Greenville County Greenbelt and Unintended Externalities
A glimpse at affected poverty levels, income levels, and Hispanic minorities

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Abstract

As cities expand, the space for agriculture, parks, and outdoor recreation is shrinking. Jane Jacobs' research concerning the remodeling of American cities was avant-garde for 1961, but her pressure towards a paradigm shift in the utility of cities has led to a more encompassing discussion. The foundation of this project begins with the Greenbelt Feasibility Study, which measures the prospect of an agricultural greenbelt along the outskirts of cities by using Greenville, South Carolina as the case study. During the foundational greenbelt assessment process, a computerized map to aid in land use designation was created for Greenville County, South Carolina. Multi-criteria Decision Analysis (MCDA) was utilized with the support of Geographic Information Systems primarily to explore the feasibility of an agricultural greenbelt, while secondarily seeking green space where there is a lack of agricultural capacity. The feasibility of creating the greenbelt was comprised of four distinctive variables that make up a Synthesis of Environmental Parameters (SEP) along with a property parcel layer. Designated green space and agriculture provide food and space amenities for large urban areas while also easing urban sprawl. Despite the amenities offered to the inhabitants of greenbelt cities, there is undoubtedly a list of unintended externalities that manifest as a result of the greenbelts presence, such as increased commuting costs, changes in property values, and gentrification. Externalities refer to any type unintended developments that negatively affect people. The purpose of this study is to use the Synthesis of Environmental Parameters and parcel data as an outline for a potential greenbelt, and expand beyond the feasibility to examine how the introduction and implementation of a greenbelt would affect those of low-income, below the poverty line, as well as the Hispanic population of Greenville County. I chose to look at the Hispanic population because of their prominence in the northwestern area as well as their correlation with low income. Further, I think it is important to not only know economic groups who could be affected by the greenbelt, but minority groups as well. By using US Census data from the National Historical Geographic Information System (NHGIS), the study was able to encompass several parameters involving income as well as minority grouping to assess how a greenbelt could negatively affect marginalized groups throughout the county.

Introduction / Lit Review

Agriculture has been a part of humanity's fabric as a means to survive since the cultivation and domestication of land was first introduced in the city Jericho nearly 10,000 years ago. Jericho was a small town nestled by the Jordan River in the West Bank of Israel, thus making it ideal for a sedentary lifestyle influenced largely by the population's ability to grow wheat and later barley. Jericho was one of the first towns to realize that "land is one of the most valuable natural resources, and it needs to be harnessed according to its potential" (Ceccarelli et al 2014). Jericho is important because the agricultural society began during its genesis is something American society has lost, and so we are know striving to recover it through farm to table and urban gardens. Over the course of the past two centuries, humanity's ability to manipulate nature for our own needs has been focused, and as a result the world today is a vastly different place than it was two-hundred years ago. Through the meatpacking industry of Chicago, introduction of genetically modified organisms, and even the invention of the car, communities have lost their identity and purpose behind agriculture. The visible effect the driving forces such as accessibility, urbanization, globalization, and the impact of calamities, has drastically changed the formation, use, and ideology behind land use and agriculture (Antrop 2005). As a result of the mismanagement of agriculture and land use, there must eventually be a reaction to land transformation manipulation, thus genesis of the greenbelt is introduced. This study is not concerned with the feasibility of the greenbelt, but rather the implementation of such and how its inception would affect communities of lower socio-economic stature. Minority groups and those of lower socio-economic standing would be subject to higher social costs of the greenbelt such as commuting costs if displaced by gentrification. From the Bae case study of the Seoul Greenbelt "…work-trip distance changes between the 'with Greenbelt' and 'without Greenbelt', [and further] commuting distance savings of workers who live inside of the greenbelt range from 25-35 percent savings" (Bae et al 2000). Further those unable to afford living inside of the city are forced to encounter variably high commuting costs for undeniably lower wage jobs. Also, "an increase in legally-permitted density will probably increase the value of a property if its market density is higher than the permitted density… [and] cluster developments will produce higher home values…" (Asabere 2012). From case studies done both in North America and Asia, the list of unintended negative externalities has continued to augment, and awareness around the these externalities is gaining notice. In conclusion, while the greenbelt is well thought of in terms of creating agriculture and green space for local communities "…the current government [of Canada] has not engaged in redistributive strategies to address the income and public expenditure gaps between the inner city and the exurbs, and it has lagged behind its ambitious implication strategy" (Keil & Macdonald 2012), thus proving the fallacies in other greenbelt systems. This research is a case study of Greenville County, South Carolina aimed towards examining a greenbelt's implementation affect upon those in lower socio-economic position.
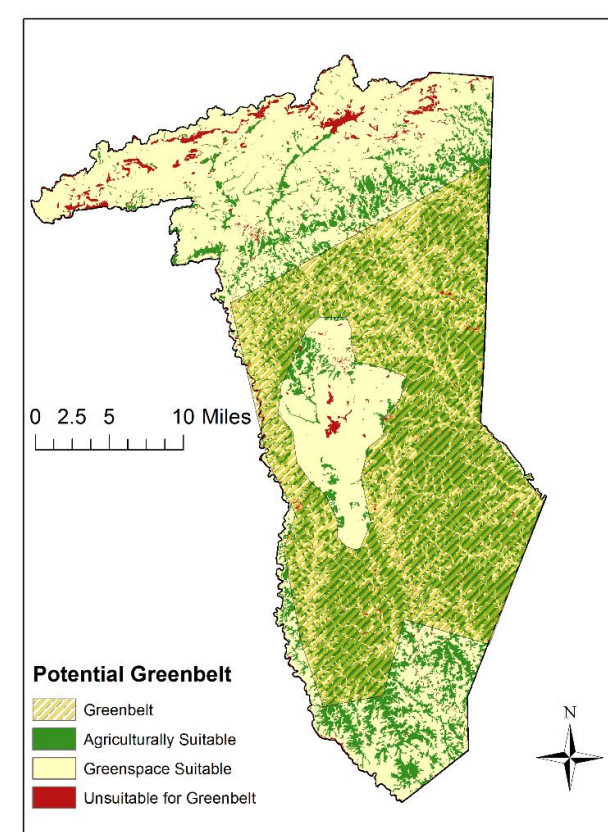

