Planning and the Climate Change in the Caribbean

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Abstract

Climate change poses a tangible threat to countries throughout the world, affecting populations, economies, environment and overall security. As more studies, reports and statistics are released, it is becoming clearer that the threat to the Caribbean is most immediate and severe. This working paper addresses the important role the planning profession plays in climate change mitigation and adaptation in the Caribbean and reviews the impacts of climate change in the region. The working paper introduces the Caribbean Planners Association (CPA), as a credible planning body that can speak on behalf of Caribbean planners and raise awareness about climate change and the overarching role of planning throughout the Caribbean.

Keywords: Caribbean Planners Association, Caribbean Urban Agenda, climate change, urban planning

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Planning and the Climate Change in the Caribbean

Introduction

Climate change poses a tangible threat to countries throughout the world, affecting populations, economies, environment and overall security. However, as more studies, reports and statistics are released, it is becoming clearer that the threat to the Caribbean is most immediate and severe. A politically, linguistically and culturally diverse region, the Caribbean is most commonly known as a beach-oriented tourist destination. A lesser known fact, but just as relevant, is that the Caribbean is a widely urbanised area, home to millions of people who are directly feeling the effects of climate change. For the purpose of this working paper the focus will be on how climate change impacts the 15 member states of the Caribbean Community (CARICOM)[1], which is comprised of a population of roughly 17 million.

In 2008, the United Nations Environment Programme's Regional Office for Latin America and the Caribbean released a report entitled Climate Change in the Caribbean and the Challenge of Adaptation that describes the expected impacts of climate change in the Small Island Developing States (SIDS) of the Caribbean[2]. The report notes that small island developing states (SIDS) located within the Caribbean basin face an increased risk of being adversely affected by the impacts of climate change, despite having a minimal role in the activities and outputs contributing to it. Specifically, the report states that while SIDS contribute less than one percent of global greenhouse gas (GHG) emissions, they already experience adverse effects of climate change including: sea level rise, tropical cyclones/hurricanes, droughts, increasing sea surface temperatures, and coral bleaching. Approximately 70 per cent of the Caribbean SIDS population lives in coastal cities, towns and villages (UNEP 2008).

The challenges presented by climate change in the Caribbean are many, but mitigation and adaptation strategies can help minimize the impacts. Improved coastal zone management, strategic land use planning and hazard mapping are examples of professional planning techniques that can combat climate change. The Caribbean planning profession, as supported by the Caribbean Planners Association (CPA), can be a vehicle to address these challenges by offering a network where professional planners share practical knowledge and effective planning

[1] CARICOM member states include the English-speaking islands of Antigua & Barbuda, Bahamas, Barbados, Dominica, Grenada, Jamaica, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago, the French-speaking Haiti, and the mainland countries of Belize, Guyana and Suriname. The Greater Caribbean, as referred to by the Association of Caribbean States, comprises 28 states bordering the Caribbean Sea, including all 15 CARICOM member states, with a total population of 237 million people.(http://www.acs-aec.org/index.php?q=about/faq). It is also important to note that all 15 CARICOM members are defined as SIDS, including the three mainland member states of Guyana, Belize and Suriname.

[2] The Caribbean is home to 16 of the 51 countries included in the UN's official list of SIDS (http://www.un.org/special-rep/ohrlls/sid/list.htm). In addition to the 15 CARICOM member states, the 2008 UNEP report also includes Cuba and the Dominican Republic in its definition of the Caribbean. Note that Montserrat is a member of CARICOM, but is a British Overseas Territory, and therefore not included in the report's reference to 16 Caribbean SIDS.

techniques geared towards both mitigating and responding to the impact of climate change in communities throughout the Caribbean.

