

PLANNING FOR GREEN GROWTH:
A CASE STUDY OF GATES COUNTY, NORTH CAROLINA

by

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ABSTRACT

In the United States, most discussion surrounding sustainable development has focused on urban areas, but the implementation of sustainable design principles in rural regions is equally important. Gates County, a rural jurisdiction in northeastern North Carolina, is a community proud of its history, agricultural way of life, and unique environmental attributes that include ecologically valuable wetlands, forests, and waterways. With a low median household income and a high poverty rate, however, the region is also in need of economic growth. County residents have been largely united in their opposition to a U.S. Navy proposal to build an Outlying Landing Field (OLF) in the area, and citizens have responded by considering alternative development that would be less environmentally and socially damaging. Citizens and decision makers are therefore faced with the challenge of planning ways in which they can develop sustainably, balancing the needs for economic growth, environmental protection, and cultural preservation.

This study identifies residents' views and opinions of sustainable development, the current strengths and weaknesses of Gates County, and the areas in which growth would be most valuable. Citizens have identified tourism and the establishment of local businesses as vital to green growth and have expressed a strong desire for citizen participation throughout the planning process. When analyzed in light of sustainable development principles and case studies of other rural communities that have overcome similar challenges, these opinions provide insight into how county planners, officials, and residents can satisfy their need for sustained economic improvement while simultaneously ensuring that their environmental and societal resources will persist through future generations. Recommendations are provided as to how Gates County can combine business development, renewable energy, stormwater management, and land use regulations with citizen participation and education to create a comprehensive plan for a sustainable future. While these suggestions are tailored specifically to Gates County, they are designed to serve as a model that can be implemented in other rural areas as well.

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1. INTRODUCTION

In the United States, the majority of the discussion surrounding “green development” has focused on urban areas. Mass transit systems are installed or expanded to reduce commuters’ use of fossil fuels, new office buildings aim to earn LEED certification for their sustainable use of resources, and old buildings are retrofitted with technology such as solar panels, green roofs, and water-saving toilets. While the general desire to green our cities may be increasing as we recognize the effect our actions are having on the environment, the measures taken to do so remain few and far between. Yet they are still far greater than those implemented in rural communities.

The importance of making our urban centers more eco-friendly should not be minimized, but it is equally important to consider such factors in rural areas that are undergoing economic and population growth. After all, small towns and communities are not constrained by the existing, unsustainable development that pervades urban areas, thereby allowing them to “go green” with greater ease. This lets such development occur proactively, rather than attempting to remedy the problem after the fact. And while numerous approaches are available to address the greening of large cities, many of these are neither feasible nor necessary in developing areas.

In order to determine what measures can be taken to help a rural area develop sustainably, the problem can be approached in three different ways. First, research can be carried out on the specific green technologies that would need to be implemented in a rural area. The production of renewable energy such as solar, wind, and biodiesel is actually easier to implement in rural areas due to the abundant space, and the concept of “Zero Energy Homes” is one that can be applied to both rural and urban areas alike (NAHB Research Center, Inc., 2006; Tait, 2006). Many other green technologies exist, and their potential benefits merit further investigation.

Second, while sustainable development in rural areas may not be the primary focus of most literature, it occurs in reality much more often than one might think. In Denmark, Samsø Island’s quest

to reach carbon-neutrality shows just how resourceful a community can be, even without grants, tax breaks, or other benefits (Di Justo, 2010b). Many other towns have taken a smaller-scale approach, incorporating the principles of Low Impact Development into their growth plans. But perhaps the most unique and impressive example of sustainable development is the small town of Greensburg, Kansas, which was devastated by a tornado in 2007 (History & Vision, 2011). In rebuilding the town, residents and officials decided to make it a model green community. While the project is still in its relative infancy, it offers genuine hope that such an endeavor can be successful and serve as a model for similar communities.

Finally, and perhaps most importantly, the community in question must be heavily involved in the planning process. In order for such a project to be successful, citizens and local officials must be intrinsically motivated. As a result, it is necessary to understand their own vision for their future and then figure out the best way to make it a reality through sustainable means. By having citizens and officials identify what it is about other green communities that they like, one can craft a plan that they will support. However, many citizens might initially be opposed to the idea of sustainable development, worrying it would be too costly and would inhibit their potential for economic growth. By educating the community on the benefits—and perhaps necessity—of a sustainable approach and by demonstrating how it would contribute to economic, environmental, and social well-being, it is possible to gain further support for the concept of green growth. Furthermore, by incorporating their own visions into such a plan, citizens will be motivated to see it through.

Through a combination of research, a review of case studies, and direct communication with citizens, I aim to provide a set of recommendations that can serve as the basis for a sustainable development plan in Gates County, a rural community in North Carolina. In addition to benefitting this rural locality, the suggestions can also serve as a model for other communities wishing to pursue green growth.

1.1. Gates County, North Carolina

1.1.1. Background

Located in northeastern North Carolina (see Figure 1), Gates County is steeped in history and still maintains a slow-paced agricultural lifestyle. The jurisdiction, comprising 341 square miles, is inhabited by approximately 12,000 people and contains only one incorporated town (Gates County cities, towns & census designated places, 2011). Despite being rich in land resources, the community is within a one hour drive of the Norfolk-Virginia Beach metropolitan area, Virginia's most populous region and home of several naval facilities. As a result of its proximity to existing installations, Gates County has twice been considered for development by the United States Navy.



Figure 1. Gates County, NC, highlighted in red, is located along the Virginia border in the northeastern part of the state. (Image Credit: Wikimedia Commons)

In 2007, Gates County was identified by the Navy as one of six potential locations for a new Outlying Landing Field (OLF). (This marked the second time it was considered; it had previously been disqualified in 2003 (Citizens Against OLF, 2008).) The OLF would serve as a training ground for pilots to practice touch-and-go landings and would be used for repetitive flight operations. With the facility would come significant noise pollution, wetland destruction and ecosystem harm, and few long-term economic benefits for residents, as civilian employment would be minimal. The core of the proposed OLF contains over 1,200 acres of wetlands and a significant stretch of the Chowan River (Citizens Against

OLF, 2008), a waterway that supports a variety of life and is utilized by residents for fishing and recreation. Additionally, the proposal includes the Chowan Swamp Game Lands, land purchased with citizen tax dollars through various trust funds (Citizens Against OLF, 2008).

Such construction would do little to stimulate Gates County's economy or benefit existing residents. Few, if any, long-term civilian jobs would be created, as work would be performed by active members of the military or outsourced to companies based in other regions of the country. As a result, the apparent "growth" created by an OLF would not be sustainable from an economic, social, or environmental standpoint.

In early 2011, residents and county officials were informed that the Navy would not be taking any further action on the creation of an OLF until at least 2014 (Southern Coalition for Social Justice, 2011), at which time the need for such a facility would be reassessed. With the majority of citizens opposed to the project, decisions made in the next three years could be vital in determining whether or not an OLF will eventually be constructed in the area. Having a sustainable development plan that provides alternatives to OLF construction would serve as a significant deterrent for the Navy in choosing a final site if an OLF is deemed necessary. As a rural community faced with the desire to thrive economically yet still maintain its heritage, quality of life, and environmental health, Gates County is an ideal location for the implementation of a green development plan.

Coincidentally, several months after this project was initiated, Gates County was awarded a grant by North Carolina State University through its Office of Extension, Engagement and Economic Development. The grant provided funding for a series of "Growing Gates" workshops—community gatherings designed to discuss future development in the county. The first workshop, staged in collaboration with the NC State School of Design, served to assess Gates County's strengths and weaknesses in relation to economic development. The resulting ideas will be incorporated into the

county's future strategic planning and will enhance the information base associated with this project (Bryant, 2011).

1.1.2. Economy

Like many rural areas in the southern United States, Gates County residents are relatively poor. While the median household income of \$44,737 is comparable to North Carolina as a whole (\$46,574), nearly 16% of residents live below the poverty line (U.S. Census Bureau, 2010). The majority of the county's economy is invested in agriculture, with cotton, corn, soy, wheat, and peanuts as the primary crops (L. Dickerson, personal communication, March 18, 2011) (see Figure 2). Timber harvesting has also comprised a significant portion of the economy, as various tree species are harvested for lumber and for use in pulp and paper mills (Companies that buy timber in Gates County, 2011). However, while large international producers such as Weyerhaeuser and International Paper have utilized Gates County's timber resources, they have not operated major production facilities in the county and have therefore not had as strong of an impact on the local economy as they might in other regions.



Figure 2. Gates County's economy is based largely on agriculture, of which cotton is a primary crop. (Photo Credit: Laura Dickerson)

Nonfarm businesses, while relatively sparse to begin with, have become even more so in recent years; the county's 132 private nonfarm establishments represent a 5.5% decline between 2000 and 2008 (U.S. Census Bureau, 2010). Residents often travel to neighboring counties for retail shopping, leading to a demand for more businesses within county lines. Incorporating local businesses in a sustainable development plan would help address the needs of residents while simultaneously strengthening the local economy.

Tourism is another way in which Gates County can prosper economically. The area benefits from a variety of unique environments and a number of historical sites.

1.1.3. Environment

Gates County is endowed with a variety of environmental attributes, not the least of which is soil. The region's agricultural history speaks to this fact, and the North Carolina climate allows for the cultivation of a variety of crops that are vital to the county's identity. Non-agricultural land, however, supports a wide range of ecosystems. Gates County's western and southwestern boundaries are formed by the Chowan River (see Figure 3), a major waterway that sustains an array of organisms—including river otter, fish, and endangered mussel species—as well as recreational fishing and boating. Along the banks of the Chowan lies prime habitat for terrestrial organisms such as beaver, black bear, bobcat, migratory and resident bird species, white-tailed deer, and various reptiles, among others.

The county's southwestern section is also home to the Chowan Swamp Game Land, a nearly 11,000-acre preserve that supports hunting, fishing, and boating. A joint effort of the Nature Conservancy, Union Camp Corporation, and Georgia-Pacific Corporation, the game land is now owned and managed by the North Carolina Wildlife Resources Commission, the North Carolina Forestry Foundation, and the North Carolina Division of Parks and Recreation (Chowan Swamp Game Land, 2011). It is characterized by nonriverine swamp forest vegetation—such as swamp tupelo, red maple,

bald cypress, and water tupelo—and mixed forest, including beech, oak, and pine trees. In addition, the game land includes a number of highly diverse, freshwater marshes with large patches of prairie cordgrass, a rare species in North Carolina (Chowan Swamp Game Land, 2011). This area of the county is also home to the Sandbanks—one of the proposed OLF sites—making its future ecological status uncertain.

Meanwhile, the easternmost portion of Gates County contains a section of the Great Dismal Swamp National Wildlife Refuge, a preserve that covers over 112,000 acres of forested wetlands in northeastern North Carolina and southeastern Virginia. The refuge harbors five major forest communities and three non-forest communities which, combined, provide habitat for three rare plant species, over 200 bird species, and 57 species of butterflies, in addition to bear, fox, otter, mink, bat, bobcat, deer, snakes, turtles, lizards, salamanders, frogs, and toads (U.S. Fish & Wildlife Service, 2008).

Gates County's most prominent environmental attribute, however, is Merchants Millpond State Park, located in the center of the county. Similar to the Great Dismal Swamp, yet located entirely within the jurisdiction's borders, Merchants Millpond harbors a rare and unique ecosystem, with a combination of coastal pond and southern swamp forest, across more than 3,200 acres (Merchants Millpond State Park, 2010). The park is characterized by bald cypress and tupelo gum trees (see Figure 3) and supports a variety of organisms, from reptiles and fish—frogs, snakes, turtles, alligators, and two primitive fish species—to birds and mammals, including egrets, owls, turkeys, beavers, bobcats, and otters (N.C. Division of Parks & Recreation). As the only state park in Gates County, Merchants Millpond is a priority for preservation.

1.1.4. Society, History, and Culture

Gates County's rich history has led to significant pride amongst its people. Settlement began as early as the mid-1600's, and many of the simple ways of life have persisted over the past several centuries. Farms have been passed down through generations and, consequently, the county can boast

24 “Century Farms,” establishments that have been owned and operated by the same family for at least 100 years, with more in the process of obtaining certification (Citizens Against OLF, 2008). Not surprisingly, these farms are complemented by a number of historical homes, churches (see Figure 4), and other buildings, six of which are listed on the National Register of Historic Places, with hundreds of others eligible (Citizens Against OLF, 2008).



