

Plantation Geography to Global City: Density in Barbados

Barbados is a tropical island nation at the southeastern edge of the Caribbean Sea. Like many of the former colonial provinces in the region, the Barbadian economy has been challenged by shifts in the global economy that have called to question its current economic and land use model. The current land use model come from both a colonial agrarian economy inherited from the British and a post-war suburban sprawl emulating the landscape of North America and Britain.

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Changes would lessen the negative impact of that the current model has on the climate by providing a way to return most of the island's land to its natural pre-colonial landscape.

Central to the economic challenges that Barbados has experienced is a decline in the competitiveness of its agricultural sector which had historically been oriented toward sugar production. Sugar production in Barbados has remained small scale relative to industrial scale alternatives that have grown in Brazil and other main land nations. Other major industries in Barbados are resort tourism, which blossomed as air travel became affordable, and a service sector centered on distributing goods through the tourist economy. While lucrative, resort tourism in Barbados offers limited growth potential as costs on the island are high relative to other Caribbean destination, and there is little room on the coasts for new large resorts preferred by North American tourists. Attempts to diversify the economy into off-shore financial services and light manufacturing have produced mixed results, and have yet to become drivers of the economy.¹

TOURIST INDUSTRY ENERGY INTENSIVE

There are additional reasons to consider changes in land use and economic activity in Barbados. Alternative land use strategies would lend themselves to different economic activity, and mitigate the negative impact of resort tourism and agriculture in tropical environments. Resort tourism relies on frequent air travel which is carbon intensive, and in the case of Barbados, primarily to and from Europe and Canada. Regardless of the local aesthetic, interiors of building accommodations function to international standards that depend disproportionately on artificial lighting and air-conditioning as opposed to design that respond to local environmental conditions.

International tourism has grown rapidly over the last sixty years as international arrivals have gone from approximately twenty-five million arrivals per year in 1950, to over one-billion arrivals in 2012. Distance traveled per person has also increased which is due to longer trips as opposed to more trips per person. Growth had also been fastest in the most energy intensive form of travel which is air travel. Currently, air travel accounts for approximately forty per cent of carbon emissions from tourist related travel. Estimates place tourism as responsible for around five percent of the world's carbon emissions. These emissions include not just means of travel, but construction and operation of air ports, hotel and other support facilities.²

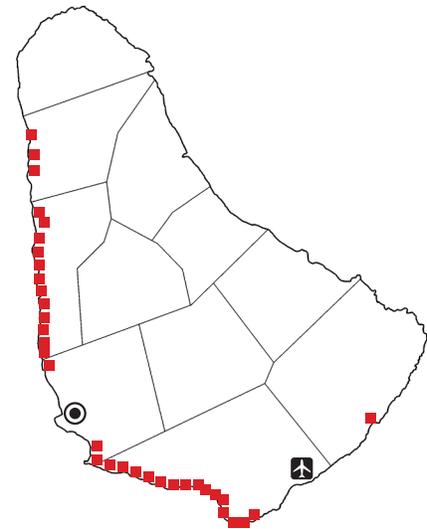
Climate change in tropical areas invested in tourism could have a compounding effect on the nature of accommodations in these areas as conditioning systems are energy intensive. Hotel operators have been slow to implement energy saving measures such as utilizing passive design strategies. Implementing less shocking technologies such as light sensors, LED lighting, air-condition systems that are on timers, or activated by room cards can also be effective in offsetting energy use. In a hotter world, particularly in the tropics, there will be even more heat to manage and mechanical air-conditioning will contribute even carbon emissions unless use is reduced, or efficiencies increased.

Increased intensity of hurricanes can also affect the nature of tourism and economic activity in the tropics. A study cited in the book *Tourism and Climate Change* estimates that the economic cost of hurricanes in the next two decade could increase five fold over the current averages for damage and disruption.³ In beach destination areas where deviations from the expected weather norm have become a concern, methods for hedging weather risk have arisen. In 2009, the Barbados Tourism Ministry offered a weather insurance program that offered tourists who enrolled compensation if the weather deviated from the historical norm.⁴

Sea level rise is another concern for tourist regions that are located on coastal areas (Figure 1). Tourist resorts and restaurants in Barbados are disproportionately located near beaches, which have recently eroded in ways that are noticeable. Further erosion and sea rise would have a material impact on the resort tourism industry in Barbados undermining the most important industry in the country at the moment. A study on the effect of sea level rise in Martinique concluded that attractiveness of resort destinations would diminish as beaches compress and the area between the water and resort buildings decreases. Conservative estimates of the percentage of resorts that would be severely impacted by sea level rise in Barbados at around half of the current resorts⁵