Figure 1: This map highlights the potential greenbelt in tandem with the different greenbelt designations. This Map is important towards visualizing what areas of the county would be affected by implementation of a greenbelt. Green space suitable refers to land that could be used for parks, forests, and other recreational purposes.
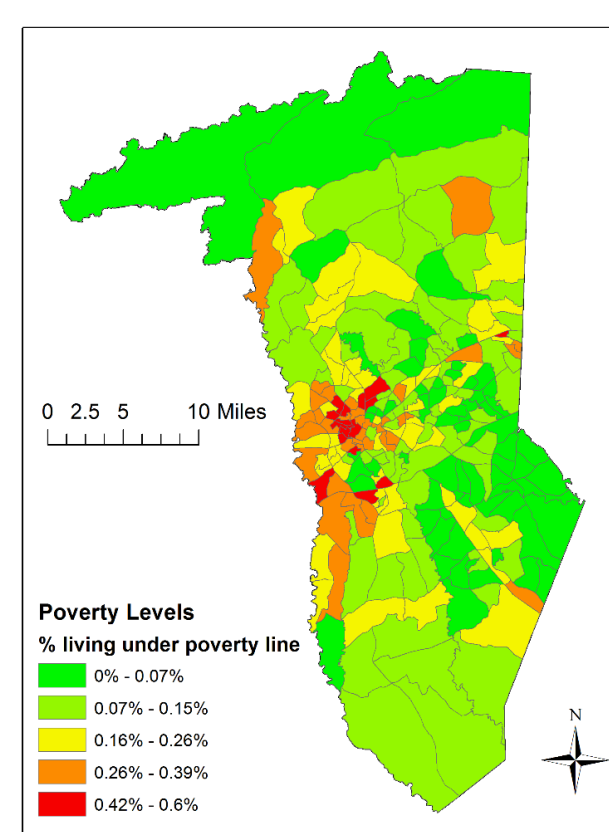