Figure 3. Gates County supports a variety of ecosystems, including (a) the Chowan River and (b) Merchants Millpond State Park. (Photo Credits: (a) Brian Cohen; (b) <http://en.wikipedia.org>)



Figure 4. Built in the 1870's, Stoney Branch Baptist Church is one of the many historic structures in Gates County. (Photo Credit: Laura Dickerson)

In addition, Gates County was home to seven Rosenwald Schools. These schools were established with the help of a private fund in the early twentieth century to provide educational opportunities to underserved, rural black children. While several of these sites have been converted for other uses, two of the schools are still standing today (Phillips, 2005). The existence of these schools, combined with the county's role in the Underground Railroad (Bryant, 2011), indicates a longstanding culture of tolerance and acceptance and provides insight into the county's role in the history in racial relations in the United States.

The area's agricultural history and well-rooted families foster a strong sense of local pride that has produced a remarkably cohesive community. Residents feel strong ties to their neighbors, land, and geographic location. This pride is supplemented by a number of recreational opportunities in the county, including boating, fishing, hunting, and the general enjoyment of nature. It is therefore not surprising that, while Gates County citizens are in favor of economic development, they do not want it to occur at the expense of their heritage and the environment.

2. METHODS

As a relatively new field, there is still much to be learned about sustainable development. Projects have been implemented all over the world; some have been successful while others have not. It would be imprudent to recommend a plan for green growth without reviewing previous research and attempts at sustainable development. This report therefore examines prior literature on the topic as well as case studies of towns in which the principles of sustainable growth have been put into practice.

It would also be impractical, however, to recommend a plan for sustainable development without the input of the very citizens who will be directly affected. For this study, citizen input was obtained in two ways: comprehensive surveys and individual interviews. The former provided the vast

majority of information gathered on personal views, while the latter were used to target community leaders within the county.

2.1. Literature Review

Even though sustainability planning is a relatively young discipline, significant research has been carried out on its underlying tenets and implementation. Between green technologies, planning for smart growth, and general community design, literature on the subject is plentiful and provides a base of information on which Gates County can construct its own plan for sustainable growth.

Of equal importance to the success of the county's sustainability endeavors are the model communities that have already achieved—or are on their way to achieving—their sustainability goals. As such, this report presents a review of relevant case studies, their successes, and the ways in which they can be applied to Gates County.

2.2. Surveys

A comprehensive online survey was created to gather insight on citizens' views on the three primary components of sustainable development: environment, economy, and society. Residents were asked for their perception of the importance and current state of these components, as well as their thoughts on possible areas for future development. The complete survey instrument can be viewed in Appendix A, but note that not all respondents answered all questions; two of the questions implemented skip logic, allowing respondents with certain answers to bypass irrelevant questions.

2.2.1. Survey Composition

The survey was designed with the residents in mind in order to achieve an appropriate balance between collecting sufficient data and keeping the survey to a reasonable length. In order to provide clarity and organization, the survey was divided into eight separate sections, each of which is described in detail below.

A. Introduction/Consent

Participants were immediately informed of the nature of the study and notified that their responses would potentially be used to shape future development decisions in Gates County, NC. In addition, they were assured that their privacy would be maintained and that no information would be released that would link them to their answers. Furthermore, while participants would have the option to provide their email address or phone number at the conclusion of the survey for a chance to win a prize, they were told that this information would be stripped from the remainder of the data.

Participants were informed of the expected time commitment and that they may exit the survey at any time. Importantly, it was also noted that the survey was not affiliated with the Gates County government or any non-governmental organization. Finally, in order to comply with institutional review board standards, participants had to certify that they were at least 18 years of age.

B. Background Information

This section of the survey provided background information on Gates County and the ongoing battle with the United States Navy over the potential construction of an OLF within the county. While the majority of residents were expected to have known this information, it was nonetheless provided to ensure that all survey takers shared at least a minimum level of familiarity with the controversy over economic development, environmental health, and cultural preservation and how this controversy has spurred discussions about future growth in the area.

C. Importance Rankings

Residents were asked to rank, in order of perceived importance, the three components of sustainable development and the various sectors within them, as well as the current state of these sectors in Gates County. As a lead-in to the following section, they were also asked a

simple question about their familiarity with the terms “sustainable development,” “green growth,” and “green development.”

D. Views on Sustainable Development

This section was designed to gain insight into how important Gates County residents view the concept of green growth, as well as which groups they feel should have the most input in the planning process.

E. Potential Improvements

Respondents were asked to choose the types of businesses they feel would be in the best interest of Gates County. The options provided were explicitly chosen to highlight the differences between small, local businesses and large, national chains. This section also examines the perceived benefits of increasing tourism in the area and the potential ways in which one might do so.

F. Demographic Information

Citizens were asked to provide basic demographic information, including the length of time they have lived in Gates County and their political affiliation.

G. Comments

Following the formal questions, respondents were given the opportunity to add any additional comments.

H. Prize Drawing

After completing the survey, participants were invited to enter their contact information for a chance to win a nominal cash prize in the form of an American Express gift card. The opportunity to win a prize was used to promote the survey and entice participation.

2.2.2. Recruitment

Sample

A random sample of Gates County residents was selected from a local phone book. Phone numbers beginning with one of the two prefixes representing Gates County (357 and 465) were isolated and, of these, every 14th entry was chosen to create a sample size of 205. If a selected phone number did not have a corresponding address, it was replaced with the next usable Gates County number. For listings with two names (presumably representing a married couple), a random number generator was used to determine whether the first or second name would be selected.

Initial Outreach

Postcards containing information about the survey were then mailed to the randomly selected addresses. The cards were chosen as an economical, time-conscious, and straightforward way to direct people to the online survey. Each card contained a colorful photo on the front encouraging recipients to “Help make Gates County a better place!” and advertising the opportunity to win an American Express gift card. The back contained a description of the project and a Uniform Resource Locator (URL) that would lead them to a blog containing a link for the survey (see Appendix B). The intermediate step of creating a blog site was chosen so that a simple website, as opposed to the complex URL of the actual survey, could be printed on the postcards and easily typed in a Web browser by the recipients.

Snowball Sampling

After receiving an unsatisfactory response rate of less than 9%, additional participants were recruited through snowball sampling. Members of the Citizens Against OLF group in Gates County sent e-mails with a link to the survey to their contacts residing in the county. This unfortunately negated the randomness of the survey sample, but was the best option available given the circumstances. This secondary effort led to a significant increase in responses, resulting in a total sample size of 44 residents.

2.2.3. Results

Survey results were analyzed both quantitatively and qualitatively, and are presented in the ensuing sections. Information summarizing these results was also posted to the blog site containing the survey. This information was made available to provide feedback to those who took the survey and also to encourage future discussion about sustainable development in Gates County.

2.3. Interviews

Interviews were conducted with two community leaders in Gates County, both in person and via e-mail. Informal talks with these residents aided in interpreting survey results and gaining a broader understanding of the goals, preferences, and challenges shared by community members.

3. OBSERVATIONS & RESULTS

Observations and results are discussed in three sections: sustainable development principles, concepts, and ideas; case studies; and citizen input.

3.1. Principles of Sustainable Development

“Sustainable development” is a term recognized by many but oftentimes not fully understood. While a number of definitions exist, one of the most commonly accepted was given by the World Commission on Environment and Development, otherwise known as the Bruntland Commission, in 1988 (Zaki et al., 2000). The group referred to sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987). In other words, the term is based on intergenerational equity; those alive today should be able to use resources in a way that enhances their quality of life, but not so haphazardly that it will negatively affect their successors.

In an attempt to achieve this balance, sustainable development focuses on three primary sectors: environment, economy, and society. All three must be taken into account when making decisions and balanced to ensure that growth proceeds in a way that will benefit both current and future generations. Sustainable development comprises a variety of disciplines and areas of study, many of which are discussed in the following sections.

3.1.1. General Design Principles

Sustainable development can take many forms, but there are several principles that should be incorporated into any plan. First, mixed-use communities are an appropriate solution to addressing the harms of suburban sprawl (Kinsley & Uncapher, 2000). By including residential, retail, and office buildings in the same area, a community requires less infrastructure in the form of roads, preserves more open space, and becomes more walkable, reducing the reliance on automobiles and their associated greenhouse gas emissions. Incorporating schools, civic facilities, and public parks can also help foster a sense of community and social well-being.

Second, local businesses that provide a range of job types are key to sustaining a community economically, environmentally, and socially (Kinsley & Uncapher, 2000). Local businesses help money stay within the community rather than outsourcing it to national or international corporations, and local ownership is typically more likely to hire local workers and increase employment within the community. Additionally, local businesses generally engage in more local sourcing, leading to a reduction in the amount of transportation of goods that must take place and decreasing the use of fossil fuels required by shipping. Finally, from a social standpoint, local establishments help foster pride in one's community and are the basis for maintaining the uniqueness of commercial areas in small towns. However, it should be noted that a company can still maintain its path to sustainability if it decides to recruit outside businesses, so long as it pursues companies that share similar values and will produce net benefits for the local area (Lovins A.B., 2003).

In addition to having a variety of building uses, it is also important to maintain a diversity of housing types (Kinsley, 2007). Mixed-income developments help prevent socioeconomic stratification, enhancing both the social equity and economic flow of the community. Diverse developments can also help foster pride in one's community.

From an environmental standpoint, a sustainable community must work to conserve resources, minimize waste, and preserve the natural terrain, vegetation, and drainage systems that help manage stormwater (Kinsley & Uncapher, 2000). Installing energy-efficient technology, whether active or passive, will reduce resource use and lead to long-term savings in energy costs. While some green technology may require a larger initial investment than traditional technologies, the resulting savings over the long term make them a sound economic decision (Kinsley & Uncapher, 2000). This is an important piece of information to convey to those skeptical of sustainable development. Amory Lovins, cofounder of the Rocky Mountain Institute, argues that “[s]ome of the biggest development barriers are in our head ... [s]uch as the very widespread assumption ... that green and efficient technology always costs more” (Lovins A.B., 2003). Getting this point across to the entire community can help garner support for sustainability-minded projects.

3.1.2. Stormwater

Surface runoff of stormwater is a major cause of pollution in both urban and rural areas, as water picks up contaminants such as oil and fertilizer and delivers them to local streams and rivers. One proven way to mitigate this problem without necessarily preventing growth is through Low Impact Development (LID), an approach to stormwater management that works with nature (Low Impact Development (LID), 2011). By treating stormwater as close to its source as possible, LID creates a natural, functional treatment system while also improving neighborhood aesthetics.

The logic behind LID is a mimicking of natural processes. Water is managed in such a way that promotes its natural movement through an ecosystem, regardless of how developed or undeveloped

the surrounding landscape is (Low Impact Development (LID), 2011). LID is based on an understanding of natural systems and the physical, chemical, and biological processes that take place within them (Natural Resources Defense Council, 1999). LID mimics natural physical processes by stabilizing soils, reducing erosion, and increasing interception, infiltration, and evapotranspiration; chemical processes are aided through increased adsorption, ion exchange, and organic complexing; and biology is mimicked through increased transpiration, nutrient-cycling, and microbial decomposition (Natural Resources Defense Council, 1999).

In most cases, the end results of these practices are mutually beneficial. Rain gardens—depressed areas with water-tolerant plants that capture and filter stormwater—both reduce pollution and add to the aesthetics of residents' yards (Natural Resources Defense Council, 1999). Similar installations can be made along sidewalks and roadways. Rooftop gardens serve a related purpose, capturing rainwater and putting it to use before it has a chance to run off the property (Natural Resources Defense Council, 1999). Even without gardens, the impact of impervious roof surfaces can be mitigated by disconnecting storm pipes leading from gutters to the ground, thereby allowing water to naturally flow from the roof to the yard. Alternatively, homeowners could connect gutters and pipes to rain barrels or cisterns and store rainwater for future use. Finally, permeable pavements can be installed instead of traditional, non-porous surfaces (Natural Resources Defense Council, 1999). This simple change allows stormwater to seep into the ground, thus decreasing runoff and its associated pollution.

LID is a popular sustainable stormwater practice because its benefits can be achieved at a relatively low cost. In most cases, LID is flexible, economical, and effective (Natural Resources Defense Council, 1999). It enhances the local environment by protecting wetlands and improving wildlife habitat, protecting public health, improving quality of life through aesthetics and an enhanced sense of place, and reducing flooding (Natural Resources Defense Council, 1999). With lower construction costs

and fewer environmental impacts, LID is a smart alternative to traditional stormwater management systems.

3.1.3. Energy

Energy is perhaps the most frequently discussed aspect of sustainable development today. The United States and the majority of the developed world are highly reliant on fossil fuels such as oil, coal, and natural gas. People depend on these resources to heat and cool their homes, power their factories, run their automobiles, and provide artificial light. The burning of fossil fuels, however, is unsustainable in two different respects. First, it increases atmospheric concentrations of carbon dioxide, the primary driver of global climate change and its untold environmental, economic, and social effects. Second, as nonrenewable resources, fossil fuels are in finite supply. While estimates of the world's reserves vary widely, there will undoubtedly come a time when the supply of fossil fuels can no longer meet the demand, a demand that will only increase as population grows and as developing nations increase their consumption. Even before this point is reached, cost may become prohibitive as resources become increasingly scarce.