LAND USE

Starting over four-hundred years ago, the tropical landscape of Barbados was cleared by colonial settlers for the development of plantations. In the context of a pre-modern world with lower global population levels and energy use, the negative environmental impact of converting the natural landscape to farm land was negligible compared to now. Although sugar production currently accounts for a small fraction of GDP today, a significant amount of land continues to be dedicated to sugar cultivation although the number of acres has been in decline.⁶ Maintaining a large proportion of land for the sugar cultivation is not a responsible use of land in light of current threats of climate change and development trends in other tropic locations such as Brazil where



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Figure 1: Location of Major Resorts

deforestation is happening at an alarming rate. While it is difficult to demand that an emerging nation such as Brazil to not convert forest to farmland, it is less difficult to consider scaling down farmland where it is not as productive. Forests in non-tropical climates which are less concentrated in vegetation than tropical forests, were largely deforested centuries ago, and are not likely to be replenished in the near future. Tropical forests are disproportionately located in developing countries.⁷

Land outside of Barbados's capital city Bridgetown that is not dedicated to tourism or agriculture is generally occupied by low density residential development that resembles suburban land use in the United States and Europe. Car ownership rates in Barbados are high, with nearly half of adults owning cars, and the road network extensive despite the existence of public transportation network primarily used by lower income residents. As a result there is little land left in Barbados that resembles the natural landscape that predated colonial settlement. Despite land use patterns that are based on a colonial legacy and tourism, there are ways that the country can steer development toward a model that is more consistent with environmentally responsible land use and that takes advantage of location, existing infrastructure, and human capital.⁸

GLOBALISM

Most English speaking Caribbean islands face challenges of global competitiveness as the value of goods and services exported general exceeds the value of imports. Unlike most of these nations, Barbados currently has a realistic chance of overcoming this trend.⁹ With the exception of tourism, the Barbadian economy has limited financial engagement with the outside world as tourist dollars are circulated in the country and exchanged for imported finished products. Central to the potential of Barbados is the relative high level of education of its citizens which is due to continued investment in maintaining the quality of its education system, something that is vital to fostering value added manufacturing and service industries. Additional factors working in the favor of Barbados are its strategic location, and a culture of law and order.¹⁰

Perhaps the greatest asset Barbados has is its location which is located at the intersection of international shipping routes between South America and the eastern half of the United States, as well as between the Pacific Ocean and Europe. Contingent on expansion of its port, Barbados can gain as both a manufacturing point with strategic sea access, as well as a distribution center for the international cargo. The Bridgetown port is able to handle large container ships as the depth of the harbor has been dredged to eleven meters, but is too small to service the container ships and cruise ships at the same time. Of the five large berths, only two can service container ships. Currently the government is investigating the option of building separate cruise ship handling facilities so that the existing large cargo ship berths can be used more effectively.¹¹

Cruise ship handling facilities in Barbados are considered the most advanced in the Caribbean and the location convenient to the historic Bridgetown and the premier resorts. The coastline facing the Caribbean Sea plays a significant role in the islands tourist economy although locations for the new resorts are limited since areas adjacent to high quality beaches are already developed and are pinched by the main coastal thoroughfare. More resorts could jump the road, but this would lead to overpopulation of the beaches which are small, limiting their desirability.

HISTORIC BRIDGETOWN

Bridgetown should be central in a long term vision for the island. It has a population of almost 100,000 people within a land area of fifteen square miles. Bridgetown enjoys a strategic location, higher density than the rest of the island, and a historic district that was declared a UNESCO World Heritage Site in 2011. Established by British colonialists, the city can trace its history to the seventeenth-century. In its early days, the city served as the regional capital for the Windward Islands. The island's strategic eastern Caribbean location served well as base of operation for military operations in the region. It also served as major port for the transatlantic slave trade.

Bridgetown was built around its old harbor, now called the Careenage, which is a narrow quarter mile long inlet that forms a channel averages one-hundred and fifty feet wide (Figure 2). The inlet which can't be utilized by most commercial boats due to its small size and low bridges now harbors yachts and small recreation craft. It is bounded by modest historical buildings that served as industrial and warehouse functions in the colonial period. Bridgetown's serpentine network of streets, particular to British colonial settlements in the region, has been cited as a historic asset by UNESCO. The streets have maintained their integrity over time and help give the city a unique character.¹²

Many institutional and commercial buildings date back to the British colonial period are local variations of the dominant British architectural style. Examples of significant buildings included the two-story National Parliament Building (Figure 3) was constructed around 1870. Adjacent to a formal plaza, the cathedral shaped gothic styled masonry structure features tall arched stained glass windows and two prominent towers. It is located within a short distance of the Nidhe Nation Synagogue which is an active religious institution is the site of one of the oldest Jewish congregations in the western hemisphere. The synagogue was formed by migrants from Brazil around 1620 when they introduced sugar cane production to the island. The building is located at the center of historic Bridgetown near the Parliament Building.