Figure 2: By using Natural Breaks, this map highlights those areas, particularly on the western side of the county that are particularly vulnerable because of poverty levels being so high. This map shows the possible reason to expand the greenbelt beyond only Greenville county.
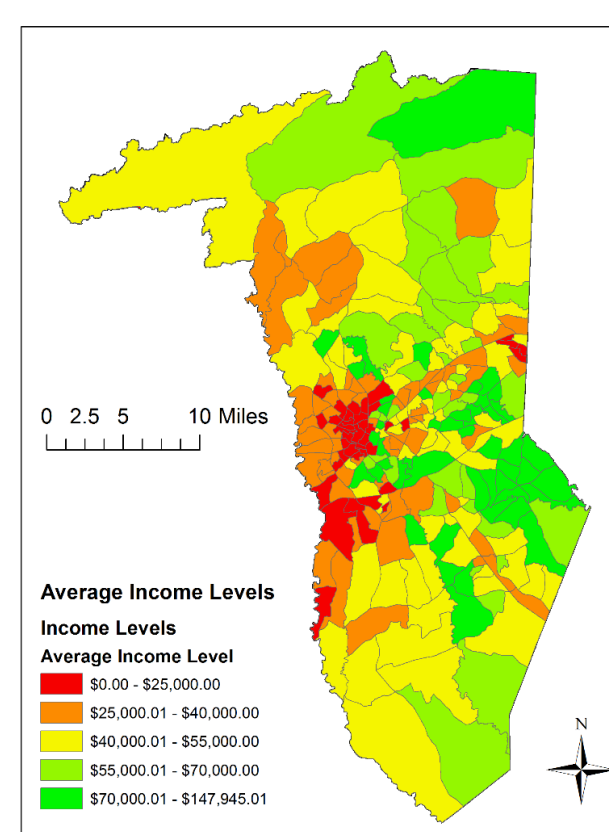

Figure 3: Map three again reveals the middle western side of the county as lower income, thus giving greater momentum to the notion that a lot of these communities may be forced to leave as a function of gentrification and competition for land.

III. Methodology

The project began with assessing the areas in Greenville County, SC with qualities feasible for a greenbelt with emphasis on agriculture, and in order to assess the parcels of land there were four primary variables used: agricultural soil index, hydrologic soil levels, land cover type, and slope gradient. Each of the variables were evaluated in Geographic Information Systems (GIS) by compiling them under the umbrella of a GIS tool called 'Weighted Overlay' where the variables were ascribed various weight pertaining to their importance in the creation of the greenbelt. The weight (%) of each variable are: agricultural soil index (30%), hydrologic soil rating (30%), land cover type (25%), and slope (15%). All of these variables were used to create a feasibility map for a greenbelt in Greenville County.

Once the areas of greenbelt feasibility were mapped, collection of block group data (https://data2.nhgis.org/main) concerning income and poverty levels were collected in tandem with percentage of individuals of Hispanic or Latino descent. Each of these data sets were used in ArcMap in order to reveal trends concerning where those block group areas of lower income and high percentage poverty, and whether or not they would be displaced as a result of the greenbelt. Further, those who identified themselves as of Hispanic or Latino descent were also mapped by block group to see whether that particular minority group would be displaced as a function of the greenbelt's existence. The purpose of a greenbelt in a city is admirable and insightful, but its integration creates a new socio-economic climate for inhabitants to live in. This project is a concise look at how these different dynamics interact.

IV. Results and Discussion

My intent in conducting this study is to discover those areas of Greenville County that could be most impacted socio-economically by the introduction and implementation of a greenbelt. A greenbelt would certainly provide the Greenville County community with green space accessibility, local agriculture, a compact growth system, and also would attract the attention of new businesses and residents. The economic implications towards boosting the local GDP could be tremendous, exempli gratia, "the rate of growth in the Korean economy was the second highest in the world from 1965-99 after Botswana" (Kwon & Song 1991). The economic climate would induce a greater synthesis of ideas and business because everything would have to be more concentrated within the city. Copenhagen for example is a city where spatial growth was not an option as a result of a greenbelt, so growth in technology, social systems, connectivity, among other factors would be forced to grow in some form to compensate for lack of spatial development.