There are a number of viable alternatives to fossil fuels that have been implemented around the world. Wind power—the harvesting of wind's kinetic energy by large turbines (Wind Power, 2011)—is especially useful in areas subject to frequent winds, such as flat land, offshore, or along mountain ridges. Similarly, solar power, in which photovoltaic panels capture sunlight and convert it to an electrical current (Locke, 2008), is another form of energy that comes from a free and renewable source, and one that has no atmospheric emissions. Both wind and solar power require larger initial investments than traditional forms of energy production but can save consumers significant amounts of money over the long term. Over time, as technology improves, these two energy sources will become even more cost-effective.

Solar energy can also be utilized in a much simpler fashion through architecture and design. Passive solar design requires no photovoltaic panels or additional equipment, and instead entails designing a building in such a way that maximizes or minimizes exposure to the sun (Passive solar design, 2011). Building orientation, operable windows, thermal chimneys, and thermal mass—materials that can store heat for an extended period of time—are all examples of passive solar design and require little to no maintenance (Passive solar design, 2011). In regions that lack the initial capital to convert to solar power—and even those that do not—passive solar is an effective and appropriate alternative; it reduces energy use and, consequently, costs.

Various other technologies exist that transform renewable resources into electricity. Hydropower captures the kinetic energy in moving water and can be implemented in river basins or in coastal areas affected by tidal action. Geothermal power, which captures heat from the Earth itself, is often associated with volcanic regions but can also be implemented in shallow depths in many parts of the world. Even plants can be converted to biomass energy through simple burning (Union of Concerned Scientists, 2010).

Limitations do occur for these technologies, as their viability is largely dependent on factors such as climate and geographic location. Furthermore, while these technologies are generally viewed as more environmentally benign, they are not without their impacts. Wind turbines, for example, can be fatal to birds, while the construction of dams for hydropower is typically associated with adverse habitat modification. Each potential project must be analyzed on its own merits, but it is undeniable that these technologies, when implemented responsibly, can result in significant environmental benefits.

3.1.4. Ecosystem Services

Many scientists argue that the biggest challenge to sustainable development is the loss of ecosystem services, or “the natural capital that enables the planet to sustain life” (Lovins & Link, 2001). In the past 100 years, the world has lost half of its wetlands and forests and 70% of its major marine

fisheries (Lovins & Link, 2001). These habitats, among others, provide countless benefits to humans, including water and air purification, timber, food, medicine, flood mitigation, erosion prevention, waste decomposition, pest control, biodiversity maintenance, and soil preservation (Ecological Society of America, 2000). Since the benefits they provide occur free of charge, it is inherently difficult to put a price on ecosystem services. However, once destroyed or compromised, many cannot be restored, leading to greatly increased costs in the future when technological innovation is the only potential substitute. For this very reason, it is paramount that a sustainable development plan takes ecosystem services into account and limits the activities that threaten them the most. Addressing issues such as polluted runoff, air emissions, overharvesting of resources, wetland destruction, soil erosion, deforestation, and sprawling development (Ecological Society of America, 2000) should be made a priority.

3.1.5. Land Use Regulations

One of the major roles that local governments can play in sustainable growth is enacting legislation regulating land use. Requiring infill, in which land in the most developed area is used before expanding to more distant areas, helps concentrate development and prevent suburban sprawl. This can be done through the establishment of urban growth boundaries and zoning regulations (Kinsley, 2001). If expansion does extend to outlying areas, governments can use the resulting tax revenues to reinvest in sustainable practices (Kinsley, 2001).

3.1.6. Natural Capitalism

By integrating environmental with economic issues, sustainable development can be made attractive and profitable to businesses. Michael Kinsley, Senior Consultant for Sustainable Communities at the Rocky Mountain Institute, argues that natural capitalism embodies four principles: investment in resource productivity through efficient use; a shift to biologically inspired economic models through the

reuse and recycling of materials and resources; reinvestment in natural capital through the restoration of natural systems; and sustained, long-term growth that incorporates environmental costs in calculating net gains (Kinsley, 2001).

3.1.7. Collaborative Environmental Planning

One approach to sustainable development that is becoming increasingly popular is Collaborative Environmental Planning (CEP). Whereas traditional environmental planning is based largely on natural sciences and economics, CEP takes a more comprehensive approach, attaching significance to the wide range of societal values and concerns about the environment and emphasizing long-term resource management (Zaki et al., 2000). CEP also incorporates a broader, more inclusive definition of “ecosystem” in planning for sustained environmental health.

What differentiates CEP from other methods is its focus on society and the perceived importance of involving all stakeholders in the planning process (Zaki et al., 2000), thus accounting for all three primary components of sustainable development. Achieving the proper balance is apparently even more important in rural communities; Zaki et al. note, “For rural resource-based economies, the environment provides their livelihood and they must change the way that they interact with the environment. These areas must view environmental protection and economic development as one in the same, rather than as two irreconcilable goals” (2000). While the authors’ research focuses on communities in developing nations, their conclusions are just as applicable to agricultural communities in the United States.

3.1.8. Planning and Implementation

While each of the above topics is important to achieving sustainable growth, none could be implemented effectively without appropriate planning. Proper planning for sustainable development necessitates the collaboration of citizens, government, and businesses so that the interests of all

stakeholders can be addressed. Working together, communities should establish common goals and develop ways to measure progress toward those goals (Kinsley, 2007). Methods should be clearly laid out, which can be achieved through a formal community sustainability plan.

Residents of all backgrounds should be included in the process, and the more participation there is, the greater the likelihood that a plan will be successful. Participation can be encouraged through community entrepreneurship and local business networks, through which companies and individuals can share information, ideas, and techniques for sustainable businesses, as well as implement projects and work together to influence local government decisions (Kinsley, 2007). Furthermore, it is prudent to address businesspeople's views on sustainable development, as those focused primarily on economic gain sometimes view green growth as restrictive and incompatible with economic advancement (Kinsley, 2001). Training and educational outreach can also be used to increase the involvement of the mass public. By teaching residents about sustainable development and the actions they can take to contribute to community goals, one can foster leadership and civic capacity that can subsequently spread to other members of the community (Kinsley, 2007).

Finally, developers, planners, and residents must maintain flexibility in their plans so that they can adjust to changing circumstances. Revisiting past decisions and analyzing their effectiveness is a valuable learning tool, one that allows communities to adapt to unexpected situations and alter their plans accordingly (Kinsley, 2007). This form of continuous learning is much more likely to lead to the achievement of sustainability goals than a rigid approach would be.

3.2. Case Studies

3.2.1. Greensburg, Kansas, United States

Greensburg, a town of roughly 1,400 people in southwestern Kansas, was leveled by an EF5 tornado on May 4, 2007 (BNIM Architects, 2008; Background, 2011). With over 90% of the town's buildings destroyed (see Figure 5) and an already declining population (Hart, 2011), residents and

officials agreed that significant changes were necessary to sustain the town for future generations. They decided to rebuild with a focus on sustainable development (BNIM Architects, 2008), which led to the town being named the United States' most promising carbon-neutral community project in 2010 (Di Justo, 2010a).

Greensburg's goal to become a socially, economically, and environmentally sustainable city has shaped its planning decisions, some of which have already been implemented and others of which are still in the early stages. Regardless of the current status of the various projects, however, Greensburg residents and officials have successfully incorporated sustainable development into the town's identity. A city mandate ensures that rebuilding will be done in accordance with LEED (Leadership in Energy and Environmental Design) Platinum specifications—the most stringent within the green building certification system—but all other sustainability-focused projects have been community-driven and undertaken by choice (Hart, 2011). To date, seven LEED-certified buildings have already been completed, resulting in an impressive citizen to LEED building ratio of 129 to 1 (Hart, 2011) (see Figure 5).

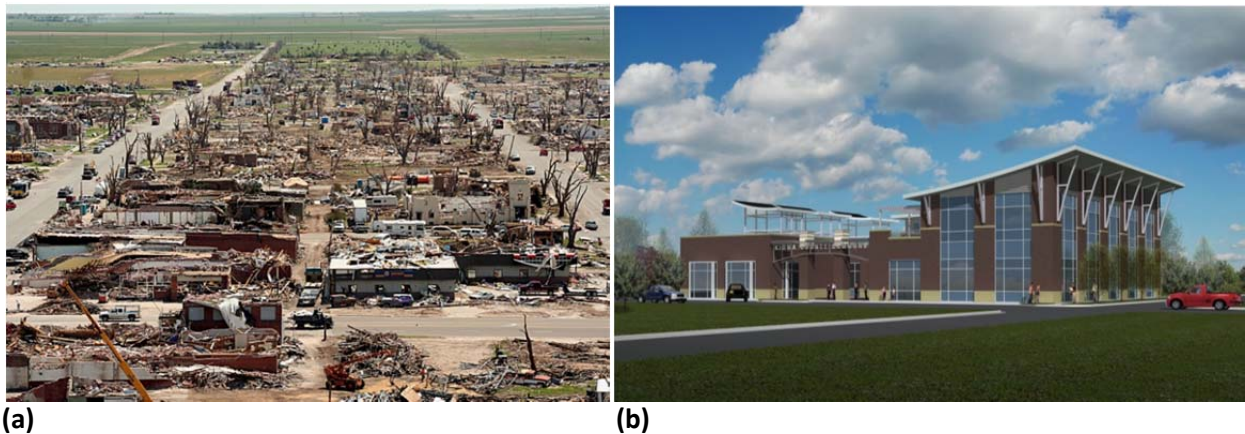


Figure 5. Greensburg has made significant progress in just a few short years. (a) The town is completely destroyed by a tornado in 2007. (b) Seven LEED Platinum buildings have already been completed with more on the way, including Kiowa County Commons. (Photo Credits: (a) <http://greenconstructionuk.wordpress.com>; (b) www.greensburggreentown.org)

Greensburg is also characterized by its energy independence. The Greensburg Wind Farm, a 10-turbine facility that began operation in March 2010, generates enough electricity to power 4,000 homes (Hart, 2010a). With greater supply than demand, the town is able to sell excess electricity to other nearby towns, producing economic growth. In March 2011, the wind facility was named “Wind Project of the Year” at the Renewable Energy World North America Conference and Expo (Bussert, 2011).

Of perhaps greater significance is the overarching community design and the desire to create green neighborhoods. Even though Greensburg is a small, rural town, it still maintains a focus on infill development (Tavel et al., 2010), siting new development within the already-urbanized area, rather than building outward and using additional land resources. This process inhibits suburban sprawl and creates communities that are more walkable, better connected, and less energy-intensive.

Sustainable town planner Michael Tavel assembled a team of volunteers to plan three separate communities within Greensburg (Hart, 2010b), indicating that such a project can be carried out with minimal economic resources. The plans created account for energy and water conservation, local food provision, and the construction and maintenance of strong social bonds. They include venues for public gatherings to enhance social health, passive solar homes with vegetable gardens to limit resource use, simple stormwater management technology to reduce pollution from runoff, and plans for farmers’ markets and Community Supported Agricultural projects to aid both economic and environmental health. The team believes that citizen input is paramount in such an endeavor and has heavily incorporated public comments and suggestions into the town’s plan (Hart, 2010b). Finally, due to the incorporation of green technology, energy and tax savings offset \$45,000 of the cost of each home, making them affordable to a significant proportion of citizens (Tavel et al., 2010).

What is perhaps most stunning about Greensburg’s sustainable development plans, however, is its focus on community participation in every step in the process. Greensburg residents are generally proud of the rural quality of their community and excited about the opportunity to rebuild in a way that

provides jobs, education, and recreation while still maintaining the quality of life that they enjoy (BNIM Architects, 2008). County officials and developers understand this and have ensured that every recommendation included in the town's master plan has come from the citizens themselves. In fact, the authors of the plan went so far as to explicitly state, "Citizen groups are essential to the continued implementation of this Plan" (BNIM Architects, 2008, p. 6).

Much of the community participation can be attributed to Greensburg GreenTown, a grassroots organization spearheading the town's sustainability movement (Background, 2011). The group has worked with businesses and government officials in serving as an educational resource for the community, and has interviewed residents to gather information on what aspects of community sustainability are most important to them. Its goals are to make sustainable living more appealing, enhance community involvement, increase the ease with which builders and businesses can operate sustainably, make it easier for residents to use green practices, and spur economic development with an emphasis on environmental and community health (Background, 2011).

