the agricultural economy, either as a satellite industry or as companies depend on farmers to buy their cars, groceries, clothes, and other goods and services. Without income from the farmers and the few laborers they hire, many of these establishments would suffer and eventually go out of business. This situation does not offer hopeful alternatives. It is no wonder that farmers in the area are unable to imagine a positive future.

Discussion

It is fair to say that although the research agenda for this investigation was achieved, more questions have been raised than have been answered. The questions arise in several specific areas, namely methodological critiques on the Goldschmidt hypothesis literature, salient variables for inclusion in future research on this topic, alternative classification schemes for correlation analysis of these characteristics, scale impacts on this investigation, and the use of GIS and spatial analysis by those not formally trained in geography.
Goldschmidt Hypothesis. The research of Goldschmidt is certainly valid, as it has been confirmed to varying degrees in numerous works on the subject. Yet, current work in this area neglects the spatial variation of the relationships between agristructure and community well-being and has overlooked the role of the region and regional crop culture. The use of advanced spatial analysis, the role of the dominant crop, and the influence of regional location are all issues that should raise more questions in this line of research.

Although GIS has been used to map agricultural variables in relation to Goldschmidt, it is elementary at best and is devoid of analysis. This comment is not meant to be negative, for mapping is a useful tool for visual analysis of phenomena. However, with advanced spatial analysis techniques, mapping need not be the final word in geographic investigation. With this understanding, exploratory and confirmatory research needs to be conducted so that the literature in this area progresses from geographic description and observation to testing the hypotheses proposed in these existing works. What knowledge about the subject might a Geographically Weighted Regression (GWR) add? How could data from existing works be revisited with the assistance of correlation and regression techniques? What pattern would emerge if the work on factor analysis would include its geographic counterpart of mapping the factor scores, rather than just presenting output in tabular format?

The current body of work on the Goldschmidt hypothesis also lacks accounting for the crops of regional dominance, as many of the studies have been national in scale yet do not account for the crop’s role in regional variation. Consulting the work of Earle (1998) and of Daniel (1988) could fill this gap. Earle has noted the pervasive role of crop dominance in accounting for regional variation in social and economic issues such as
slavery, while Daniel proposes the idea of a crop culture. He notes that community life has been known to exist around the production of a crop, hence the crop culture. How do the agristucture variables employed in this dissertation vary with regional crop dominance? What relationship does the crop have to community well-being? How do government subsidies targeted at particular crops (i.e. peanuts or cotton) impact the communities?

Salient Variables. The variables selected for identification of county agristucture and community well-being are derived from factor analyses by rural sociologists such as Lobao, Thomas, and Wimberley. Prior to their work, the characteristics of farm scale, ownership, operator, operator characteristics, and labor resources, among others, had been described by only one variable. For example, the scale of farming in a county would have been described by the average farm size. However, with the current works this same variable is characterized by average farm size, along with the number of farms, the percentage of land in the county in farms, the number of small farms, gross sales, and average farm real estate value (Appendix A). On the socioeconomic side, a similar advancement was made (Appendix B). In particular, many variables helped define areas of poverty, not merely the percent of the population below the poverty line. This work is an improvement upon its predecessors, yet even more robust measures may exist when taking into account characteristics of the county business patterns, predominant employment, health indicators, and county tax revenue. The question arises of what other variables prove salient as indicators of community well-being and agristucture? This can be answered by a more holistic factor analysis.

Furthermore, several of the variables seem to create redundancies in measurement. The percentage of families below poverty and the average per capita
expenditure for food stamps are examples. The next logical step in this study is to examine causality through multiple regression analysis, specifically using Geographically Weighted Regression (GWR). One benefit of this approach is the generation of statistics on multi-collinearity, more simply stated the degree to which variables measure the same phenomena. The GWR outcome is certainly powerful in its own right, but the multi-collinearity statistics are an added bonus that would not only improve the model of spatial relationships, but also inform the existing literature on salient agristucture and community well-being measures.