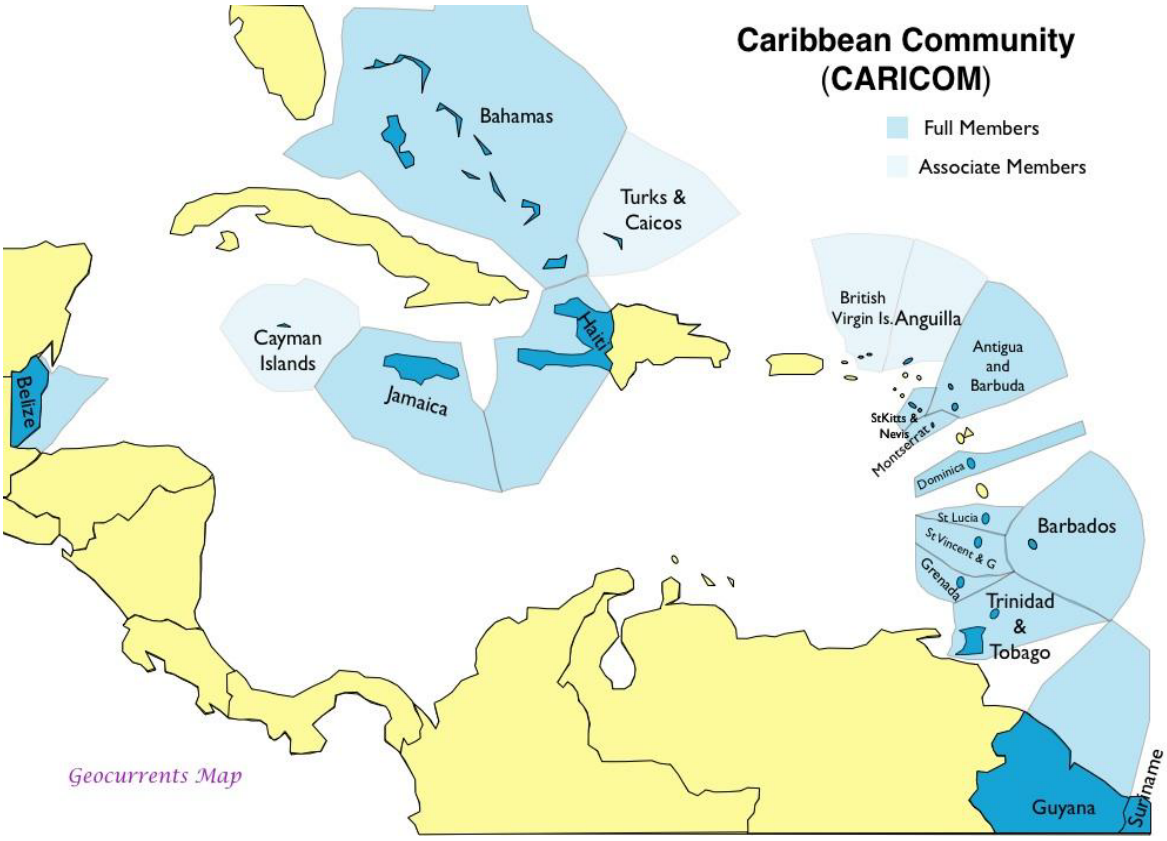
This working paper addresses the important role the planning profession plays in climate change mitigation and adaptation in the Caribbean and reviews the impacts of climate change in the region. Additionally, the working paper introduces the Caribbean Planners Association (CPA), a credible planning body that can speak on behalf of Caribbean planners and raise awareness about climate change and the overarching role of the planning profession in creating thriving and resilient communities throughout the Caribbean. This paper is the first installment in a series to be distributed as part of a joint effort between the CPA, the Lincoln Institute of Land Policy, the Caribbean Network for Urban and Land Management (CNULM), the American Planning Association (APA) and the Canadian Institute of Planners (CIP). The series is not intended to be research-based but rather a way to elevate the discussion between professionals in planning and related fields to demonstrate how planning can effectively address planning challenges in the Caribbean.

Defining the Caribbean

The Caribbean is a collection of islands and coastal states comprised of diverse geographies and languages and with historical ties to cultures all over the world. As such, defining the Caribbean can be a difficult task. Conducting research, determining baseline data and finding accurate statistics is challenging, as terms are often defined or understood differently throughout the region. Compounding these complexities, the Caribbean is also often bundled together with Latin American countries, an association that can lead to a lack of attention and resource allocation to the area. The difficult task of defining the Caribbean has been noted by several sources. Drawing a strict boundary around the Caribbean region is not possible. Definitions vary considerably and may be based on "language, identity, geography, history and culture, geopolitics and geo-economics, or organisation (Verrest, Girvan 2005)." Some definitions focus only on the smaller islands (mainly the English speaking), whilst others include all islands and others extend this with the main land states entering the Caribbean Sea or even the Diaspora communities (Verrest 2007). Given this difficulty in establishing what defines the Caribbean, it is necessary to adapt and promote a regional perspective dedicated to understanding impacts of climate change and solutions needed to mitigate these impacts. For these reasons, the paper relies on boundaries corresponding to two established political organisations within the region: the 15 member states of the Caribbean Community (CARICOM), and the 28 member and associate member states of the Association of Caribbean States (ACS)[3].

[3] The paper focuses mainly on the 15 member states of CARICOM, but also refers to the Greater Caribbean region, comprising the 28 member and associate member states of the Association of Caribbean States. Currently, finding statistics that correspond accurately to either the CARICOM or ACS is a challenge, and requires research beyond the scope of this working paper. This paper's major sources both acknowledge this challenge (UNEP 2008, UN Habitat 2012) which also presents a future research opportunity focused on developing better statistics that more closely correspond to the realities of CARICOM and ACS countries.

Figure 1 Map of the Caribbean Highlighting Members of CARICOM



Source: http://geocurrents.info/wp-content/uploads/2011/03/Caricom44.jpg

Caribbean Urbanisation and Coastal Development

Consistent data and research on urbanisation and coastal development throughout the Caribbean, despite improving, is still difficult to find. While this is not an issue exclusive to the planning profession, it does pose challenges when attempting to determine resilient coastal development plans. Furthermore, when there is conflicting or insufficient data it becomes difficult to advocate for policies promoting adaptation strategies to climate change and sustainable urban development practices, especially when perception does not reflect reality. For example, while there is a widespread perception of the Caribbean as a collective island paradise dotted with pristine beaches and remote coastal villages, the reality is that a majority of Caribbean islands are highly urbanized areas and face similar infrastructure, solid water management and public health issues found in other urban regions, albeit at a smaller scale. "While on the average 66 per cent of the Caribbean population[4] is urban, the national situations are mixed, ranging from 30 per cent in Antigua and Barbuda to 84 per cent in the Bahamas (while in territories such as Anguilla and