Greensburg is becoming a community truly created by its residents, with citizens feeling invested in the rebuilding process. The focus on sustainable development has also resulted in a benefit unexpected by many. As a result of its unique circumstances and desire to become a model green community, Greensburg is quickly becoming a tourist destination. In a town of less than 1,000 people, even a small increase in tourism can lead to major economic gains and, by creating a place where others want to live, work, and visit, the people of Greensburg have found a way to improve their economic and environmental standing while simultaneously preserving the rural way of life that they cherish.

3.2.2. Samsø Island, Denmark

Samsø, a 114-square-kilometer island located west of Copenhagen in the North Sea, has become the model community for sustainability in Denmark. Not surprisingly, Samsø relies heavily on wind power—a major component of the coastal nation's climate—and was able to achieve carbon neutrality

just ten years after setting its goals (Godoy, 2009). However, what makes the town unique is its residents' commitment to leading a green lifestyle, which extends far beyond their harnessing of wind power.

In 1997, Samsø and its 4,000 residents won a national competition to become a prototype community for renewable energy resources (Godoy, 2009). In doing so, they agreed to attempt to run their farms, power their businesses, and lead their lives in ways that are entirely energy self-sufficient (McNamara, 2007). The island achieved its goal in 2007, just ten years after being completely reliant on oil and coal (Godoy, 2009). In addition to operating the 21 wind turbines constructed on the island (Di Justo, 2010b), Samsø burns locally grown straw in central plants to produce hot water and also uses solar panels to heat water that is subsequently pumped to homes (McNamara, 2007) (see Figure 6).

The decisions made by individual citizens at the household level are equally important. Many tractors and other pieces of farm equipment are powered by biodiesel fuel that is locally produced, and many homes have solar panels, geothermal heating, and biomass-fueled boilers. In fact, residents are so committed to reducing their environmental impact that they even sequester heat from cows' milk and use it to help heat their homes (Godoy, 2009). The town is currently studying systems that recycle gases and waste from livestock for use as energy and fertilizer.

Like Greensburg, Samsø's drive toward sustainability was motivated largely by the community itself and its determination to serve as a model green community. With a high degree of resident participation in the restructuring process (Godoy, 2009), citizens became personally and even economically invested in the project by selling and buying shares in the wind turbines. As a result, the production of local energy also produced local profits (McNamara, 2007); the island now produces more electricity than it consumes and sells its surplus to the mainland, reinvesting the income in local renewable energy (Godoy, 2009). Smart planning and the commitment of community members have allowed the project to become a success and exceed expectations; few would have imagined that a

small island community could become completely self-sufficient with the majority of long-term investments in green technology originating from the residents themselves (Samsø – Denmark's renewable energy island , 2008).



Figure 6. (Clockwise from top left): photovoltaic panels convert solar radiation to electricity on Samsø Island, Denmark; Samsø's offshore wind farm has allowed the island to achieve energy independence; livestock graze near solar panels, allowing the land to serve multiple purposes and reducing the need for maintenance; farmland and wind turbines coexist on the island. (Photo Credits (clockwise from top left): www.jetsongreen.com; www.househunting.ca; www.livinglightly.ca; <http://ec.europa.eu>)

3.2.3. Low Impact Development

Numerous communities in the United States have implemented Low Impact Development (LID) principles in planning their growth. In all cases, significant environmental and, oftentimes, economic

benefits were realized. It is important to note that all actions taken were simple, cost-effective measures that could be implemented in new developments or retrofitted in old ones.

The Pembroke Woods Subdivision in Frederick County, Maryland, incorporates total LID site design, serving to reduce runoff and diminish peak stream discharges and flooding downstream. Two-and-a-half acres of undisturbed open space and wetlands were preserved in the subdivision, aiding in the control of stormwater runoff, and 3,000 feet of roads were converted to “rural” roads. Streets were narrowed from 36 feet to 30 feet, thereby reducing the area of impervious surface cover, and curbs and gutters were replaced by vegetation to catch, collect, and filter runoff from the roads. Through these techniques, developers were able to improve environmental quality while reducing infrastructure costs by roughly \$200,000 (Natural Resources Defense Council, 1999).

Likewise, in Sherwood, Arkansas, developers of the Gap Creek subdivision realized the economic and environmental benefits of implementing LID principles in their design. Planners left the 130-acre community with significant amounts of open space and recreational areas and incorporated a network of environmental buffers to protect sensitive zones (Natural Resources Defense Council, 1999). The LID approach greatly reduced costs for the developers as it required less clearing and grading, less infrastructure such as curbs, pipes, and gutters, less street paving, and less landscaping. In addition to the cost savings, the enhanced aesthetics of the project actually led to increased property values.

Furthermore, designers of Jackson Meadow, a 64-home residential development in Marine on St. Croix, Minnesota, included more than 100 acres of open land to serve as recreational space and wildlife habitat. The area also features a communally constructed wetland that provides habitat, stormwater storage, and filtration of runoff. Reduced impervious surface cover and natural ponding are incorporated throughout the community as well in order to capture and filter runoff (Green development success stories, 2004) (see Figure 7).



Figure 7. The homes of Jackson Meadow incorporated LID through reductions in impervious pavement, among other initiatives. (Photo Credit: <http://remodelista.com>)

A more comprehensive approach was taken in Davis, California, in the 1970's with construction of the Village Homes development (see Figure 8). Like Pembroke and Gap Creek, Village Homes incorporates natural drainage swales instead of concrete civil works, allowing for increased stormwater retention and filtering (Lovins A.B., 2000). Choosing vegetation in place of curbs and other structures saved developers approximately \$800 per house, which was subsequently allocated toward the creation of organic gardens, orchards, and parks. Revenues from the sale of these crops were then invested in community maintenance (Lovins A.B., 2000). This overarching system of a locally managed economy has led to lower utility and food costs, enhanced interaction around common areas, and a greater sense of interconnectedness (Kinsley & Uncapher, 2000). Village Homes serves as a good example of how LID can save a community money and allow it to invest in additional projects that further improve economic, environmental, and social well-being.

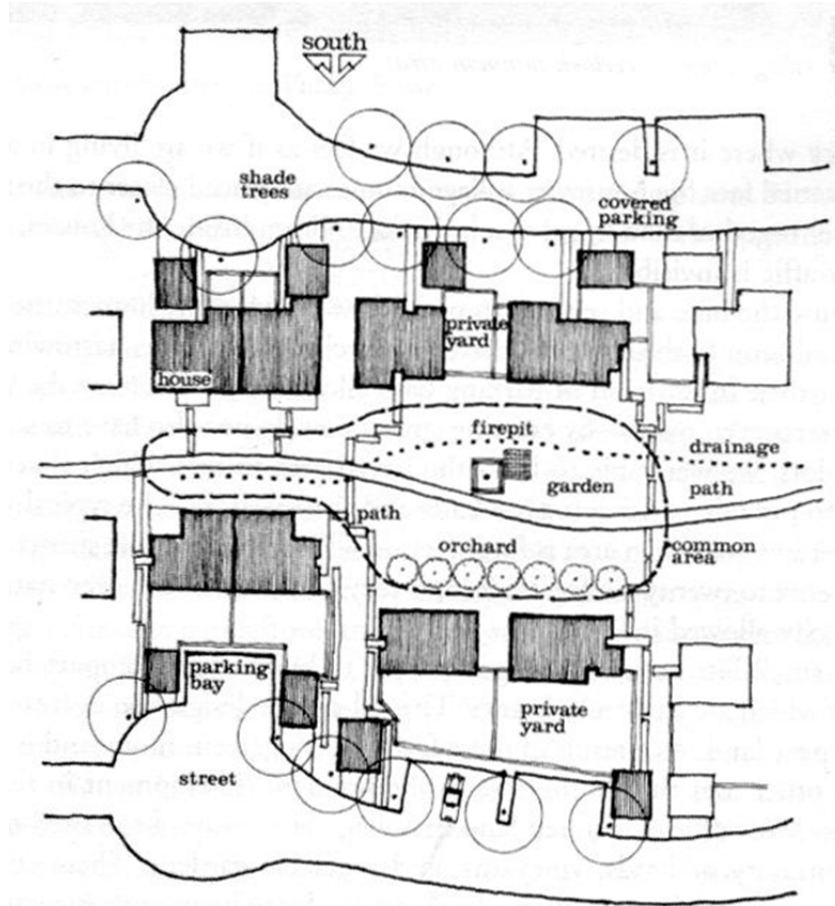


Figure 8. The Village Homes community incorporates many aspects of sustainable development, including natural drainage, social spaces, and local food provision.
(Image Credit: www.eslarp.uiuc.edu)

Finally, developers in St. Paul, Minnesota, took a slightly different approach to implementing LID. Instead of promoting LID throughout the community, they focused on creating a single feature that would serve the same purpose. Their construction of the Maria Bates Rain Garden was beneficial in a number of ways. First, it aided environmental health by filtering water, protecting wetlands, and preventing erosion downstream. Second, it benefited society by improving aesthetics and serving as an outdoor classroom through which environmental stewardship can be taught (Natural Resources Defense Council, 1999). Finally, with a total cost of only \$19,000 for both design and construction (Natural Resources Defense Council, 1999), the undertaking was a sound economic investment that saved the

city money that otherwise would have been needed to mitigate future problems. This project proves that LID can be effective even when implemented on a small scale.

3.3. Citizen Input

3.3.1. Surveys

The surveys provided a wealth of information specific to Gates County. This information is perhaps the most vital out of all data collected, as it represented the interests of Gates County residents themselves—those who will help determine the future direction of development in the region.

The sample obtained consists of a diverse group of residents, including a nearly even number of females and males (23 and 21, respectively), and representation from each of the six primary zip codes in Gates County (see Figure 9). Not surprisingly, most hailed from the eastern section of the county, which is where higher population densities occur. There was also a fairly even distribution of ages, with a slight skew toward individuals between the ages of 48 and 67 (see Figure 10). No respondents were between 18 and 27, which may be attributable to the fact that younger individuals are less likely to be listed in a phone book.

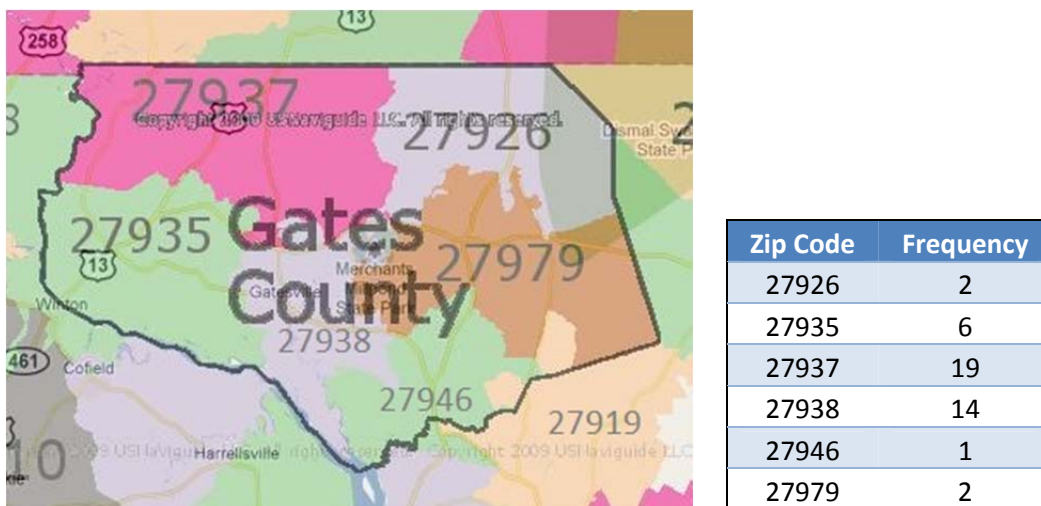


Figure 9. Distribution of respondents among zip codes. (Image Credit: www.zipmap.net)