**Alternative Classification Schemes.** Local Indicators of Spatial Autocorrelation (LISA) provide an added bonus of not just identifying clusters from area data, but by showing statistical significance (Figures A-2, A-4, A-8). This aspect of the tool is efficient for the creation of a multivariate index. It provides a clear delineation for classification of values that are significant and those that are not. However, the use of these indexes for correlation leaves room for subjectivity. For instance, in creating each of the composite maps it was necessary to determine if the final risk areas for agristucture, community well-being, and subsidy income used for correlation would be comprised of counties that scored significantly for all variables in all years; would it include only those that scored significantly high for all variables in two out of three years; or would some other classification scheme also make sense? When analyzing smaller datasets of similar sizes the answers may be easier to see, but in this case with a large agristucture dataset, a relatively smaller community well-being dataset, and a univariate subsidy file, no accepted classification scheme exists, except what seems to makes sense to the researcher. Therefore, it was determined that a minimum value for inclusion in the composite maps should be a score that is equal to or greater than the value generated if
significance was made for at least one year for each variable. With this classification scheme the possible error is over-inclusion rather than leaving out a distressed county. From here the classification scheme can tighten in future work to more narrowly define spatial locations of specific risks rather than those that form the composite risk area. For this research, though, this delineation makes sense. Questions arise, though, in how might the results vary given a more inclusive or more exclusive classification scheme? Due to the consistently strong correlation presented in this study and the visible core-periphery pattern the hypothesis is that variation will be slight. Yet, south Louisiana scored significantly high on many variables, though not enough to include it in all of the final composite maps. This is a region where more inclusive classification might identify another cluster. **Scale Impacts.** One limitation of many of the studies stemming from the Goldschmidt hypothesis, this study included, is that a scale limitation exists. If the variables identified as salient in understanding the agristructure-community relationship are accepted, then most studies will have to rely on the U.S. Census and the U.S. Department of Agriculture for data collection. However, county level data are inherently general. Of course, the numbers do provide insight when comparison is at a national or regional scale, thus this is the appropriate scale for analysis of the Delta region. Nonetheless, these data are smoothed. For example, in the LISA maps and the composite maps whole counties and groups of counties are identified as facing problems with unemployment. However, in reality it is doubtful that every square mile of these places has this problem. Rapides Parish, Louisiana, provides support for this assertion (Figure 5.1). Even when unemployment is observed at a finer scale than the county, in this case at the census tract scale, the generalization of the data is clear. One tract in the southeast corner of the
parish repeatedly reports a high unemployment rate. A closer look at this census tract exemplifies a more realistic occurrence; that one small community exists in the tract and that its unemployment rate is applied to the much larger area of its associated census tract. The mapping of unemployment in Rapides Parish raises the question of scale. What impact does a variation in scale of analysis have on the results of this research?

**Use of GIS by Non-geographers.** The comments and questions raised in the previous sections of this chapter come from spending time with the data and having had extensive formal training in geography and GIS. This background provides an appreciation for the abilities and limitations of data and techniques of spatial analysis. As GIS has become easily attainable through Windows-based software, many users have limited knowledge of geography and spatial statistics. Certainly geographers cannot claim to be the sole owner of GIS technology, for its power as a tool for visualization and analysis is rapidly spreading to even the most remote corners of academia, government, and the private sector. However, geographers can rightly claim to be the sole philosophers and practitioners of the concepts and techniques that provide GIS with its power. A common statement by GIS-oriented geographers is that just because someone is taught how to use a word processing package does not mean that this person knows how to write, type maybe, but not necessarily to produce a work of value. The same is true of GIS. With its diffusion beyond the realm of geography many people have access to it and apply its technology to their work. However, without understanding concepts such as normalization, themodifiable area unit problem, and issues of scale, the output from their work is likely to be misleading, cartographically and statistically wrong. Even if the output is valid, one wonders how thoroughly it can be interpreted and understood.
The works of such rural sociologists, notably Lobao, laudably draw on the works of geographers such as Massey and Kodras and have been the major contributor to work on the Goldschmidt hypothesis and its various strains. Without this literature, the present geographical research could not have been undertaken. Rural Sociology is credited fully for this extensive literature. However, as GIS has been employed in a few instances, little expertise has been drawn from the geographic/GIS literature on the methods, concepts, and cautions of its use. Most surprisingly, GIS is mentioned as a new method for analysis. It is indeed new to many disciplines, but not to geography. This assertion of its youth in research only illuminates the lack of knowledge of existing literature beyond
one’s home discipline. It certainly applies to this research in that Goldschmidt had no bearing on the inception of the questions driving this research, but only entered into it through extra-disciplinary literature review.