The three-story Barbados Mutual Life Building (Figure 4) is an example of regional late-Victorian architecture and is the most prominent building in historic Bridgetown. It is a well maintained building that apart from its size can be identified by a white iron covered balcony that wraps the three visible facades. Additional iconic features are two metallic finished domes that sit atop symmetrical tower extensions. Other significant civic scaled buildings include St. Mary's Church and the Church of St. Michael. Perhaps the most important characteristic of the city are its colorful vernacular structures that line the narrow streets of the historic center. While most of these buildings have been neglected in the orthodox sense, they still retain enough character that recalls the historic architectural traditions of the city.

The Garrison (Figure 5) is an historic ground that lies at the southern end of the city was the regional headquarters for the British military in the Caribbean. Many of the historic structures remain and have been reprogrammed to buildings housing government functions. The Garrison includes many notable structures including the historic St. Ann's Fort which houses a historic gun collection, the Main Guard Building which has a prominent clock tower, The Barbados Military Cemetery dating to 1780, the Pavilion Building which was a former military hospital, and a former military prison that now is



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Figure 2: Photo of the Careenage.

Figure 3: Photo of the Parliament Building.



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Figure 4: Photo of the Mutual Life Building.

Figure 5: Photo of the Garrison.

home to the Barbados Museum and Historical Society. Of potential interest to Americans is the George Washington House where the first US president stated in 1751 on his only trip abroad.

By preserving historic sites in the city, Bridgetown can become a more desirable place to live, visit, and do business in. The existence of historic structures, street patterns, and proximity to the sea are particular assets that Bridgetown and Barbados should capitalize on as it seeks to improve quality of life and make its economy more competitive. Cities have not only preserved buildings so that they make for an attractive tourist destinations, many affluent individuals desire to live and seek social activities in areas with charm. The scale of the historic Bridgetown center of the city is similar to other cities that have deliberately protected structures and encouraged the revitalization of building stock such as those in Charleston, South Carolina.

LEARNING FROM CHARLESTON

There are similarities between Charleston and Bridgetown that can provide motivation and guidance for the preservation and development of the Bridgetown core. Both Bridgetown and Charleston are approximately the same age and developed in similar ways, fueled by slave driven labor intensive agriculture. The similarity is less that coincidental as Charleston was founded by merchants from Barbados and commercial ties remained during the colonial era. Connections can be found in the architecture of both cities and the culture of the Carolina Lowcountry. Both cities are walkable and have similarly sized populations.

Preservation of historic buildings and sites in both Charleston and Bridgetown is possible because of a paucity of new construction within their city cores. Charleston capitalized on this by in 1931 creating the first central historic district in the United States, and later financially supporting the revitalization of structures within this zone and the entire city. Preservation in Charleston declined after World War II, but was rejuvenated when a comprehensive plan was commission in 1974 which led to listing over 2800 structures as protected structures. Promotion of preservation and tourism in Charleston has led to direct economic benefits.¹³

The tourism industry in Charleston has increased dramatically in the last few decades and played a significant role in the resurgence of its economy which suffered with suburban flight. Charleston began to study the connection between tourism and its economy in 1979 which led to the formation of a Division of Tourism Management. Despite drawbacks that tourism was perceived to bring such as litter, there was generally support for tourism in Charleston because of perceived economic benefits. Among the economic benefits are the jobs for moderate income individuals that a tourist industry brings, something that is vital in a region that has few driving industries such as Charleston. Another benefit is that economic activity can help alleviate concerns that preservation is elitist and top down, something that has plagued the preservation movement.¹⁴

VIRTUES OF DENSITY

Bridgetown and Barbados can benefit from a two pronged development and land use strategy. In addition to preserving Bridgetown, the island can move toward concentrating development. Encouraging development immediately

around the historic Bridgetown would allow more of the land around to the country to be used for industry, utilized for high intensity farming, or taken off line; something that would reduce the islands footprint. Barbados should put a cap on resort tourism, and channel residential, commercial, and tourist investment in its capital city.