[4] It is important to note that the UN Habitat definition of the Caribbean excludes mainland Belize, Guyana and Suriname, and includes all islands within the Caribbean Sea basin. Please see Box 1.1 p.19 in the 2012 UN HABITAT State of Latin American and Caribbean Cities Report. This report is available for download from the UN Habitat website.

the Cayman Islands the entire population is considered urban) (UN Habitat 2012)." Furthermore, the majority of the region's population lives within close proximity to the coastline. According to UNEP (2008), approximately 70 per cent live in coastal settlements, and more than 50 per cent are living less than 1.5 km from the coast. With a heavily populated coastline there is the potential for large numbers of environmental refugees. An estimated and staggering 70 per cent of Caribbean beaches are eroding at rates of between 0.25 and nine metres per year (UNEP 2008). However, the Caribbean coast continues to be a strong driver for tourism, resulting in increased development along the coast. Unfortunately, development has occurred "in the absence of coordinated land-use planning and development controls…encouraging patters of urbanization which have rendered coastal infrastructure vulnerable to climate variability and change (Lewsey 2004)." Systems and tools meant to guide land use and control development are in place throughout the region but the effectiveness of these systems is constrained by various factors, including outdated national plans, limited professionals and staff needed to enforce plans and building codes, and inadequate enabling legislation. Plans, building codes and a system of development control are intended to ensure the safety of both human life and commercial and residential structures located along the coast. However, limited enforcement has led to poorly constructed buildings and populations residing in areas vulnerable to sea level rise and other impacts of extreme weather events.

While the Caribbean has had a minimal contribution to the current and projected climatic reality on a global scale, the entire Caribbean region will be forced to face head-on the challenges directly related to the effects climate change (UNEP 2008). Many Caribbean economies are dependent on agriculture and tourism, both of which are industries directly threatened by climate change. Coral reef degradation, sea level rise, retreating shorelines and temperature increases all negatively affect crop production, weakening the agricultural component of Caribbean economies. Many Caribbean countries rely on tourism as their main economic driver. Increased frequencies of extreme storm events damage infrastructure, which directly impact tourism. In addition, the tourism industry creates planning challenges at high season (typically December through May), yielding a sharp influx of tourists and adding further stress to already weak infrastructure and resource needs, including solid waste management, potable water and electricity.

It is within this challenging framework that the Caribbean planning profession has an important role to play in helping to identify, advocate in support of, and ultimately help to implement multi-sector, multi-stakeholder responses using planning tools and practical planning knowledge grounded in the Caribbean reality.

Planning in the Caribbean

Professional planners play a critical role in the development of cities, coastlines and urban regions and are tasked with ensuring that the economic, environmental and social components of both urban and rural environments are maintained. Tasked with being both visionary as well as pragmatic, good planners strive to look ahead and anticipate unintended as well as intended consequences, which is especially important when planning for the impacts of climate change. In order to meet modern day planning challenges (for example climate change) which are

juxtaposed with traditional planning challenges (for example infrastructure), planners must actively work together to devise integrated and forward looking solutions.

> Planning, also called urban planning or city and regional planning, is a dynamic profession that works to improve the welfare of people and their communities by creating more convenient, equitable, healthful, efficient, and attractive places for present and future generations.[5]

Expanding access to information, knowledge exchanges and promoting education and public participation shapes this way forward. While professional networks in the Caribbean have traditionally faced the challenge of geographic distance and separation by water, the internet has allowed for increased as well as more cost-effective communication among professionals. With technological advances, networking among Caribbean universities, specifically in Trinidad, Jamaica, Guyana and Suriname has improved tremendously. These connections have been reinforced by the establishment of The Caribbean Network for Urban and Land Management (CNULM) at the University of the West Indies (UWI) in 2009[6] and the launch of the CPA in 2012.

In the Caribbean, planning procedures and regulations can be traced back to those who colonized the region, specifically the British, Dutch (in Suriname) and French (in Haiti). Traditional planning was viewed as reactionary and based on past trends to inform current decision-making. This top-down institutional approach to planning was adapted to the Caribbean experience, but is still largely a remnant of the colonial era. In contrast, the 2006 Vancouver Declaration, an outcome of a Global Planners Network meeting at the 2006 World Urban Forum, outlined the ideas supporting the needs of the modern day built environment and socio-economic realities, many of which must be seen through the lens of climate change. The need to "ensure environmental sustainability," address the "challenges of rapid urbanization, the urbanization of poverty and the hazards posed by climate change and natural disasters must stem from a more inclusive planning process (Vancouver Declaration 2006)." The Vancouver Declaration notes that planning is both strategic and local, integrative, participatory, creative, embracing cultural diversity and rooted in concerns for equity. It is through the spirit of planning that communities, comprised of both the public and private sector, community groups and academics, will reduce vulnerability to natural disasters and climate change, create environmentally-friendly cities, reduce new slum formation, build sustainable economic growth, and ultimately plan safer, more resilient cities. Many communities already have such policies, frameworks and procedures in place, but the dynamic nature and reality of climate change requires revision of such regulations and policies to meet the needs of communities and municipalities. "Planners support policies requiring climate change plans that provide a framework for decision-making and actions... but which are flexible enough to address the continuing complexities and uncertainties of pace and degree of change (APA 2011)." Notwithstanding the modest role played by the Caribbean region in contributing to climate change, planning methods do have an important role to play in