**Conclusion.** Areas of large-scale agristucture, poor socioeconomic levels, and high farm subsidy income in the Delta have similar geographies; they create a landscape of subsidization wherein both the wealthy and the poor are supported by the federal government. Quantitative and qualitative support of strong positive correlation paves the way for more rigorous research into the causal relationships between these variables. Beyond providing a robust research agenda for years to come, this work illuminates the diversity of the region and proposes that it should not be so casually classified as a homogeneous place for economic development policy, as has been done by creation of the LMDDC and DRA. Most notably, it identifies an unknown spatial phenomenon in the Delta, one that identifies a close relationship between crops, farm operation, subsidy income, and the prosperity of a place. Recognition of these results will hopefully influence policy in that an understanding will prevail that farm subsidies are likely to harm our local populations, given a lack of economic diversity. The negative impacts of this farm subsidization are not relegated to the developing world, but may in fact be promoting wealth for our farmers while perpetuating deprivation for people living near those farms.


Figure A-1

Average Government Payment Per County 1987

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure A-3

Average Government Payment Per County 1987

Moran’s Scatterplot

Moran’s I = 0.6708

GP87TRY

W_GP87TRY
Figure A-4  
Average Government Payment Per County 1992

Cluster Map

~ 75 miles
Figure B-4

Percent Non-white 1990

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-5

Percent Non-white 1990

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure B-6  Percent Non-white 1990

Moran’s Scatteplot

Moran’s I= 0.7543

W. PNW90

PNW90
Figure B-7

Percent Non-white 2000

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-8

Percent Non-white 2000

Significance Map

- P = 0.05
- P = 0.01

~ 75 miles
Figure B-9

Percent Non-white 2000

Moran’s Scatteplot

Moran's I = 0.7348

PNW00

W_PNW00
Figure B-10

Percent Unemployment 1980

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure B-11

Percent Unemployment 1980

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure B-12
Percent Unemployment 1980

Moran’s Scatterplot

Moran’s $I = 0.3469$
Figure B-13

Percent Unemployment 1990

Cluster Map

~ 75 miles

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value
Figure B-14  
Percent Unemployment 1990

Significance Map

- P = 0.05
- P = 0.01

~ 75 miles
Figure B-15

Percent Unemployment 1990

Moran’s Scatteplot

Moran’s I= 0.2901
Figure B-16

Percent Unemployment 2000

Cluster Map

~ 75miles

Legend:
- Red: High value next to high value
- Blue: Low value next to low value
- Pink: High value next to low value
- Light blue: Low value next to high value
Figure B-17

Percent Unemployment 2000

Significance Map

P = 0.05

P = 0.01

~ 75 miles
Figure B-18

Percent Unemployment 2000

Moran’s Scatterplot

Moran's I = 0.3341
Figure B-19
Percent High School Graduates 1980

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure B-20

Percent High School Graduates 1980

Significance Map

~ 75miles

P = 0.05

P = 0.01
Figure B-21

Percent High School Graduates 1980

Moran’s Scatteplot

![Scatterplot showing Moran’s I = 0.3178](scatterplot_image.png)
Figure B-22

Percent High School Graduates 1990

Cluster Map

~ 75 miles
Figure B-23

Percent High School Graduates 1990

Significance Map

P = 0.05

P = 0.01

~ 75 miles
Figure B-24

Percent High School Graduates 1990

Moran’s Scatterplot

Moran’s I = 0.3862
Figure B-25

Percent High School Graduates 2000

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-26

Percent High School Graduates 2000

Significance Map

~ 75 miles

P = 0.05

P = 0.01

164
Moran’s Scatterplot

Moran's I = 0.3978
Figure B-29

Food Stamp Payments Per Capita 1980

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Moran’s Scatterplot

Moran’s I = 0.6320
Figure B-32

Food Stamp Payments Per Capita 1990

Significance Map

~ 75miles

<table>
<thead>
<tr>
<th>Color</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
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</tr>
<tr>
<td>Dark Green</td>
<td>P = 0.01</td>
</tr>
</tbody>
</table>
Figure B-33