Despite higher land acquisition and construction costs, there are strong reasons to encourage development in cities as opposed to low density development in former or current rural areas away from city centers. Cities offer greater potential for optimization of human capital than non-urban areas, greater mobility, and greater opportunity to reap the benefits of a global economy. Urban areas also offer more access to a variety of experiences, including social interactions, something that highly educated individuals tend to seek out.¹⁵

There are also ecological reasons for encouraging urbanism. In *Green Metropolis*, David Owens argues that dense cities are greener than non-urban settlements because they are land-efficient, encourage non-vehicular mobility, and make material accumulation difficult. Buildings that are situated adjacent to each other in dense cities share common walls which reduces the amount of surface area that contributes to heat loss and gain. Because taller buildings have less surface area relative to interior area, they have less surface that is exposed to solar radiation which contributes to heat gain in buildings. Taller buildings foster a concentration of activity that is necessary to support an effective public transportation sector. Unlike cars which are dedicated to individuals, elevators are shared, thus distributing the energy cost of their operation.¹⁶

Housing units are also generally smaller in urban areas reducing the amount of material that those occupying them can accumulate. High density urban housing generally comes without lawns, sprinkler systems, and swimming pools found in suburban areas. Not only is consumption less per individual living in urban centers, but the amount of waste that they produce is less than their suburban peers.¹⁷ Edward Glaeser, a Harvard economist has confirmed this in a study that demonstrated that the carbon footprint of urban residents in the United States is significantly less than the carbon footprint of suburban residents who have larger houses and rely more on automobiles for transport.¹⁸

LEARNING FROM SINGAPORE

Barbados can also stand to learn from the rise of Singapore, another former British territory. The economy of Singapore has experienced rapid growth since the country achieved independence from Britain in 1959 and later Malaysia in 1965. Currently considered one of the most productive and wealthy nations in the world, the growth of Singapore was not accidental as it followed a deliberate plan toward globalization.¹⁹ Growth in Singapore occurred in stages, the first of which was the establishment of the country as a regional transportation and communications hub, followed by its establishment as a manufacturing site for the assembly of electronic devices. The next phase involved the transition of the country to a financial and management center for multinational companies seeking a stable presence in the region. Most recent transformations involved the development of a tourism and travel infrastructure to complement continued expansion of the financial and business sectors.²⁰

Because Singapore like Barbados has a small land mass, implementation of a sound land-use policy that encouraged density of development was key. Agricultural land has been conveyed to industry, housing, and transportation uses, while housing development concentrated in dense high rise developments near the urban core. Car ownership has been discouraged by charging significantly for car use, while simultaneously invested in public transportation. By minimizing car traffic, Singapore has been able to maintain a high quality of street life, something that has contributed to its livability and desirability as a business destination. Over time, areas dedicated to commercial office space expanded moderately as older building stock was replaced with taller buildings.²¹

Edward Glaeser attributes much of the success of Singapore to its concentration of smart people and competent management from the private sector. The government compares favorably to other developed nations in terms of low corruption and its competency. In addition to reliability of services, streets in Singapore are safe, clean and uncongested. Strategies for Singapore included an effective combination of free market capitalism and state led industrialization. A key component was investment in education which has resulted in some of the highest science and math test scores in the world. Highly educated citizenry along with a willingness to attract talent from abroad have proven instrumental attracting business to the island.²²

RECOMMENDATIONS

Economic growth can be at odds with preservation of buildings, natural landscape, and vernacular culture. Oftentimes, in the context of a global economy, pressures lead to privileging economic growth lest a nation fall behind. Barbados is no exception, encouraging development of high end residences and resorts that can compete with other tropical destinations that cater to the affluent. Anthropologist Scott Fitzpatrick has identified how development of a marina was at odds with preservation of a cultural archeological site near Speightstown in northwest Barbados. Fitzpatrick argues for stronger laws to protect cultural sites, educational campaigns among local residents to gain support for preservation projects, and cooperation with developers undertaking projects in the vicinity of historic sites. Ultimately, cultural sites can better be integrated into typical tourist attractions as a way of increasing engagement and support.²³

Implementation of strict land-use policies can also seem at odds with economic development. However, this might not always be the case as has been demonstrated in Singapore. Discouraging rural development, and controlling development in the historic core, would channel resources to places that could also provide economic benefits. The development of historic Charleston into a historic destination has not diminished the viability of other business activities in the Charleston region. Development in a concentrated area has resulted in more vibrant urban area whose attractions that can compete with other forms of leisure. Charleston has also become a desirable place to work, lessening the appeal of outlying locations.

Barbados can also benefit from a strong land use policy that discourages low intensity building at the periphery. Resources can be focused in the city and rural lands returned to natural state with increased density of green matter. Impending climate change compels a vigorous shift in land use and building use, particularly in tropical regions where the loss of natural growth is most

significant. Despite the fact that many tropical nations are developing rapidly and are seeking ways to compete with advanced economies, strategies for smart growth and development should be implemented as part of a long term project for a sustainable environment. The island nation of Barbados is particularly well suited to making the shift from a sprawl toward better use of its central city.

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