[5] From the American Planning Association. See: http://www.planning.org/aboutplanning/whatisplanning.htm

[6] The focus of the CNULM is to facilitate the relationship between people and urban areas through a collaborative multi-stakeholder approach in the effort to contribute to social equity, environmental justice and improved livelihoods in the Caribbean. The CNULM is also known as "blueSpace" to capture and promote the image of Caribbean communities and organizations working together to address their developmental needs.

mitigating some of these contributing practices. Land use planning influences the structure of cities, including the relative location of housing and employment and resulting transportation behaviour. Achieving a more compact urban form, a greater mix of land uses, and enabling sustainable building design all work towards reducing energy use and greenhouse gas emissions. Mitigation practices such as these have the additional effect of supporting the long term economic sustainability of Caribbean societies by addressing one area of considerable vulnerability: a high dependency on carbon-based energy imports (Verrest 2011).

The Caribbean professional planning community has existed in the Caribbean for over 50 years, when countries began to gain independence (Caribbean Planners Association Business Plan 2013). Due in large part to the small size of national planning professions, only four of the 15 CARICOM member states currently have established national planning associations (Barbados, Jamaica, Trinidad and Tobago and Belize). The launch of the Caribbean Planners Association (CPA) in March 2012 is meant to offer support to professionals based in other countries working towards the establishment of national associations.

The CPA supports a region-wide approach to help enhance the capacity of the planning profession and the promotion of collaboration and best practices throughout the Caribbean. The CPA was endorsed by CARICOM and Council of Economic Trade and Development (COTED) in 2011. COTED's 39th meeting in 2012 further supported the CPA as a mechanism to "build on the existing network of planners and advance the profession throughout the Caribbean (http://bluespacecaribbean.com/)." The role of the CPA is to support planning practice and professionals in the region through sharing resources in research, training, and practical experience. The goal of the CPA is to promote a regional perspective to these challenges, demonstrating how planning is an effective tool in overcoming obstacles facing the region.

The Impact of Climate Change in the Caribbean

As a collection of small island states and low-lying coastal mainland countries, the Caribbean's climate change vulnerabilities include sea level rise, increased water and surface temperatures and an intensification of meteorological events such as storms and hurricanes. As outlined the table below, temperatures in the Caribbean region are estimated to increase anywhere from 0.6 Celsius to 2.7 Celsius by 2050 in low and high-impact scenarios of climate change. The resulting heat stress will affect the health of coral reefs, which are highly sensitive to temperature increases, and strain agricultural production and energy consumption. Sea level rise is expected to range from 9cm to 57cm by 2050, resulting in beach recession and the intrusion of salt-water to the water table, which is problematic as freshwater resources are already scarce in some Caribbean countries. "At current population levels, the available water supply in some of the Caribbean SIDS is significantly lower than the international limit of 1000m³ per capita, per annum (UNEP 2008)." Countries with water supplies below this threshold are considered water scarce.

Additionally, approximately 70 percent of the region's population and construction is concentrated in the coastal area and is exposed to increased wind, stronger ocean surges and heavier rains (Bueno et al 2008). The anticipated rise in extreme weather events such as

hurricanes will require improved disaster preparedness and hazard planning in order to decrease vulnerability.

Table 1 Two Future Climate Scenarios for the Caribbean Region

		2025	2050	2075	2100
Annual Average Temperature Increase *(in degrees above year 2000 temperature)*					
Low-Impact	°F	0.6	1.1	1.7	2.2
	°C	0.3	0.6	0.9	1.2
High-Impact	°F	2.4	4.9	7.3	9.7
	°C	1.3	2.7	4.1	5.4
Sea-Level Rise *(above year 2000 elevation)*					
Low-Impact	in	1.8	3.5	5.3	7.1
	cm	4.5	9.0	13.5	18.0
High-Impact	in	11.3	22.6	34.0	45.3
	cm	28.8	57.5	86.3	115.0

Source: Bueno et al 2008

The Economic Impact of Climate Change: A Move to the Green Economy

Numerous reports express concern for the economic impact of climate change in the Caribbean. A report by Bueno, et al. (2008) estimates the cost of climate change in the Caribbean in 2050 to range from $5.7 billion USD to $27.6 billion USD, based on projected economic impact from storms and loss of tourism and infrastructure (See Table 2 below). Underscoring this concern, UNEP (2008) states that "relative to its size, the island population of the Caribbean is more dependent on income from tourism than that of any other part of the world" making it clear that revenue from tourism will be adversely affected by climate change. In addition, infrastructure and building damage from sea level rise and increased intense weather events is expected to negatively impact the economy. It is "estimated [that] the cost per affected household of reconstructing housing, other buildings, roads, and infrastructure lost to sea-level rise, and estimated that 19 per cent of the population would be affected in the low-impact case, and 66 per cent in the high-impact case" (Bueno et al 2008).