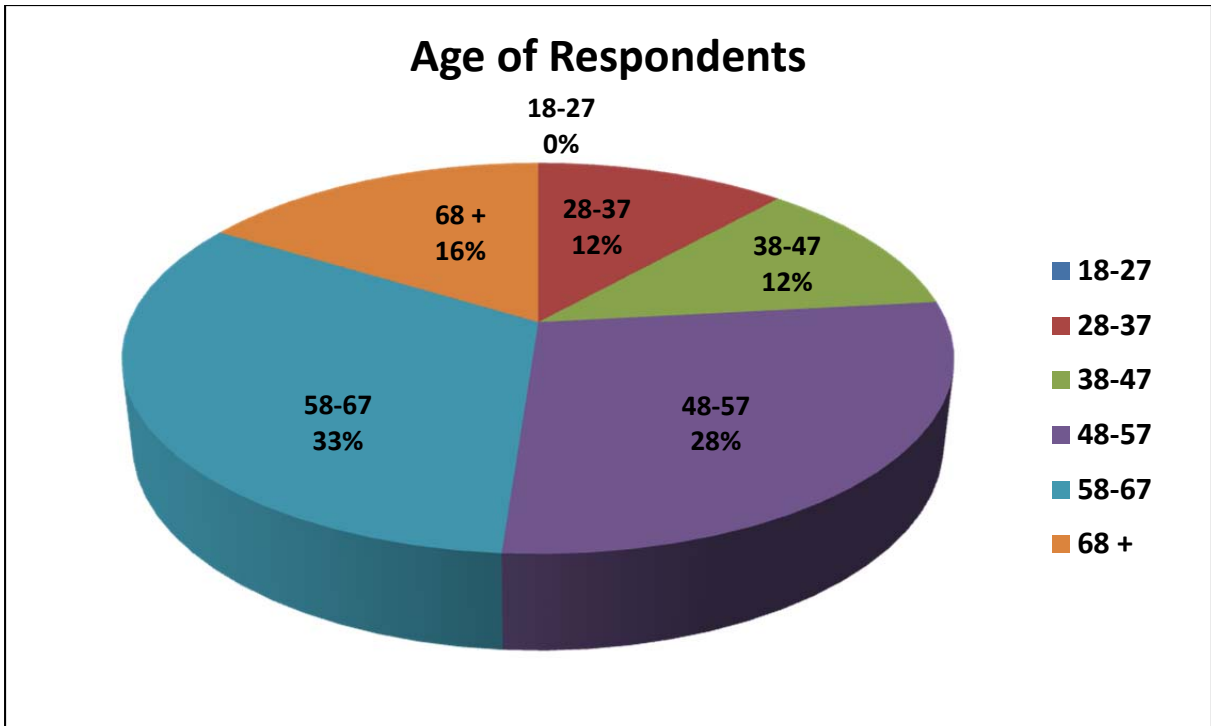


Figure 10. Age distribution of survey participants.

Residents included in the survey were well-acquainted with the region, as 68% have lived in the county for more than 20 years and all have maintained residency for at least one year (see Figure 11). In addition, respondents had anywhere from 0 to 5 children, with an average of 1.88 children per survey taker. Finally, Figure 12 provides a breakdown of respondents' political affiliation. Just over half identified as Democrats, with nearly one-quarter representing Republicans. This generally reflects the political preferences of Gates County, which has tended to support Democrats in recent elections.

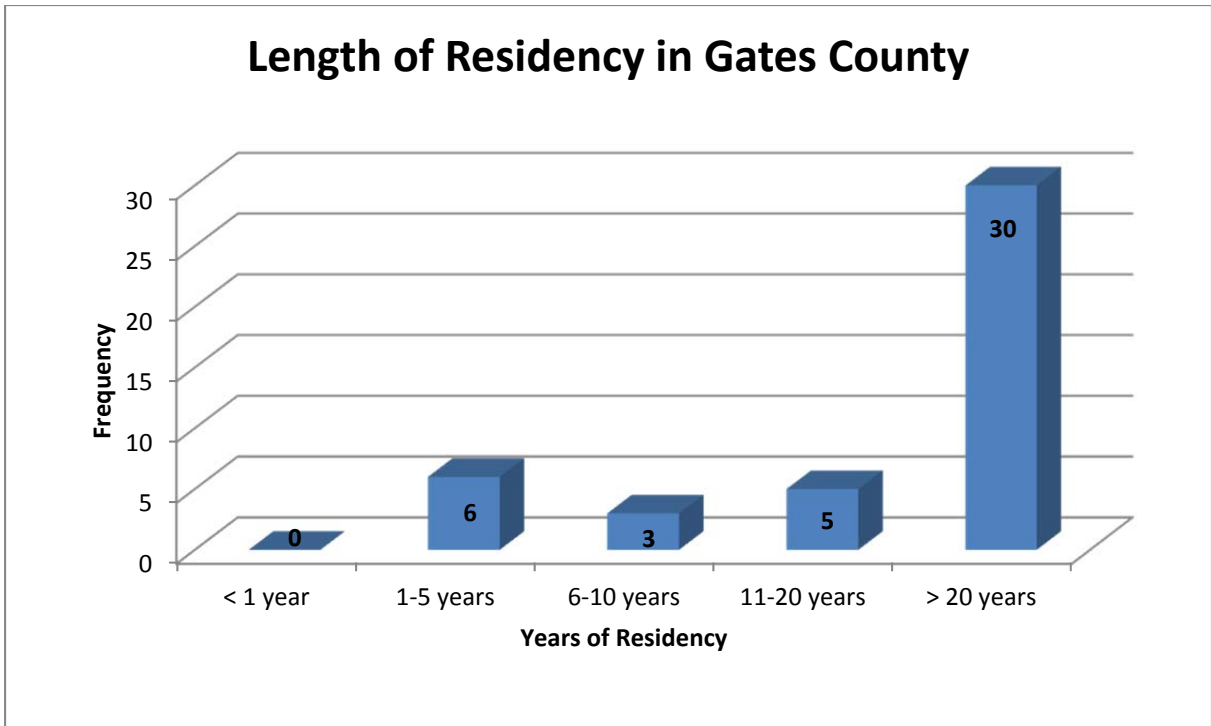


Figure 11. Number of years for which survey respondents have resided in Gates County.

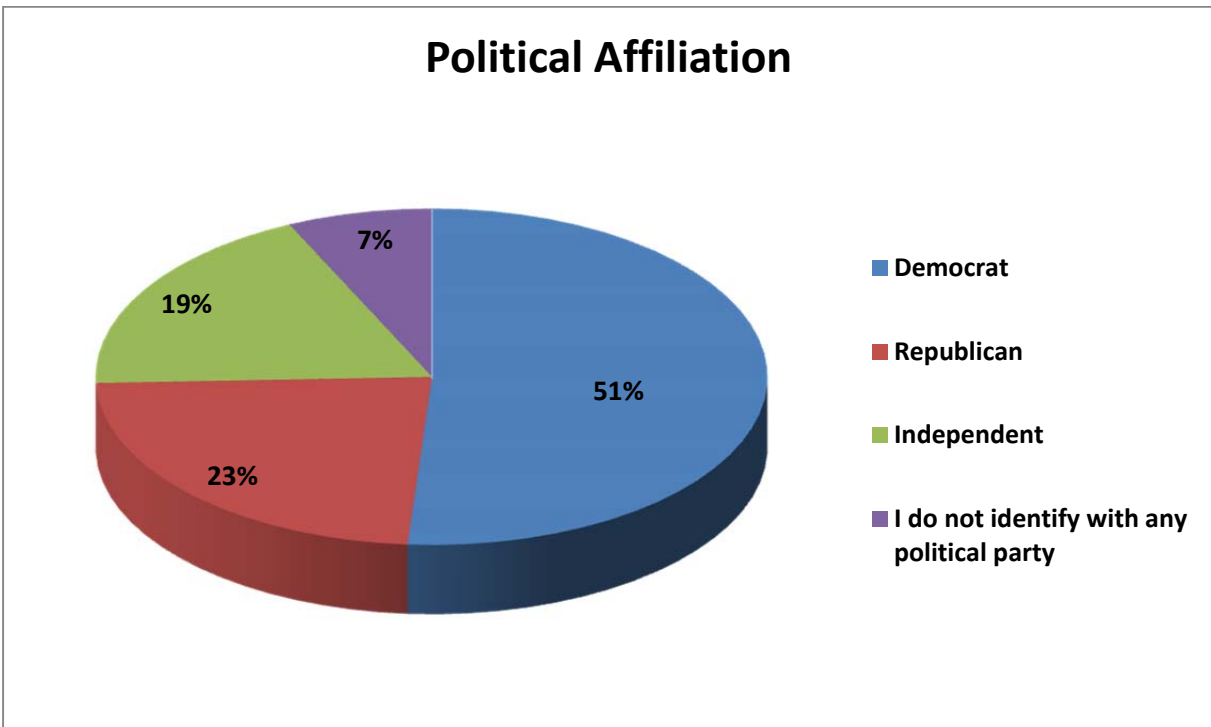


Figure 12. Residents' political affiliations.

Importance Rankings

Respondents were initially asked how they would rank the importance of three sectors of Gates County: economic growth, environmental health, and social welfare. Figure 13 shows that the economy and the environment are valued fairly similarly, with four more people selecting environmental health as the most important sector than economic growth. Social welfare was viewed as considerably less important, with 30 of 44 residents—more than two-thirds—deeming it the least significant.

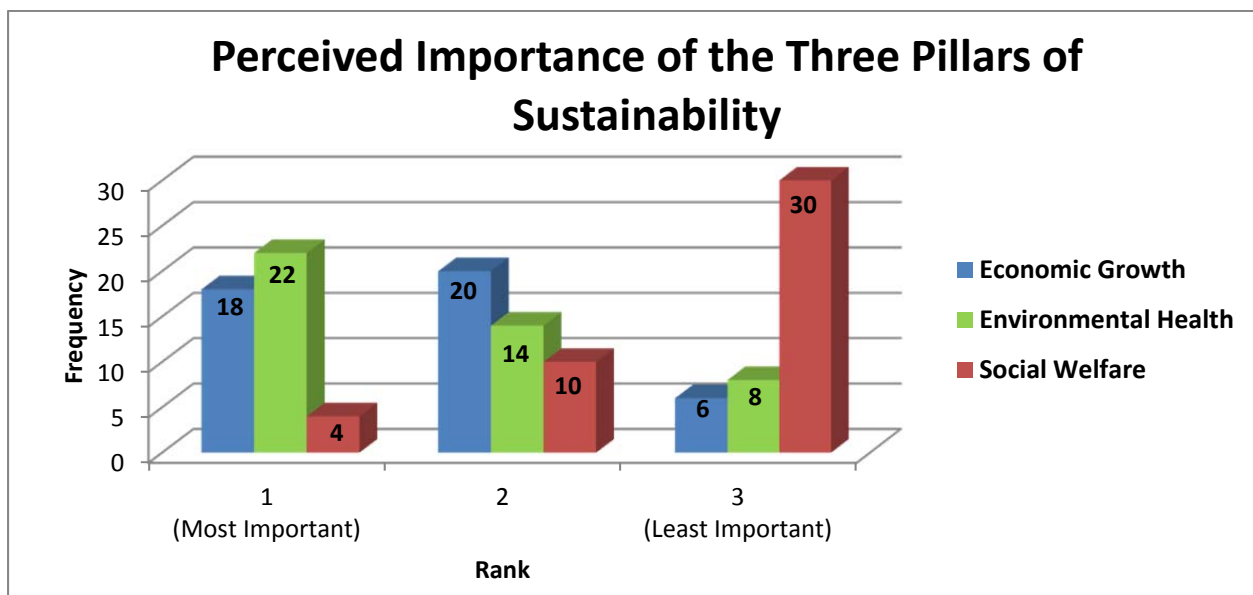


Figure 13. Residents' valuation of the three pillars of sustainability, in order of importance.

Breaking down these sectors further, we find that residents possess very strong values for human health, health of bodies of water, and the lifestyle of Gates County (see Table 1). In fact, of the eight specific sectors listed, human health was chosen as the most important by 21 of the 44 respondents. Of least importance were local businesses, sense of community, and health and diversity of plants and wildlife. It is unclear why residents regard certain aspects of the environment as highly important while dismissing others, but this may play a significant role in generating recommendations for future development.

Table 1. Residents' valuation of various aspects of Gates County. Mean values are on a scale of 1-8, with 1 being least important and 8 being most important. "Top" refers to the number of respondents who selected the corresponding sector as the most important. "Last" refers to the number of respondents who selected the corresponding sector as the least important.

SECTOR	MEAN	TOP	LAST
Human health	5.34	21	1
Way of life / lifestyle	3.82	9	5
Local businesses	2.91	6	10
Agriculture	3.48	4	4
Sense of community	2.84	3	9
Health or rivers, streams, and other bodies of water	4.25	2	2
Natural resources	3.41	2	5
Health and diversity of plants and wildlife	2.81	1	8

When asked to assess the current status of these eight sectors in Gates County, survey takers provided markedly different responses (see Figure 14 for a table comparing importance and current status). With a mean ranking of 6.14 out of 8, agriculture was deemed to be the strongest in the county, with health and diversity of plants and wildlife as the second strongest (5.82). Local businesses (2.94) were rated last, a full 1.57 points below the next weakest sector.