Food Stamp Payments Per Capita 1990

Moran’s Scatterplot

Moran’s I = 0.5935
Food Stamp Payments Per Capita 2000

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure B-35

Food Stamp Payments Per Capita 2000

Significance Map

- P = 0.05
- P = 0.01

~ 75 miles
Moran’s Scatteplot

Moran's I = 0.4322
Figure B-37

Percent Urbanized 1980

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-39

Percent Urbanized 1980

Moran’s Scatterplot

Moran’s I = 0.1822
Figure B-40
Percent Urbanized 1990

Cluster Map

~ 75 miles

Legend:
- Red: High value next to high value
- Blue: Low value next to low value
- Light blue: High value next to low value
- Pink: Low value next to high value
Figure B-41

Percent Urbanized 1990

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Moran's Scatterplot

Percent Urbanized 1990

Moran's I = 0.2007
Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure B-45

Percent Urbanized 2000

Moran’s Scatteplot

Moran’s I = 0.2473
Figure B-47  Percent Rural Farm Population from Total Rural Population 1980

Significance Map

- P = 0.05
- P = 0.01

~ 75 miles
Figure B-48  Percent Rural Farm Population from Total Rural Population 1980

Moran’s Scatteplot

Moran’s I = 0.5476
Figure B-49  Percent Rural Farm Population from Total Rural Population 1990

Cluster Map

<table>
<thead>
<tr>
<th>Scale</th>
<th>Legend Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ 75miles</td>
<td>High value next to high value</td>
</tr>
<tr>
<td></td>
<td>Low value next to low value</td>
</tr>
<tr>
<td></td>
<td>High value next to low value</td>
</tr>
<tr>
<td></td>
<td>Low value next to high value</td>
</tr>
</tbody>
</table>
Figure B-50
Percent Rural Farm Population from Total Rural Population 1990

Significance Map

~ 75 miles
Figure B-51

Percent Rural Farm Population from Total Rural Population 1990

Moran’s Scatteplot

Moran’s I = 0.4903
Figure B-52

Percent Rural Farm Population from Total Rural Population 2000

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-53  Percent Rural Farm Population from Total Rural Population 2000

Significance Map

P = 0.05

P = 0.01

~ 75 miles
Moran’s Scatteplot

Moran's I = 0.4926
Figure B-56

Median Family Income 1980

Significance Map

- ~ 75 miles
- P = 0.05
- P = 0.01
Figure B-57

Median Family Income 1980

Moran’s Scatteplot

Moran’s I = 0.5223
Figure B-58

Median Family Income 1990

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure B-59

Median Family Income 1990

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure B-60

Median Family Income 1990

Moran’s Scatterplot

Moran’s I = 0.4751

MEDIN90
Median Family Income 2000

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-62  
Median Family Income 2000  
Significance Map  

~ 75 miles  

Legend:  
- Green: P = 0.05  
- Darker Green: P = 0.01
Figure B-62

Median Family Income 2000

Moran’s Scatteplot

Moran's I = 0.4346
Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75miles
Figure B-65  
Percentage of Families in Poverty 1980

Significance Map

![Map showing significance of poverty levels in 1980 with color coding for P=0.05 and P=0.01. The map includes a scale indicating approximately 75 miles.]

~ 75 miles

Legend:
- Green: P = 0.05
- Dark Green: P = 0.01
Figure B-66  Percentage of Families in Poverty 1980

Moran’s Scatterplot

Moran’s I = -0.0122
Figure B-67

Percentage of Families in Poverty 1990

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure B-68  Percentage of Families in Poverty 1990

Significance Map

~ 75miles

- Green: $P = 0.05$
- Dark Green: $P = 0.01$
Figure B-69  Percentage of Families in Poverty 1990

Moran’s Scatterplot

Moran's I = 0.5906
Figure B-70

Percentage of Families in Poverty 2000

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-71

Percentage of Families in Poverty 2000

Significance Map

[Map showing percentage of families in poverty with significance levels P=0.05 and P=0.01 marked in green and darker green, respectively. The map is labeled with a distance indicator of ~75 miles.]
Figure B-72  Percentage of Families in Poverty 2000