Given these predictions, adequate planning measures are necessary to mitigate and even prevent such damage. The 37th Special Meeting of COTED in September 2011 addressed the need for a shift toward the green economy as a possible solution to the impacts of climate change throughout the Caribbean and the important role the planning profession has in this transition. The Green Economy is identified as:

> An approach whereby multiple economic and environmental challenges within cities are addressed in an integrated fashion that creates incentives for sustainable practices, promotes competitiveness, healthy liveable physical environment, and reduce [sic] dependency on high carbon generating energy sources. The concept of a green urban economy offers a practical operationalization of the goals of sustainable development by

creating a concrete nexus between economic development, the social and physical environment. (COTED 2012)

Table 2 Caribbean Region: Low- and High-Impact Scenarios

Total Caribbean	Climate Change Scenarios: $US Billions			
LOW-IMPACT	**2025**	**2050**	**2075**	**2100**
Storms	1.9	2.0	2.0	2.1
Tourism	0.4	0.8	1.2	1.6
Infrastructure	1.5	2.9	4.4	5.9
Total	**$3.8**	**$5.7**	**$7.7**	**$9.6**
% Current GDP	**1.8%**	**2.7%**	**3.6%**	**4.5%**
HIGH-IMPACT	**2025**	**2050**	**2075**	**2100**
Storms	3.1	4.7	7.0	10.0
Tourism	2.0	4.0	6.0	8.0
Infrastructure	9.4	18.9	28.3	37.8
Total	**$14.5**	**$27.6**	**$41.3**	**$55.8**
% Current GDP	**6.8%**	**13.0%**	**19.5%**	**26.3%**

Sources: Authors' calculations. Amounts in 2007 dollars; percentages based on 2004 GDP.

Source: Buenos, et al. 2008.

Given the intended goals of the Green Economy, the CPA stands to play a role in contributing to and helping to shape the dialogue surrounding the Caribbean green economy through knowledge sharing and networking among planning professionals in the region.

Adapting to Climate Change: Case Studies from the Caribbean

Recognizing the challenges posed by climate change, countries throughout the Caribbean region are responding with programs and systems to mitigate and adapt to a changing climate. Integral to these responses are the tools, methods and practices employed by the planning profession, including, but not limited to, long-term planning, integrated planning, stakeholder engagement, geographic information management and mapping.

The case studies in this section draw on planning experiences from three geographically and economically diverse Caribbean countries. Barbados is an island state with a population of 200,000 with a well developed economy characterized by high per capita incomes, and strong indicators of development. Guyana is a mainland country with a large hinterland, and one of the region's least developed economies, while Dominica's island economy is largely non-tourism-based with a middle level per capita income.

Planning tools and methods described in these cases are being employed to respond to the immediate and long term effects of climate change. In Barbados, these include Integrated Coastal Zone Management, coastal hazard planning, sustainable development planning, mapping beach erosion, stakeholder engagement and public awareness and squatter settlement upgrading and

regularisation. In Guyana, the case study focuses on the Low Carbon Development Strategy (LCDS) and efforts to raise awareness and build capacity among planning professionals to link their work to the LCDS. Finally, in Dominica, vulnerability to land degradation is being addressed by means of a sustainable land management policies and practices.

Barbados: Putting Multiple Planning Tools into Action

Barbados is a small-island developing state and one of the most densely populated nations in the world (UN Habitat 2012). Over 60 per cent of the island's population resides in three parishes all located on the coast and the majority of the urbanization is along the south-west urban corridor. Like many English-speaking countries in the Caribbean, the country's planning policies stem from the British Town and Country Planning system. Urban and regional planning falls under the jurisdiction of the Town and Country Planning Act (TCPA), which is the central legislation on physical planning (Udika 2009). The TCPA supports the Coastal Zone Management Act (CZMA) and requires for all coastal development to receive planning permission (Udika 2009). Understanding the importance of planning, and in what can be labeled as progressive, the National Strategic Plan of Barbados 2006–2025 addresses the critical role of the planning profession in making this plan a reality. The Chief Town Planner and the Minister delegated to planning are the principle decision-makers on coastal development.

In addition to the CZMA, the Barbados Integrated Coastal Management Plan includes planning recommendations for precautionary coastal hazard planning and the Barbados Physical Development Plan which address economically and environmentally sustainable development through several key planning principles. These include concentrating "new growth into a defined urban corridor, the protection of agricultural lands from incompatible urban development and the promotion of a strong, diversified economy through land use policies (Atherley 2007)."

Other programs are addressing the need to adapt to rising sea levels due to the increased risk of erosion along the coast. Barbados has had a number of programs to stabilize beaches, and assess and manage risk. Currently the Inter-American Development Bank is providing $50 million for a program, in which a risk atlas will be created for the entire coast of the country.

The country also has a climate change public awareness campaign with the slogan "Climate Change: Deal with It", which brings the realities of climate change to the forefront of daily life. Through posters and commercials, Barbadians are constantly reminded and educated that they must deal with climate change and not turn a blind eye to it. Experience with past projects has illustrated the need for educational campaigns and for planners to build relationships with other sectors and communities.

Finally, one area of development planning linked to climate change adaptation being addressed explicitly in Barbados is the goal of addressing settlements vulnerable to climate change. Climate change adaptation can often include reducing the vulnerability of low-income and squatter communities to extreme weather events and the resulting loss of life and property. High winds, landslides, and flooding have a disproportionately high impact on communities developed informally or illegally. In this context, Barbados' Minister of State Joseph Atherley highlighted

the importance of the planning process to be pro-poor in the development of the country's planning policies (Atherley 2007).