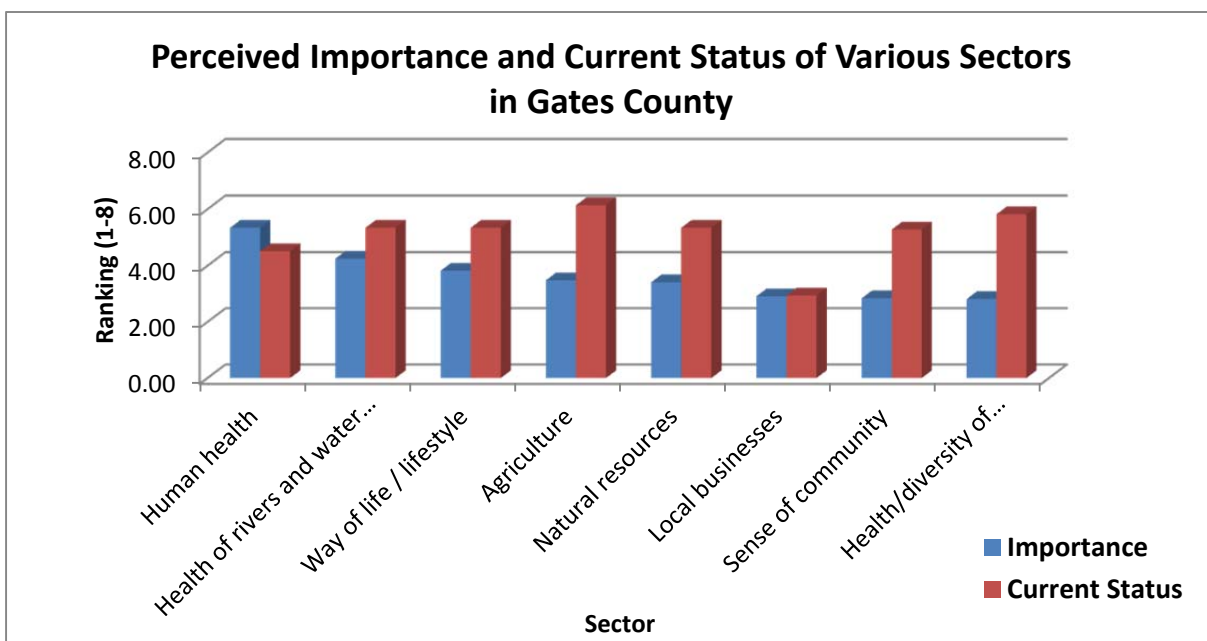


Figure 14. Mean importance rankings of various sectors of Gates County, as listed in Table 1, juxtaposed by residents' assessment of the current status of those same sectors. An assessment of 8 is the highest possible, indicating an extremely strong component of the county.

Views on Sustainable Development

Eighty-six percent of survey respondents claimed they were familiar with “sustainable development,” “green growth,” or “green development.” Seventy percent viewed the concept as at least “somewhat important,” and over half (52%) deemed it “very important” (see Table 2). Only five individuals asserted that sustainable development is unimportant.

Table 2. Residents' perceived importance of sustainable development.

Answer	Response	%
Very Unimportant	3	7%
Somewhat Unimportant	2	5%
Neither Unimportant nor Important	8	18%
Somewhat Important	8	18%
Very Important	23	52%

Respondents were then asked, hypothetically, who they felt should have the most input if Gates County were to create a sustainable development plan. Figure 15 shows that citizen input is regarded very highly, as citizens’ groups and individual citizens were voted as the groups that should have the most and third most input, respectively. Also receiving high marks was local government, which 48% of respondents felt should have “significant input” in creating a sustainable development plan. At the opposite end of the spectrum were consulting firms, state government, and federal government, each of which drew only eight votes for “significant input.” Federal government drew the lowest marks, with 30% of residents believing it should have no input at all in Gates’ plan for sustainability. Interestingly, environmental groups received a mixed response; 41% felt such groups should have significant input, but an additional 11% decided they should have no input at all.

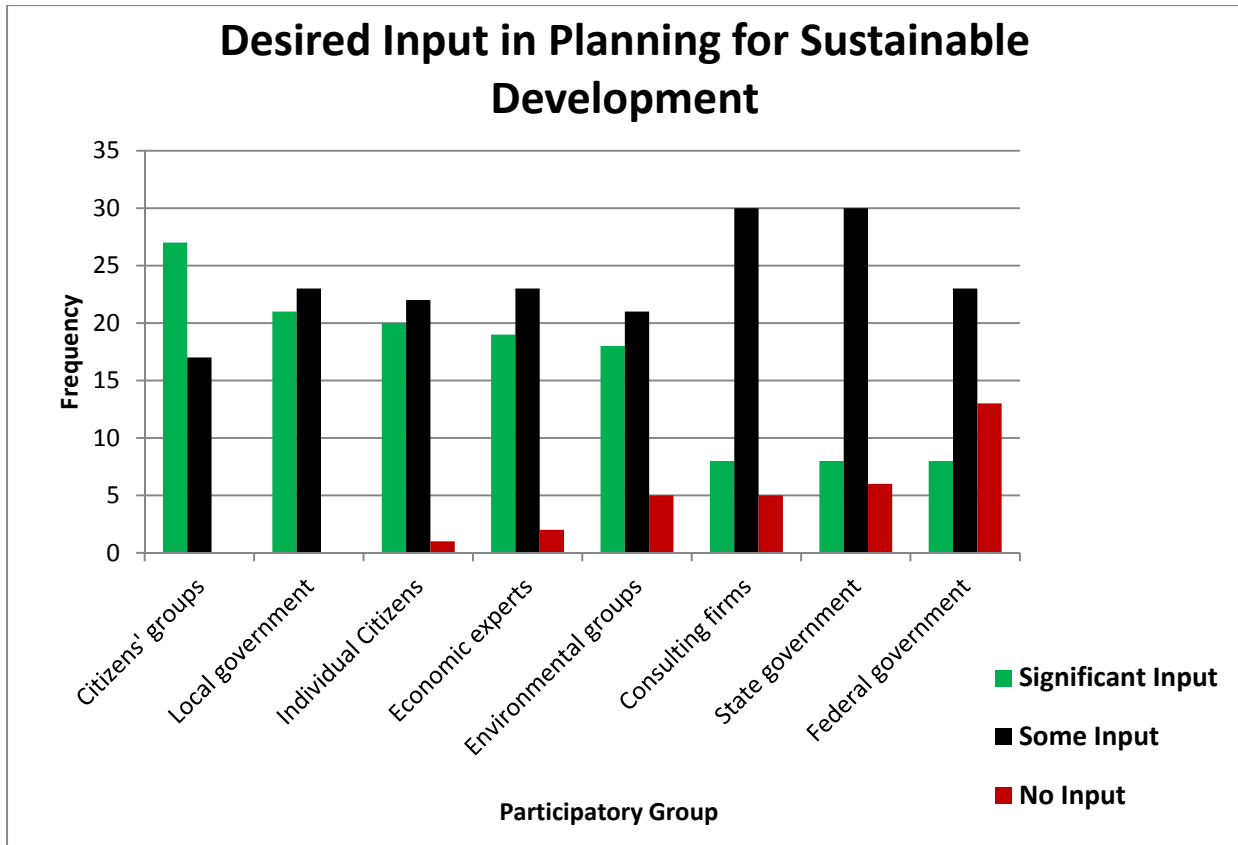


Figure 15. Desired input for various groups in the creation of a sustainable development plan for Gates County.

Potential Improvements: Businesses

Respondents were provided with a list of potential business additions to Gates County and were asked to determine how harmful or beneficial each would be to the county’s overall well-being (see Table 3). In general, local businesses were deemed more beneficial than national chains. For example, independently-owned family restaurants were preferred to chain restaurants, local banks were viewed more favorably than national banks, and a local inn or bed and breakfast was determined to be more beneficial than a national hotel brand. Interestingly, the two businesses viewed as least beneficial were department stores and superstores such as Walmart and Target, despite the convenience they offer. Thirty-four percent of respondents felt a department store would be “somewhat” or “very harmful” to Gates County, while 32% felt the same about a superstore. However, what is perhaps most notable is

that all suggested businesses drew a mean response greater than 3 on a scale of 1 to 5. This signifies that, overall, any reasonable addition to Gates County is viewed as more beneficial than harmful.

One business that would be easy to establish—a farmers’ market—showed especially strong support (see Figure 16), with 93% of surveyed residents saying they would “probably” or “definitely” purchase food from a local farmers’ market if one were established. Only two individuals claimed they would “probably not” utilize such a business, and not a single person said he or she would “definitely not” patronize a farmers’ market.

Potential Improvements: Tourism

Three out of every four residents surveyed believe that increasing tourism would aid the overall well-being of Gates County and its residents. The 33 who responded favorably were then asked to identify which of the region’s current or potential attributes would be most likely to increase tourism. Natural parks, fishing, boating, and waterways were selected as those that would have the greatest effect. Each received a mean rating greater than 3.5 on a scale of 1-4, with 2.5 representing neutrality and 4 representing the highest likelihood of increasing tourism. While all items listed were viewed favorably in their contribution to tourism, those receiving the lowest ratings were regional history museums, bikeways, and hunting.



Figure 16. Gates County residents' likelihood to purchase food from a local farmers' market.

Table 3. Perceived benefits from various potential additions to Gates County.

Possible Addition	Very Harmful	Somewhat Harmful	Neither Harmful nor Beneficial	Somewhat Beneficial	Very Beneficial	Mean
Major grocery store (Food Lion, Kroger, Harris Teeter)	0	2	2	11	29	4.52
Independently-owned family restaurant	0	1	4	16	23	4.39
Local bank	0	0	11	13	20	4.20
Farmers' market	0	3	9	11	21	4.14
Local grocery store or food mart	0	2	12	13	17	4.02
Local inn or bed & breakfast	0	1	12	19	12	3.95
Fast food restaurant (McDonald's, Subway, Taco Bell...)	2	5	3	22	12	3.84
Chain family restaurant (Applebee's, Denny's, Golden Corral...)	2	5	9	15	13	3.73
Independently-owned clothing store	2	2	15	18	7	3.59
Chain convenience store (7-Eleven, Wawa...)	2	9	5	19	9	3.55
National bank (Bank of America, SunTrust, Wachovia...)	0	5	19	13	7	3.50
Chain hotel (Days Inn, Holiday Inn, Marriott)	2	4	15	17	6	3.48
Superstore (Walmart, Target...)	3	11	7	12	11	3.39
Department Store (Macy's, Sears...)	3	12	12	11	6	3.11

Next, the 33 respondents were asked to identify the first and second most important natural features within Gates County. Out of the 31 usable responses, 21 named Merchants Millpond State Park as the most important feature, while an additional four out of 30 cited it as the second most important. Waterways—especially the Chowan River—were mentioned frequently as well, receiving 20 nominations for the second most important feature in addition to three first place votes. In all, Merchants Millpond and waterways were mentioned by 78% and 72% of respondents, respectively. Other suggestions were much less common, but included the Great Dismal Swamp, woodlands, and open space for wildlife.

3.3.2. Interviews

Community Leaders

The information garnered through the citizen surveys was supplemented with information collected in interviews with two Gates County residents: Laura Dickerson from Citizens Against OLF and Reba Green-Holley, Gates County Cooperative Extension Director.

Both Dickerson, a prominent Gates County activist who coordinates many of the outreach efforts opposing the OLF, and Green-Holley, who helps organize various aspects of the “Growing Gates” program, have been active in the new community initiative, which is focused on bringing appropriate, responsible development to the region. According to Dickerson, the initial steps of the program have been dedicated to residents determining what they want Gates County to look like in the future and how to maintain the positive aspects of the county’s identity. Growing Gates has aimed to make citizen participation integral to the planning process and persuade governments and potential funders to support community-generated ideas (L. Dickerson, personal communication, March 18, 2011).

Dickerson explains that there is a strong preference among county residents to keep the region “green” by preserving its natural resources and open spaces and promoting tourism and recreation. Just as they indicated through the surveys, participants in the Growing Gates meetings have identified

natural features as the primary area for economic growth. Citizen recommendations include increasing boat access to the region's waterways, establishing nature trails, and creating more parkland to connect the county's two most prominent sites: Merchants Millpond and the Chowan River (L. Dickerson, personal communication, March 18, 2011).

In addition to promoting Gates County's natural features, residents also desire to increase the prominence of its historical and cultural attributes through agricultural tourism and the creation of a heritage farm (L. Dickerson, personal communication, March 18, 2011). This educational site would serve as a demonstration farm where visitors could learn about the region's history and how agriculture continues to thrive today. Promoting the county's ties to the Civil War is also a priority, including an old fort in the Wine Oak region near the Virginia border (L. Dickerson, personal communication, March 18, 2011).