Moran’s Scatterplot

Moran’s I = 0.5103
Figure B-73

Average Wage per County 1980

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure B-74

Average Wage per County 1980

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure B-75

Average Wage per County 1980

Moran’s Scatterplot

Moran’s I = 0.3894

WAGES80

WAGES80
Figure B-76

Average Wage per County 1990

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-77

Average Wage per County 1990

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure B-79

Average Wage per County 2000

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure B-80

Average Wage per County 2000

Significance Map

~75 miles

P = 0.05

P = 0.01
Figure B-81

Average Wage per County 2000

Moran’s Scatteplot

Moran's I = 0.2748
APPENDIX C – AGRISTRUCTURE VARIABLES

GEODA ANALYSIS
Figure C-1

Number of Farms 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-2

Number of Farms 1987

Significance Map

~ 75 miles

<table>
<thead>
<tr>
<th>Color</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>P = 0.05</td>
</tr>
<tr>
<td>Gray</td>
<td>P = 0.01</td>
</tr>
</tbody>
</table>
Figure C-3

Number of Farms 1987

Moran's I = 0.5853
Figure C-4

Number of Farms 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-5

Number of Farms 1992

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-6  Number of Farms 1992

Moran's I = 0.5860
Figure C-7

Number of Farms 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure C-8

Number of Farms 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-9  Number of Farms 1997

Moran's I = 0.6159
Figure C-10

Land in Farms 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-11

Land in Farms 1987

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-13

Land in Farms 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-14

Land in Farms 1992

Significance Map

- Green: $P = 0.05$
- Dark Green: $P = 0.01$

~ 75 miles
Figure C-17

Land in Farms 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-18

Land in Farms 1997

Moran's I = 0.6848
Figure C-19
Mean Farm Size 1987

Cluster Map

~ 75 miles

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value
Figure C-21
Mean Farm Size 1987

Moran's I = 0.6110
Figure C-22

Mean Farm Size 1992

Cluster Map

~ 75 miles

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value
Figure C-23

Mean Farm Size 1992

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-24
Mean Farm Size 1992
Figure C-25  
Mean Farm Size 1997  
Cluster Map

~ 75miles

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

245
Figure C-26

Mean Farm Size 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-27
Mean Farm Size 1997

Moran's I = 0.6505
Figure C-28

Number of Small Farms 1987

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75miles
Figure C-29  
Number of Small Farms 1987

Significance Map

~ 75 miles

- Green: $P = 0.05$
- Dark Green: $P = 0.01$
Moran's I = 0.5636
Figure C-31

Number of Small Farms 1992

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure C-32

Number of Small Farms 1992

Significance Map

~ 75 miles

<table>
<thead>
<tr>
<th>Color</th>
<th>Significance Level</th>
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<td>Green</td>
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</tr>
<tr>
<td>Dark Green</td>
<td>P = 0.01</td>
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</table>

252
Figure C-33

Number of Small Farms 1992

Moran's I = 0.5975
Figure C-34
Number of Small Farms 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-35

Number of Small Farms 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-36
Number of Small Farms 1997

Moran's I = 0.5447

$W_{\text{DAD\_NORM}}$ vs $\text{DAD\_NORM}$
Figure C-37

Gross Sales 1987

Cluster Map

~ 75 miles

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value
Figure C-38

Gross Sales 1987

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-40

Gross Sales 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-43  
Gross Sales 1997  
Cluster Map

~ 75 miles

- **High value next to high value**
- **Low value next to low value**
- **High value next to low value**
- **Low value next to high value**
Figure C-44

Gross Sales 1997

Significance Map

~ 75miles

P = 0.05

P = 0.01
Figure C-46

Average Farm Real Estate Value 1987

Cluster Map

~ 75 miles

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value
Figure C-47

Average Farm Real Estate Value 1987

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-48

Average Farm Real Estate Value 1987

Moran's $I = 0.5703$
Figure C-49
Average Farm Real Estate Value 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-50

Average Farm Real Estate Value 1992

Significance Map

~ 75 miles

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</tr>
<tr>
<td>Dark Green</td>
<td>P = 0.01</td>
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</table>
Figure C-51