Despite the positive implications a greenbelt could potentially have upon a city, the implementation of such a great visual and socio-economic boundary could also serve as a barrier to entry for many people. The average income in Greenville according to the U.S. Census Bureau is $42,674 and 52.58% of the population falls below the average. 49% of the population average an annual income of less than $25,000, thus implying a lack of resources for those groups that fall under $25,000 annually. While populations of lesser socio-economic do have access to public transportation, will those people still have buses running routes outside of the greenbelt into rural areas? Of the total number of block groups in Greenville County, there were 76 block groups that possess at least 20% of their population live under the poverty line. 26.1% of the block groups in Greenville are vulnerable towards the implementation of the greenbelt, which is a major concern seeing as how most of these block groups exist within the inside of the proposed greenbelt. If property prices increase as a result of the greenbelt, then gentrification would most likely occur. Lastly, 11.34% of block groups in Greenville County possess a population greater than 20% of the total that are of Hispanic or Latino descent. The majority of these block groups are located in the same western area of the inside portion of the greenbelt, thus making this population vulnerable as well. Correlation does not mean causation; however, the synthesis of vulnerable populations being in areas of a future greenbelt does present concerning hurdles.

The synthesis of these three socio-economic parameters reveal that those groups falling into these various categories could potentially be affected by the implementation of a greenbelt through the way the greenbelt would affect interior city housing and living costs. In conclusion, if these populations were forced to move outside of the city, commuting costs for those populations would increase greatly and their jobs' wages would not necessarily change. Another factor to be considered is the unintended genesis of a satellite community outside of the greenbelt, which would in some ways negate the greenbelt.
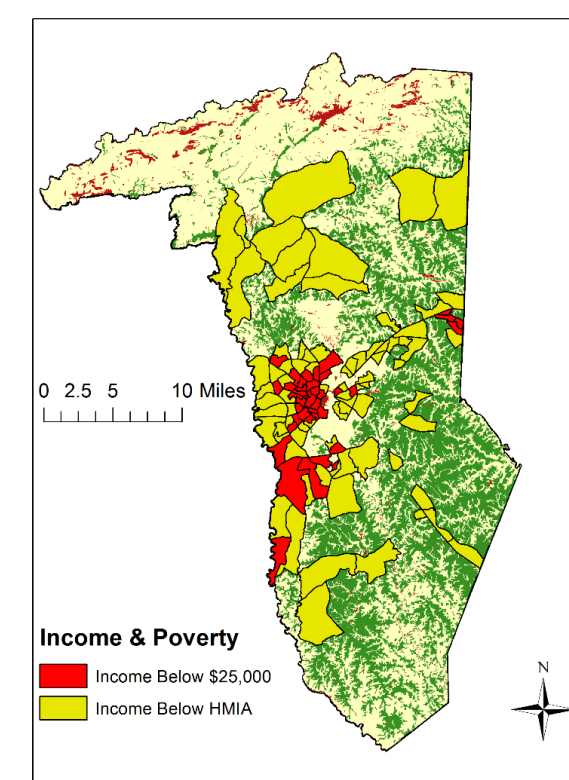

Figure 4: HMIA stands for housing median income average, which came from CSA block group data. The poverty and income maps were synthesized on this map to show exactly the lower income areas that would be struck by the market demand created by a greenbelt.
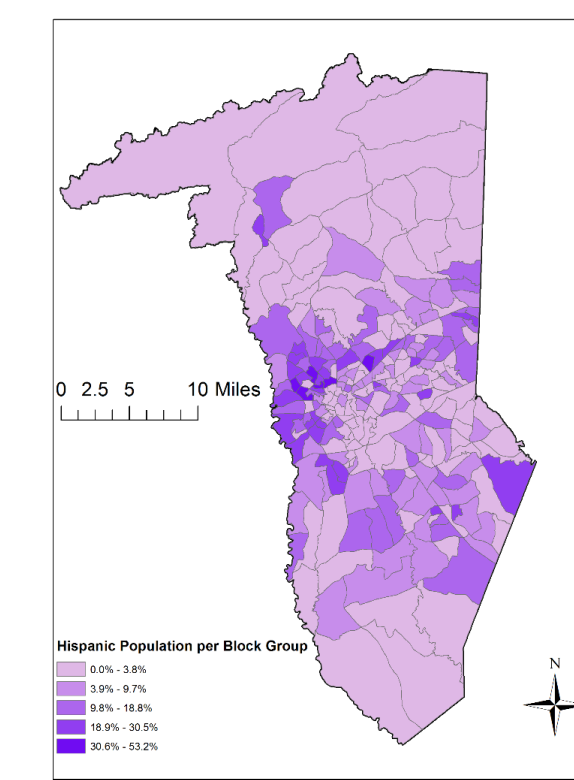