Guyana: Preparing for a Low Carbon Development Strategy

Bordered by Venezuela, Suriname and Brazil, Guyana is the only country in South America where English is the official language. A large area of Guyana is considered a low elevation coastal zone (LECZ), with 39 per cent of the population and 43 per cent of the country's GDP potential being at risk of significant flooding (CIP 2010, OP 2010). The economic impact of responding to a major catastrophic event was felt in 2005 when an estimated 60 per cent of Guyana's GDP was devoted to addressing the impacts of intense flooding that inundated much of the country's population and infrastructure (Horning et al 2010).

Recognizing its vulnerability to climate change, and the need for a progressive development strategy to overcome poverty, underinvestment and lack of infrastructure, the Government of Guyana has embarked on an innovative, future oriented and comprehensive development path revolving around the theme of climate change. Following two decades of economic and political re-structuring, the country has committed itself to a low-carbon development strategy (LCDS) predicated on using its vast forested lands to move towards an economy which minimizes its contribution to carbon emissions and maximizes the capacity for carbon capture. More than 75 percent of Guyana's land mass is covered by forest, more than one-third of which is Amazonian rainforest (Horning et al 2010). Forests are capable of absorbing significant amounts of carbon and therefore their conservation is crucial to climate change mitigation. It is estimated that tropical deforestation contributed approximately 15 per cent to 25 per cent of total GHG emissions each year during the 1990s (Horning et al 2010) but "Guyana has a strong history of sustainable forestry management, with no net loss of forest cover between 1990 and 2005 (Horning et al 2010)."

The intent of the LCDS is to put a value to Guyana`s rainforest that is premised on preserving it rather than removing it, and then using this financial gain to reinvest in Guyana`s long-term low carbon development. Under current conditions, the economic value to the nation of exploiting Guyana's forests is estimated to be $5.8 billion USD, reflected in the potential for timber sales, agriculture, livestock rearing and mining. This is a significant sum to a country of its size and population, especially considering that Guyana is currently CARICOM's second most impoverished nation after Haiti (Horning et al 2010). However, the core premise of the LCDS is to establish a far higher value associated with preserving the rain forest in exchange for environmental services offered to the world. These environmental or eco-system services include a regulated climate resulting from carbon capture and reduced carbon emissions, and increased rainfall and soil stability contributing to more reliable global food security. The Economic Value to the World (EVW) provided by Guyana's rainforests, if left untouched, has been estimated at a minimum of US$40 billion annually (OP 2010).

Given the economic and political evolution of the last two decades, capturing only a portion of this annual EVW would enable the government to fund reforms for improved education, health care as well as other essential services, while investing in low carbon hydro electric power. The challenge is to attract this investment from wealthier countries in the global community, continue

demonstrating to the Guyanese the benefit to be derived from adopting the LCDS is greater in the long run than the immediate monetary benefit of exploiting forest resources.

To help achieve this goal of low-carbon development, professional planners from Guyana's Central Housing & Planning Authority (CH&PA) partnered with the Canadian Institute of Planners between 2009 and 2012. The main goal of the Canada-Guyana partnership for Community Planning was "to build better planning practice capacity among public sector professionals and community leaders" (Horning et al 2010). In particular, the Partnership focused on the preparation of Community Development plans (CDP) as tools to link community priorities to broader government policies. Partnership activities included linking "Low Carbon Community Planning" to the high level National LCDS (Horning et al 2010).

In 2010, an International Conference on Low Carbon Development and Community Planning was held in Guyana with a theme of "Low Carbon Development and Community Planning." The conference explored "tangible ways the planning profession [can] implement Low Carbon Development generally and Guyana's LCDS specifically" (CIP 2010). In his keynote speech at the conference, Dr. Bharrat Jagdeo, the President of Guyana acknowledged the importance of planning in climate change action in the Caribbean—"No Caribbean country today can exclude from its planning process the huge challenges that are going to be posed by climate change" (CIP 2010). He called for adoption of "Low Carbon Planning," emphasizing the need for planners to collaborate in the multi-disciplinary challenges posed by climate change.

Dominica: Sustainable Land Management

Dominica is a mountainous island in the lesser Antilles with 365 rivers and streams. Presently, the country has an agriculture-based economy. However, development pressure is leading to changes in the use of land associated with residential, commercial and manufacturing needs.

Dominica is located in the hurricane belt, heightening its potential impacts of climate change including hurricanes, flooding and sea-level rise. As a country heavily dependent on agriculture, climate change and the temperature rises associated with it have the potential to negatively affect crop yield. Due in large part to its steep and rugged terrain, much of the urbanization on Dominica has occurred on the coast, with roughly 70 per cent of the population living in a narrow, low-lying coastal region.

Dominica's vulnerability to climate change results from this combination of a mountainous terrain and its location within the hurricane belt. Land degradation in combination with increased incidence and severity of hurricanes is expected to contribute to increases in the incidence and severity of landslides and flooding.