Residents have also been keen on the idea of increasing the presence of small-scale, local businesses such as restaurants, a visitors' center, and a farmers' market, for which plans have just recently been put in place. At the same time, however, Gates County citizens are desperate for jobs; while they seem to prefer the growth of local businesses, they would welcome almost any type of economic growth (L. Dickerson, personal communication, March 18, 2011). This is supported by the survey responses, which showed support for all of the establishments suggested.

Green-Holley states that a report will be made available to the public once the Growing Gates project is complete, but this will hopefully not mark the end of the initiative (personal communication, February 17, 2011). While the funds remaining from the grant are limited, Green-Holley has applied for supplementary grants to extend the efforts already undertaken (L. Dickerson, personal communication, March 18, 2011). This funding would hopefully complement a formal study of Gates County's historical, cultural, and environmental assets, which would help guide policy decisions in the future.

Survey Respondents

The citizen survey also included a space for comments, which many respondents chose to utilize. Since there was no formal question asked nor was there any way to quantify the responses, the results from this section of the survey are included in the interview section of this report.

Several respondents chose to expand on some of the issues discussed in the survey. These individuals highlighted the underlying need for jobs and an increase in tax revenue. In fact, some argued that the creation of well-paying jobs should trump all else, even if it were to mean bringing factories to the area.

Others, however, expressed concern for the environment and cautioned that any such development be implemented with care. One resident expressed his or her dismay at the overabundance of litter and people's lack of respect for the physical environment, while others hinted at the environmental degradation that often accompanies economic growth, especially if industries are involved. One individual made a case for responsible, mixed-use development.

Although the general consensus was that new businesses were necessary to improve the economic climate of Gates County, multiple respondents expressed pessimism that such businesses would fail, as the county's population is too small—and poor—to support them. One resident was worried that haphazard development would degrade the county's economy even further, noting, "We can ill afford to pursue any development without evidence of real market demand." Another resident proposed a solution, suggesting that the county first focus on attracting outside visitors and then use the revenue generated from tourism for new development.

Finally, the majority of residents who left comments seemed to appreciate the slow-paced lifestyle of Gates County, and many were passionate about maintaining this attribute. One survey taker noted, "I love my peace and [quiet] and will not sacrifice that! ... not now and not in the future ... future generations or not!" At the same time, though, this "peace and quiet" has resulted in significant out-

migration of young adults who must look elsewhere for work. As a result, multiple residents argued that creating opportunities and incentives for people to stay in the county is a necessary step toward sustainability.

4. DISCUSSION & RECOMMENDATIONS

Gates County is fortunate in that it has both a citizen base and a local government that are supportive of sustainable development. As mentioned earlier, residents value economic growth and environmental health fairly equally, and many have passionately advocated for the maintenance of the Gates County lifestyle. These observations are consistent with the finding that 70% of residents deem sustainable development to be important. It is necessary for officials to keep this in mind when considering future plans; reminding residents of the county's ultimate goals will be useful in garnering support for any sustainable development plan. If citizens and government officials recognize that they are both fighting towards the same end, the chances of them crafting and implementing a viable plan are significantly higher than they would otherwise be.

Simply knowing this fact, however, is not enough. A sustainable development plan in Gates County must be carefully crafted and systematically address a variety of components, including businesses, tourism, energy, stormwater management, and land use. Even more important than these individual elements, though, is the overall approach that is taken.

4.1. Businesses

Gates County residents and sustainability experts agree that when it comes to promoting businesses, local is best. Local businesses generally have a smaller environmental footprint, allow money to turn over multiple times within the community, and create jobs that are typically filled by local residents. Promoting local establishments can be done in two ways. First, local government can help subsidize residents looking to start small businesses. Second, residents should be encouraged to

patronize local shops as much as possible. Educating citizens as to how such actions will ultimately benefit them and their community is integral to the success of this endeavor.

The first step toward sustainable growth in Gates County has already been taken. In recent months, plans for a county-wide farmers' market have been laid and the establishment should be open for business—three days per week—in the near future (L. Dickerson, personal communication, March 18, 2011). The presence of this business—especially in an agricultural region—will support local farmers and help money stay within the community.

The farmers' market is a logical first step, but it is important for Gates County not to be too restrictive in focusing on local establishments. Due to their more sizeable and secure economic bases, larger outside companies have a better chance of survival and are better able to weather periods of economic hardship. While these businesses do not typically keep as much money within the community, they do create jobs, increase the tax base, and help grow the local economy. Thus, by allowing larger companies to establish themselves during the early years of sustainable development planning, Gates County can increase revenue that it can then use to help subsidize local businesses in later years. County officials can reduce the risks posed by outside businesses even further by carefully selecting companies that are committed to sustainability and benefitting the local community. Not all large corporations are purely profit-driven; by picking and choosing, officials can help build a local economy that is truly locally-focused.

4.2. Tourism

Another way in which Gates County can increase its economic base while still preserving its environmental and cultural attributes is through tourism. Survey results indicate strong support for the promotion of tourist activity, with 75% of residents deeming it beneficial, and it is a great way to improve the local economy with outside funding. When determining what locations and endeavors should be promoted, officials should consult heavily with residents, as they are the ones who are most

aware of the county's attributes. As a result, officials should heed residents' advice and focus on activities such as fishing, boating, and the exploration of waterways and unique areas such as Merchants Millpond State Park and the Chowan River.

Merchants Millpond has already received significant attention in recent years in the form of a brand new, multimillion-dollar visitors' center. In addition to serving as an educational and tourist center for park visitors, the complex is LEED certified (Staff Reports, 2009). This visible commitment to sustainability should not be taken lightly and can be used to educate visitors about sustainable development. Meanwhile, no development has been planned for the Chowan River and other waterways, but local citizens have suggested increasing boat access, which would benefit both tourists and residents alike while requiring a relatively minimal investment.

Any increase in tourism would lend itself nicely to the establishment of places to stay, such as small inns and bed and breakfasts. Such accommodations, unlike large-scale hotels, would be locally-owned and appropriately sized, and would fit in well with the region's rural atmosphere. In this sense, tourism could lead to additional growth. As one resident said, "If we can get enough people to come to Gates for something to cause some traffic problems, we may have some hopes for that hotel down the road." In other words, tourism could serve as a catalyst for more pronounced sustainable growth in the future.

4.3. Energy

Gates County should follow the lead of communities such as Greensburg and Samsø Island and make a concerted effort to transition to more environmentally benign energy sources. Complete energy independence might not be feasible for Gates in the immediate future, but that should not prevent officials from prioritizing renewable energy such as wind and solar.

4.3.1. Wind Power

Gates County may not be subject to the intense winds that generate power offshore, along mountain ridges, and in the American Midwest, but it is nonetheless located in a suitable area for wind power generation. The county's flat topography and proximity to open water allow it to experience winds that are stronger than those felt throughout most of the country (Onboard Informatics, 2010) (see Figure 17). The abundance of open land makes the region even more suitable for wind power generation. With improved technological efficiency, it is even possible that wind power could become an economically viable export that could be sold to nearby jurisdictions. Even if this does not occur, though, the savings experienced by residents and businesses could make up for the initial investment.

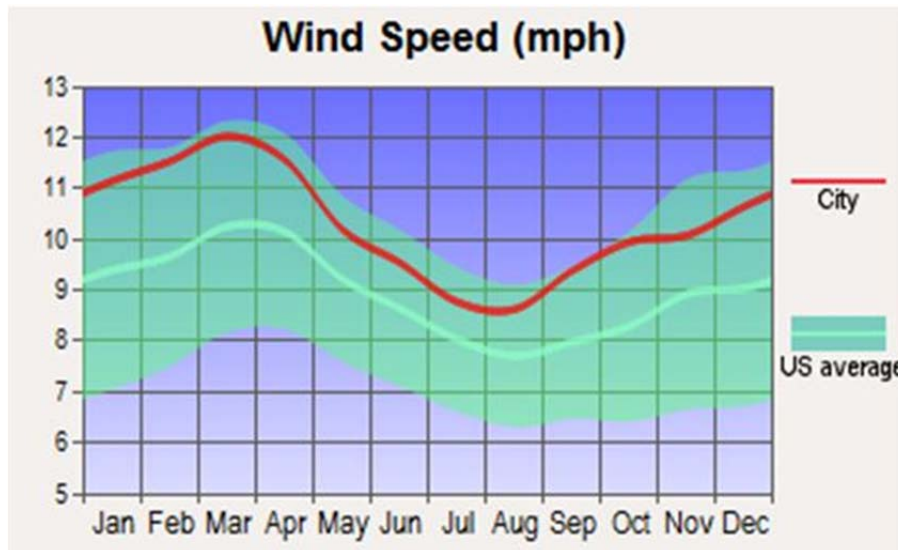


Figure 17. Average wind speeds in Gatesville, Gates County, compared with the national average. (Image Credit: www.city-data.com)

In addition, landowners could potentially earn income from leasing portions of their land to power companies for turbine construction. Since turbines are tall and do not interfere significantly with farming or grazing, they can allow property owners to turn a profit, a practice that is becoming increasingly popular in the American Midwest (Romm, 2008). Even if large-scale wind projects are not

pursued, individual households can still benefit by erecting small wind turbines and coupling them with diesel generators or batteries for personal use without connection to the utility grid (Pew Center). Finally, Gates County may have the option to purchase wind energy from other areas in North Carolina in the future, as the development of offshore wind farms is often discussed within coastal states.

4.3.2. Solar Power

In addition to wind energy, Gates County also has the potential to harness solar power. With an average frequency of sunshine greater than 50% throughout the year (see Figure 18) and a lack of topography that would restrict sun exposure, opportunities exist for both large- and small-scale development. Just as with wind power, small-scale solar structures can be coupled with remote power sources to use electricity off the grid.

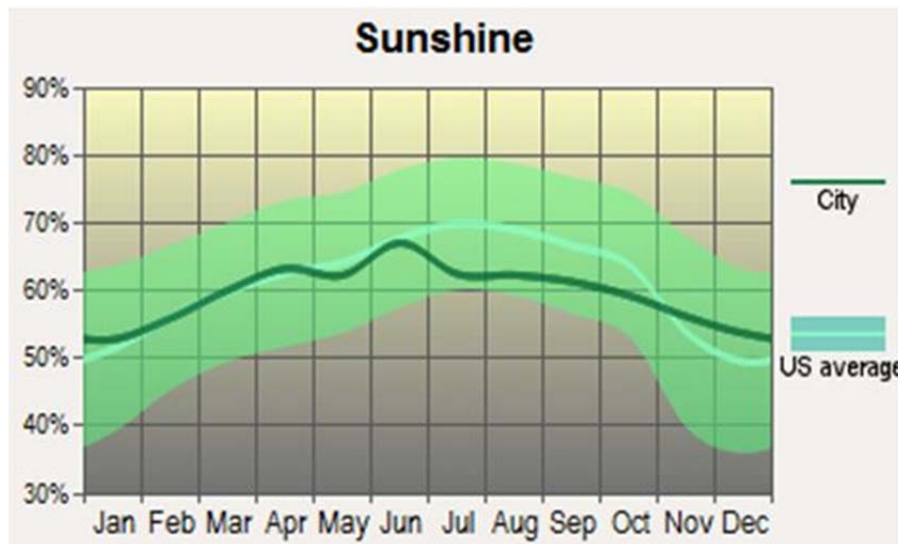


Figure 18. Average amount of sunshine in Gatesville, Gates County, compared with the national average. (Image Credit: www.city-data.com)

Gates residents can also harness the power of the sun in a much simpler way through passive solar design. New buildings can be designed to maximize northern exposures and minimize southern exposures, allowing for more sunlight to enter during the cold winter months and less during the

summer. For more ambitious architects and homeowners, additional structures can be built to ensure more control over the amount of heat being reradiated throughout the house, and systems can even be implemented that provide water heating capabilities.

4.3.3. Other Forms of Renewable Energy

Although other sources of renewable energy exist, they do not appear to be suitable for Gates County. For example, geothermal power is most viable in areas underlain by tectonic or volcanic activity, and hydropower would require the construction of a dam. While Gates County does have access to a significant waterway in the form of the Chowan River, dam construction and operation are associated with myriad environmental harms that would make such a project impractical.

4.4. Stormwater Management

In a sense, Gates County is already well-equipped to manage stormwater runoff. Due to the low population density and lack of infrastructure, many principles of Low Impact Development are already in place. The narrow roads, lack of curbs and gutters, and prevalence of vegetation help prevent runoff from being accelerated into streams and rivers. This allows for a more natural flood profile—as opposed to the abrupt peaks often seen in urban areas—and keeps erosion at a manageable level. By preventing the acceleration of runoff, this design also allows time for stormwater to pass through vegetated areas, which serve as natural filters to remove pollutants. If additional development does occur in the county, planners should make sure to incorporate LID into their site plans.