Average Farm Real Estate Value 1992

Moran's I = 0.5659

DAF92 vs. W_DAF92 Scatterplot
Figure C-52

Average Farm Real Estate Value 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure C-54

Average Farm Real Estate Value 1997

Moran's I = 0.6043
Figure C-55

Number of Individual Family Owners 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-56

Number of Individual Family Owners 1987

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Number of Individual Family Owners 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-60
Number of Individual Family Owners 1992

Moran's I = 0.6012

W - DAG92NORM

DAG92NORM
Figure C-61
Number of Individual Family Owners 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure C-62

Number of Individual Family Owners 1997

Significance Map

~ 75miles

P= 0.05

P= 0.01
Figure C-63

Number of Individual Family Owners 1997

Moran's I = 0.6430
Figure C-64

Number of Corporate Owners 1987

Cluster Map

~ 75 miles
Figure C-65
Number of Corporate Owners 1987

Significance Map

~ 75miles

P = 0.05
P = 0.01
Figure C-66
Number of Corporate Owners 1987

Moran's I = 0.5217
Figure C-67

Number of Corporate Owners 1992

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure C-68
Number of Corporate Owners 1992

Significance Map

~ 75miles

- P = 0.05
- P = 0.01
Figure C-69  
Number of Corporate Owners 1992

Moran's I = 0.5851

![Scatter plot showing the relationship between W and DAI92NORM with Moran's I = 0.5851.](image)
Figure C-70

Number of Corporate Owners 1997

Cluster Map

~ 75 miles
Figure C-72

Number of Corporate Owners 1997

Moran's I = 0.5523
Figure C-73

Number of Full Owners 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles

293
Figure C-74

Number of Full Owners 1987

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-75

Number of Full Owners 1987

Moran's I = 0.6875
Figure C-76
Number of Full Owners 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-77

Number of Full Owners 1992

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-78

Number of Full Owners 1992

Moran's I = 0.6865
Figure C-79  
Number of Full Owners 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-80

Number of Full Owners 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-81  Number of Full Owners 1997

Moran's I = 0.6750
Figure C-82

Number of Tenants 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure C-83

Number of Tenants 1987

Significance Map

- P = 0.05
- P = 0.01

~ 75 miles
Figure C-84

Number of Tenants 1987

Moran's I = 0.6753
Figure C-85

Number of Tenants 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-86
Number of Tenants 1992

Significance Map

P = 0.05
P = 0.01

~ 75 miles
Figure C-87

Number of Tenants 1992

Moran's I = 0.6736
Figure C-88

Number of Tenants 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure C-90

Number of Tenants 1997

Moran's I = 0.6453
Figure C-91
Number of Farmers Working 200+ Days Off-Farm 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-92  
Number of Farmers Working 200+ Days Off-Farm  1987

Significance Map

~ 75miles
Figure C-93  
Number of Farmers Working 200+ Days Off-Farm 1987

Moran’s I = 0.6132

W_DAM87NORM

DAM87NORM

313
Figure C-94
Number of Farmers Working 200+ Days Off-Farm 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles
Figure C-95

Number of Farmers Working 200+ Days Off-Farm 1992

Significance Map

- Green: P = 0.05
- Dark Green: P = 0.01

~ 75 miles
Figure C-96  Number of Farmers Working 200+ Days Off-Farm  1992

Moran's I = 0.5815

W DAM92NORM

DAM92NORM

316
Figure C-97  Number of Farmers Working 200+ Days Off-Farm  1997

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure C-98  
Number of Farmers Working 200+ Days Off-Farm 1997

Significance Map

- P = 0.05
- P = 0.01

~ 75 miles
Figure C-99

Number of Farmers Working 200+ Days Off-Farm 1997

Moran's I = 0.6080
Figure C-100  
Number of Farmers who are Residents 1987

Cluster Map

~ 75 miles

- Red: High value next to high value
- Blue: Low value next to low value
- Pink: High value next to low value
- Light blue: Low value next to high value
Figure C-101