Historically, land in Dominica has been divided into large estates, either privately held, or owned by the State. These estates were subdivided and sold several decades ago, with the land intended primarily for housing. The 1995 Dominica Agricultural Census showed that ownership of these sub-divided land parcels was shifting from being single-owner to family-owned. Land degradation from unplanned housing development has resulted due to housing projects being "carried out with little attention paid to mitigating land degradation as formal regulatory

requirements are minimal or non-existent" (GoD 2012). In addition, landslides have in some cases been attributed to road construction and public works engineers not accounting for climate change risks. Land degradation has also resulted from inadequate forest management. Limited regulation and enforcement of forested areas results in increased risk of the forests being cut for fuel and construction, clearing the way for agricultural land or more housing.

Given the state of land use management and land degradation in Dominica, the Global Environment Facility (GEF), in partnership with the UNDP, launched the Sustainable Land Management (SLM) Project. GEF also works with the World Bank on the Special Program on Adaptation to Climate Change (SPACC). These two initiatives helped develop community vulnerability maps and adaptation plans for 11 Dominican communities. Alongside such initiatives, there has been strategic intervention to mitigate the impacts of climate change, including plans to better coordinate projects. Funding has come from the Caribbean Development Bank (CDB) with climate change funds tailored specifically for these projects. Expected outcomes include improved public awareness and knowledge, institutional capacity building, strengthened linkages between department and agencies and mainstreaming of climate change adaptation. Expected policies include effective land use zoning policies, watershed protection and management, coastal zone protection and management and a revised transportation network.

At a presentation at the third annual Caribbean Urban Forum in Trinidad and Tobago in March 2013, a representative from the Government of Dominica identified the need for new policy implementation strategies as the traditional land use planning top-down approach have not been effective. Climate change poses further complications. Planners are key as they focus on a more comprehensive and holistic approach as well as attempted to identify unintended consequences, along with those intended.

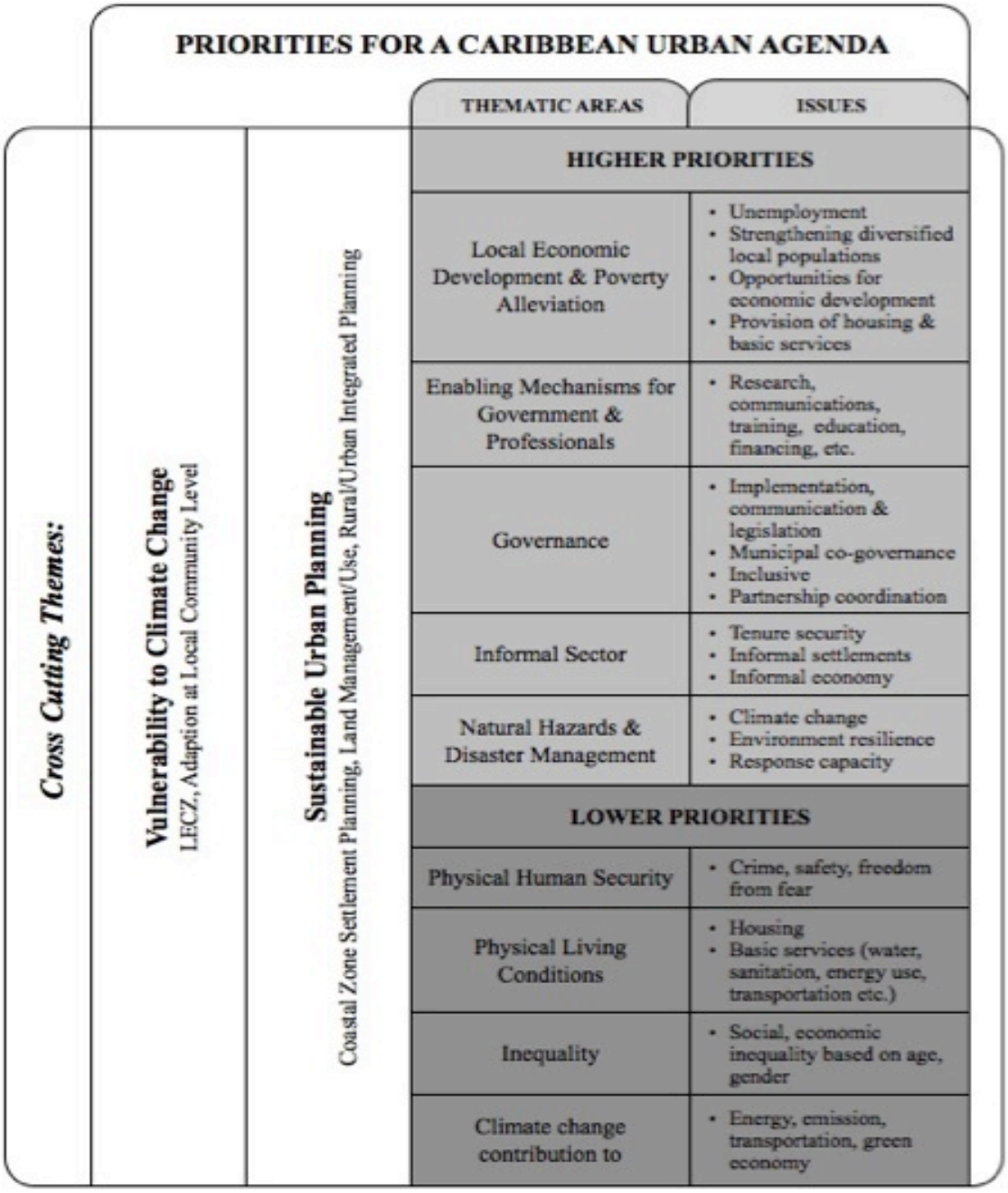
The Caribbean Urban Agenda and Caribbean Planners Association: Embracing the Future