Figure 5: This map simply highlights the areas of the county with high concentrations of people of Hispanic or Latino descent. Again we see the western middle of the county highlighted.
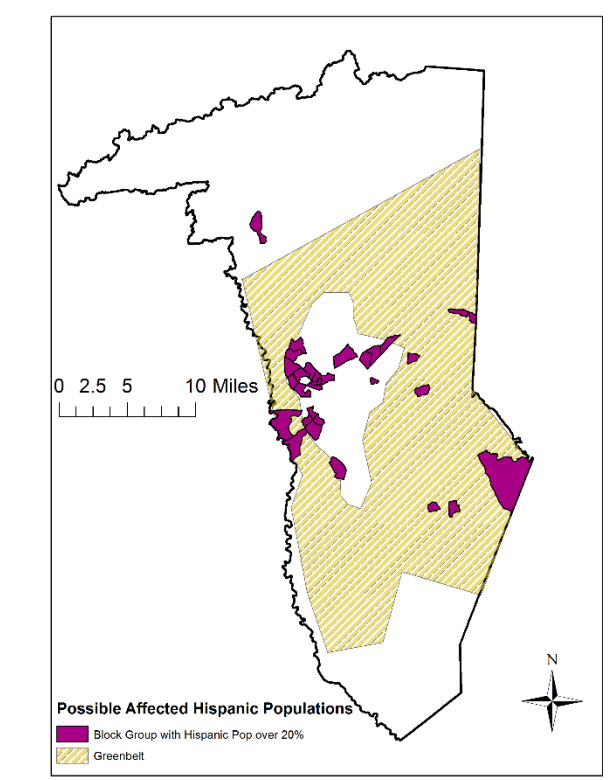

Figure 6: The last map just shows the block groups with above 20% Hispanic populations. Correlation does not equal causation, but at least through this map you see the areas with high concentrations of this minority group that could potentially be displaced.

V. Conclusion

Greenbelts have been established in cities such as Toronto (2005) and Seoul (1970) and have been a forerunner in making a case for the benefits of a greenbelt. Benefits of local agriculture, green space, and centralized growth are reasons to be hopeful for a greenbelt. Both cities have benefitted economically, politically, socially, and internationally as a result of the greenbelt's success. Economies grow as a result of spatial growth not being an option, political forces may change with redistricting, and socially people will live closer to one another thus decreasing the fence driven American culture. Both Toronto and Seoul's scope and scale are much larger than the city of Greenville as well as Greenville County, and so it may not be fair to be comparing Greenville to much larger metropolitan area. Despite the difference in scale, this research proves the greenbelt is feasible as a result of the environmental parameters within the county, but just because it is feasible does not automatically indicate Greenville County as a primary candidate to implement a greenbelt. The research towards poverty, income, as well as a special focus on Hispanic populations have indicated that the implementation of a greenbelt, in conjunction with the effects other greenbelts have had socio-economically on communities, could negatively affect some groups. Too often unintended externalities are not considered because they are not the intention of the action; however, with the enactment of a greenbelt as currently proposed through GIS software, it is hard to imagine an outcome where those of lower socio-economic stature (income and poverty) are not impacted somehow. Seoul specifically has shown through timeline research how the greenbelt introduction can change the economic landscape of a city and create sizeable issues, and the same holds true for those in Greenville. Satellite communities and jump growth can be thwarted through inclusive growth that does not expose the marginalized.

V.I. Future Research

I hope that the findings as a result of this project would play a large role in the consideration of the creation of a greenbelt in Greenville. The introduction of a greenbelt plays largely in the minds of it's inhabitants both mentally and visually, but even more important is the ways in which a greenbelt would directly affect the socio-economic climate of a region. Future research should be fully-encompassing by looking at feasibility, introduction, and implementation in order to divulge the physical, social, and economic benefits for all involved. There are costs associated with the greenbelt as well, but as long as these are taken into account and weighed properly versus benefits, the greenbelt implementation would go smoothly

VIII. Acknowledgements

VII. References/ Data Sources

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