However, stormwater runoff will still make its way into streams and rivers eventually and, after flowing through farmland laden with fertilizers and pesticides, can be ecologically damaging. The problem of nonpoint source pollution is widespread in agricultural regions, and Gates County is no exception. As a form of mitigation, farmers who have not done so already should be persuaded or required to plant buffer vegetation along drainage areas, creeks, and streams to provide an additional

layer of filtration. This task could be subsidized by the local government or carried out with the help of environmental nonprofit organizations.

4.5. Land Use

Many people might think that land use regulations would not be necessary in such a rural region, but in actuality, Gates County does not have a large amount of land preserved as natural habitat. In addition to fighting for further land preservation in the form of parks and game lands, county officials should seek to prioritize infill development. By developing within areas that have already lost much of their rural nature, sprawl—and the habitat destruction that results from it—can be avoided.

4.6. Approach

While residents and officials should not overlook any aspect of sustainable development, the one that is perhaps most integral to a project's viability is the overall approach that is taken. Case studies have shown that community involvement in collaboration with local government is crucial to success. Not only is citizen participation a common factor in successful sustainable communities, but it is also something directly identified by Gates County residents as being extremely important.

Education is equally vital. In order to encourage and ensure participation in the planning and implementation processes, citizens must understand the importance of sustainable development and accept the fact that a higher initial investment might be necessary to receive larger benefits in the future. Communication must be prioritized in order to make sure all residents are cognizant of the county's goals, plans, and desire for citizen input. In addition, children should be encouraged to learn about the county's plan for sustainable development, since any such project will span many decades and require the support of the next generation as well.

Since the beginning of this project, there have been a number of positive signs with respect to community participation, interaction, and education, most notably through the Growing Gates program.

Gates County should continue to capitalize on its tight-knit community, hold open discussions, and make sustainable development a community-wide effort. The more citizen participation there is, the more politically feasible a sustainable development plan will be, since officials know they have the support of their constituents.

Residents and officials should also look to other communities for ideas and evidence of what works. There are a number of sustainable rural communities worldwide and each can offer lessons to communities that are attempting to follow suit. One commonality of all successful projects is that they are flexible and adaptable to changing circumstances, including environmental and financial constraints. Since the world is undergoing constant shifts, flexibility is necessary to maintain a balance between economics, environment, and society.

5. LIMITATIONS

The above recommendations provide the basis for a sustainable development plan in Gates County. However, while county officials and residents should remain optimistic and focused on achieving their sustainability goals, it would be naïve to ignore the potential challenges they will face along the way.

Perhaps the most problematic obstacles are those relating to financial constraints. As mentioned earlier, Gates County is not a wealthy jurisdiction; while incorporating sustainability into future growth plans would likely lead to long-term economic success, the initial costs of certain projects might be prohibitive. However, even without much initial capital, other towns such as Samsø have been able to afford these costs, largely through creativity, determination, and outside funding. As a result, Gates County officials should exhaust all options in pursuit of funding, including public and private grants, government subsidies and tax breaks, and assistance from nonprofit organizations.

As many are aware, politics can pose an additional hurdle, especially in the United States. While the Gates County government is largely supportive of the concept of green growth, it still must balance any development with the myriad other projects and services it oversees. Furthermore, there may be less support at the state or national levels, as various rules, regulations, and costs could cast the project in a negative light for those who will not benefit directly from its implementation. The best way for citizens to address this potential roadblock is through activism. Politicians typically cater to the demands of their constituents; by expressing their support for sustainable development and demanding that it be prioritized, Gates County residents will have a better chance of overcoming this barrier.

Finally, as with nearly all types of development, there is the risk of the “Not In My Backyard” (NIMBY) phenomenon causing societal strife. It is often the case that residents are supportive of a plan for development on the condition that it does not affect their property or immediate surroundings. Most of the recommendations outlined for Gates County are non-intrusive and are designed to be a welcomed addition to any part of the county, but others—including the construction of new businesses and infrastructure for renewable energy—might be met with resistance by those residents in closest proximity to the affected areas. Nonetheless, land resources are fairly plentiful in Gates County and citizens are generally environmentally-minded, so NIMBYism is not likely to pose as much of a problem as it does in other areas.

6. CONCLUSIONS

Gates County is presented with a unique opportunity to plan for and implement sustainable development. Economic growth has been identified as a priority, natural and societal resources remain vibrant, and concern over the proposed OLF has united residents and government officials alike. All of these factors have produced a climate amenable to sustainable development. Furthermore, the rural

nature of Gates County actually makes green growth more feasible, as land constraints and existing infrastructure do not pose the same challenges that they do in more heavily developed regions.

The preceding sections have identified important components of a sustainable development plan, reviewed case studies of communities similar to Gates County, and assessed residents' views on the current state of their county and how they would like to see it improve. At the same time, however, it must be noted that this study is not—nor is it intended to be—all-inclusive. Numerous dimensions of sustainable development—including waste management, transportation, and personal consumption—were left unaddressed in order to highlight those that are less common and perhaps less obvious.

It is important for Gates County officials and residents not to be overwhelmed by the comprehensiveness of green growth; instead, they should view it as an opportunity, one that gives them a variety of options for how they can pursue their goals for economic growth, environmental health, and societal well-being. A successful sustainable development plan necessitates a holistic approach, but that does not mean that all components must be addressed simultaneously. By crafting a detailed, methodical plan, citizens and officials can make sustainability a viable goal over the coming years and decades.

Finally, the potential benefits resulting from a sustainable development plan in Gates County are not limited to the locality itself. Just as Greensburg and Samsø serve as valuable lessons for other communities looking to implement plans for green growth, so too can Gates County. Greensburg's Sustainable Comprehensive Plan notes that the town's "progressive goals for rebuilding also represent an opportunity for other rural towns to better understand how a successful, sustainable economy is created. The planning team has heard from the community that it is important to make replicable decisions in Greensburg so successes can be shared with similar communities" (BNIM Architects, 2008, p. 13). Creating and implementing a sustainable development plan will undoubtedly benefit current and

future residents of Gates County, but by encouraging others to do the same, it can also lead to the type of large-scale change that is needed to combat the global threats faced by all societies.

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9. APPENDIX

9.1. Appendix A: Survey Instrument

INTRODUCTION

Dear Gates County Resident,

Thank you for taking the time to complete this survey. Your feedback is extremely valuable and your responses will be used to better understand citizens' views on future development in the county.

You will not be asked to provide your name or address. Please note that while your responses may be shared with those involved in the future development of Gates County and/or be included in a master's project report, no one will be able to connect your answers with who you are. At the end of the survey, you will have the option to enter your e-mail address or phone number to enter a random drawing for an American Express gift card. However, this information will ONLY be used to contact you if you are a winner. It will be stripped from the rest of the data.

By continuing with the survey, you certify that you are at least 18 years of age. If for any reason you decide not to complete the survey, you may exit at any time. Finally, this is an independent survey; it is not affiliated with the government of Gates County.

This survey should take approximately 10 minutes to complete.

*Sincerely,
Brian Cohen
Master's Degree Candidate, Duke University*

BACKGROUND INFORMATION

Please read the following background information on Gates County, North Carolina.

The Sandbanks, an area in eastern Gates County along the Chowan River, was identified several years ago by the United States Navy as a potential location for a new Outlying Landing Field (OLF). Viewing the proposal as a threat to the county's environmental, cultural, and social well-being, many residents launched an organized fight, pledging to preserve the county's history and sense of community. In January 2011, the fears of many residents were eased when the Navy announced it would delay its plans for a new OLF until at least 2014.

Whether or not Gates County remains on the Navy's list of potential sites, the issue has spurred discussion about future development in the region. Gates is a county steeped in history, culture, and environmental resources, but one that could also benefit from economic development that can improve the quality of life for all residents.

The county has benefited from a grant awarded by North Carolina State University that provided funds for the recently held "Growing Gates" workshop. The workshop allowed citizens, government officials, and representatives from the NC State School of Design to discuss openly the potential for economic development and the best ways in which to do so.

Gates County is presented with a unique opportunity in that the views of residents will have a significant impact on how development proceeds.

RANKINGS

Q: Please rank the following in order of importance, with 1 being the most important and 3 being the least important.

- Economic growth
- Environmental health
- Social welfare

Q: Please rank the following sectors in order of importance for Gates County, NC, with 1 being the most important and 8 being the least important.

- Agriculture
- Health and diversity of plants and wildlife
- Health of rivers, streams, and other bodies of water
- Human health
- Local businesses
- Natural resources
- Sense of community
- Way of life / lifestyle

Q: Please rate the current status of each of these sectors in Gates County, NC, ranging from very poor to very strong.

	Very Poor	Somewhat Poor	Average	Somewhat Strong	Very Strong
Agriculture	○	○	○	○	○
Health and diversity of plants and wildlife	○	○	○	○	○
Health of rivers, streams, and other bodies of water	○	○	○	○	○
Human health	○	○	○	○	○
Local businesses	○	○	○	○	○
Natural resources	○	○	○	○	○
Sense of community	○	○	○	○	○
Way of life / lifestyle	○	○	○	○	○

Q: Are you familiar with one or more of the following terms?

Sustainable Development

Green Growth

Green Development

Yes

No

SUSTAINABLE DEVELOPMENT

Sustainable Development / Green Growth

“Sustainable development,” also referred to as “green growth” or “green development,” is often defined as meeting the needs of the present without compromising the ability of future generation to meet their own needs.

Planning for sustainable development entails extra care and consideration, and oftentimes requires citizens to make some sacrifices today to ensure that they and their children will be able to enjoy a similar quality of life in the future. Sustainable development is becoming a major focus among many government officials, developers, and other groups as they recognize the limits of our planet.

Q: In general, how important do you feel the issue of sustainable development is?

Very Unimportant	Somewhat Unimportant	Neither Unimportant nor Important	Somewhat Important	Very Important
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q: If Gates County were to develop a plan for sustainable development, how much input should each of the following entities have in the process?

	No Input	Some Input	Significant Input
Citizens' groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consulting firms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic experts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual citizens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Federal government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

BUSINESSES

Q: For each of the following businesses, please select how harmful or beneficial its addition would be for the overall well-being of Gates County.

	Very Harmful	Somewhat Harmful	Neither Harmful nor Beneficial	Somewhat Beneficial	Very Beneficial
National bank (Bank of America, SunTrust, Wachovia...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fast food restaurant (McDonald's, Subway, Taco Bell...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chain family restaurant (Applebee's, Denny's, Golden Corral...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Independently-owned family restaurant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chain hotel (Days Inn, Holiday Inn, Marriott...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local inn or bed & breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Major grocery store (Food Lion, Kroger, Harris Teeter...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local grocery store or food mart	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chain convenience store (7-Eleven, Wawa...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farmers' market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Superstore (Walmart, Target...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Department store (Macy's, Sears...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Independently-owned clothing store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q: Would you purchase food from a local farmers' market, if one were established in Gates County?

Definitely Not	Probably Not	Not Sure	Probably Yes	Definitely Yes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q: Do you believe increasing tourism in Gates County would be beneficial to the overall well-being of the region and its residents?

- Yes
- No

Q: How likely or unlikely would the following attractions (either currently in existence or potential additions) be to increase tourism in the region?

	Very Unlikely	Somewhat Unlikely	Somewhat Likely	Very Likely
Bikeways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fishing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hiking trails	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Historic sites (Century farms, cemeteries, historic buildings...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hunting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Museums honoring the history of the region	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural parks (such as Merchants Millpond State Park)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waterways (such as the Chowan River)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q: In your opinion, what are the two most important natural features in Gates County that should be protected in order to promote tourism?

Most important natural feature

Second most important natural feature

ADDITIONAL INFORMATION

Q: Please enter your 5-digit zip code.

Q: What is your age?

- 18-27
- 28-37
- 38-47
- 48-57
- 58-67
- 68 or older

Q: What is your gender?

- Male
- Female

Q: How long have you lived in Gates County, NC?

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-20 years
- More than 20 years

Q: Please select the choice that best represents your relationship status.

- Unmarried
- Married
- Divorced/Separated or Widowed

Q: How many children do you have?

Q: Did your children spend some or all of their childhood in Gates County, NC?
(for respondents with children)

- Yes
- No

Q: What is your political affiliation?

- Democrat
 - Republican
 - Independent
 - Other (please describe)
 - I do not identify with any political party
-

COMMENTS

Q: If you have any additional comments, please write them below.

DRAWING

Thank you for completing the survey!

If you would like to be entered into the random drawing for an American Express gift card, please provide your e-mail address or phone number below. This information will ONLY be used to contact you in the event that you are selected as a winner; it will not be shared with any other party.

9.2. Appendix B: Recruitment Postcard



(front)



(back)