Number of Farmers who are Residents  1987

Significance Map

- P = 0.05
- P = 0.01

~ 75miles
Figure C-102

Number of Farmers who are Residents 1987

Moran's I = 0.6679
Figure C-103

Number of Farmers who are Residents 1992

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-104

Number of Farmers who are Residents 1992

Significance Map

P = 0.05
P = 0.01

~ 75 miles
Figure C-105

Number of Farmers who are Residents 1992
Figure C-106  
Number of Farmers who are Residents  1997

Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure C-107  
Number of Farmers who are Residents 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01

327
Figure C-108
Number of Farmers who are Residents 1997

Moran's I = 0.6420
Figure C-109
Number of Farms with Hired Workers 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Figure C-110

Number of Farms with Hired Workers 1987

Significance Map

~ 75 miles

- P = 0.05
- P = 0.01
Figure C-111

Number of Farms with Hired Workers 1987

Moran’s I = 0.5263
Figure C-114
Number of Farms with Hired Workers 1992
Figure C-115  
Number of Farms with Hired Workers 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Number of Farms with Hired Workers  1997

Significance Map

~ 75miles
Figure C-117

Number of Farms with Hired Workers 1997

Moran's I = 0.5330
Figure C-118  
Number of Farms Hired Workers 1992

Cluster Map

~ 75miles

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value
Figure C-119

Number of Farms Hired Workers 1992

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-120  Number of Farms Hired Workers  1992

Moran's I = 0.5132
Figure C-122

Number of Farms Hired Workers 1997

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-123  Number of Farms Hired Workers  1997

Moran's I = 0.5353
Cluster Map

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value

~ 75 miles
Figure C-126

Contract Labor Expenses 1987

Moran's I = 0.3760
Figure C-127

Contract Labor Expenses 1992

Cluster Map

~ 75 miles

Legend:
- Red: High value next to high value
- Blue: Low value next to low value
- Pink: High value next to low value
- Light Blue: Low value next to high value
Figure C-128
Contract Labor Expenses 1992

Significance Map

~ 75miles
Figure C-129

Contract Labor Expenses 1992

Moran's I = 0.5147

DAR92NORM

W_DAR92NORM
Figure C-130

Contract Labor Expenses 1997

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75miles

350
Figure C-132  
Contract Labor Expenses 1997

Moran's I = 0.4198

Plot showing a scatter plot with the variable W_DAR97NORM on the y-axis and DAR97NORM on the x-axis. The plot displays a linear trend.
Figure C-133

Custom Work Expenses 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Custom Work Expenses 1987

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-135

Custom Work Expenses 1987

Moran's I = 0.6345
Figure C-136

Custom Work Expenses 1992

Cluster Map

~ 75 miles

- High value next to high value
- Low value next to low value
- High value next to low value
- Low value next to high value
Figure C-137

Custom Work Expenses 1992

Significance Map

P = 0.05

P = 0.01

~ 75 miles
Figure C-139

Custom Work Expenses 1997

Cluster Map

~ 75 miles

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value
Figure C-140

Custom Work Expenses 1997

Significance Map

~ 75miles

P = 0.05

P = 0.01
Figure C-141

Custom Work Expenses 1997

Moran's I = 0.6531
Figure C-142
Average Farm Machinery and Equipment Value 1987

Cluster Map

High value next to high value
Low value next to low value
High value next to low value
Low value next to high value

~ 75 miles
Significance Map

- **P = 0.05**
- **P = 0.01**

~ 75miles

363
Figure C-146
Average Farm Machinery and Equipment Value 1992

Significance Map

~ 75 miles

P = 0.05

P = 0.01
Figure C-147

Average Farm Machinery and Equipment Value 1992

Moran's I = 0.6085
Figure C-150  
Average Farm Machinery and Equipment Value 1997

![Graph showing Moran's I = 0.6085]
APPENDIX D – MAP OF INTERVIEW LOCATIONS
VITA

Jacqueline Ann Warren Mills was born April 26, 1976, in Columbus, Georgia. She is a graduate of Brookstone School and completed her undergraduate studies in 2000 at the University of Memphis with a Bachelor of Arts degree in geography. In 2001 she completed her Master of Arts degree in geography, also at the University of Memphis. In August 2001 she began her doctoral studies in the Department of Geography and Anthropology at Louisiana State University where she will complete the Doctor of Philosophy degree in August of 2005.