The Caribbean faces several challenges to effectively combat climate change and the CPA should be viewed as an important tool to aid this effort. While municipalities and local government planners can address issues on a smaller scale, inter-regional efforts are also needed. The CPA can play a key role in mitigating and adapting to climate change by means of knowledge sharing among professionals and the promotion of best practices and professional certification, helping to offer a regional perspective to climate change and sustainable development. Helping to guide the CPA is the Caribbean Urban Agenda (CUA). Common practice in the Caribbean thus far has been for international initiatives to drive the urban agenda (Verrest, Hebe, A. Mohammed, S. Moorcroft, 2011). *Towards a Caribbean Urban Agenda*, a technical paper commissioned by the NSUS[7] conducted by CNULM is a locally developed guideline for addressing the growing urbanization in the Caribbean along with the developmental

7 The African Caribbean pacific Group of States (ACP) Science and Technology project entitled Strengthen research development and uptake capacity in Urban, Land and Municipal management in the Caribbean [NSUS network for the application of STI to the urban sector], referred to as the NSUS Project

agendas. The CUA has been reviewed by CARICOM and COTED and has been identified as having the potential to translate into policies to improve citizen outreach and the marketing of "planning as a socio-economic tool that is tied to physical planning (COTED 2012)." Climate Change and sustainable urban planning is a cross-cutting theme throughout the Agenda, which also fills a critical need for a regional perspective, prioritizing urban issues and challenges to promote healthy, liveable urban spaces. It also addresses unique aspects of the region that characterize the Caribbean urban landscape and acknowledges the reality that "processes of urbanization in the Caribbean transcend physical boundaries of the urban environment" (Verrest et al 2011). The CUA recognizes the importance and role of planning in mitigating and adapting to climate change, stressing that "adaptive strategies are high on the Caribbean Urban Agenda" (Verrest et al 2011). With support from the CPA and planners in the Caribbean, the CUA can set priorities in the Caribbean that can help strengthen the region's economic, social and environmental resiliency.

Figure 2 Priorities for a Caribbean Urban Agenda



The Caribbean Planners Association

The reality of the present-day Caribbean is one of urbanization, often unregulated and unplanned, compounded by the disruptive impacts of climate change. As the planning profession is an essential player in combating these impacts, planners around the world are assuming leading roles in sustainable development, hazard planning and planning for climate change. A need has been identified for a regional-scale planning association that can help support this role throughout the Caribbean, by providing an overarching Caribbean based planning perspective, as

well as strengthening institutional capacity and providing support to planning professionals. Having been discussed and attempted for decades, the Caribbean Planners Association again caught traction at the First Annual Caribbean Urban Forum in 2011 in Georgetown, Guyana. A fundamental difference this time is the slow but steady acceptance of professional planning as a foundation for a safe future and high quality of life. Further bolstering this effort is growing support from international partners such as the American Planning Association, the Canadian Institute of Planners, the Commonwealth Association of Planners, and the Lincoln Institute for Land Policy. Specifically, the CPA is "a regional planning body that advocates for securing, as a benefit to all generations, the creation of healthy, sustainable and liveable communities" (Caribbean Planners Association Business Plan 2012). By supporting the planning profession, the CPA directly addresses climate change and promotes urban planning through:

- Sharing information and promoting best practices
- Delivering professional development and continuous professional learning
- Supporting professional certification and post-secondary quality assurance
- Undertaking public advocacy at a regional scale

The CPA seeks to "establish strong Caribbean professional institutional capacity, strengthen professional recognition, knowledge exchange and professional development, and change level of knowledge and attitudes among governments and dynamic Caribbean industries regarding urban priorities" (Caribbean Planners Association Business Plan 2012). By highlighting the important role of planning in the Caribbean climate change strategies, an element that now must be woven into all planning and development policies, the CPA can establish itself as a credible planning body that can speak on behalf of Caribbean planners and raise awareness towards climate change adaptation and mitigation planning throughout the Caribbean.

Conclusion

The Caribbean is faced with imminent challenges resulting from global climate change, including sea-level rise, increased intensity and frequency of debilitating weather events. Coupled with rapid urbanization, poorly planned and unregulated development along Caribbean coastlines is endangering millions of people, businesses and homes. These dense coastal settlement patterns, as well as limited access and planning capacity pose significant challenges to Caribbean-based planners. This framework highlights the importance of the establishment of a regional planning body as an independent and credible voice on critical issues facing the Caribbean. While there are currently efforts being implemented throughout the Caribbean, specifically focused on mitigating climate change, the CPA can act as a resource allowing techniques and lessons learned can be shared, improved and potentially replicated throughout the region. The inevitable impacts with which climate change will alter life in the Caribbean demand a collective and unified effort. The diversity of the Caribbean will also yield innovative solutions and approaches to addressing these impacts. The CPA can offer a much needed regional voice for the hundreds of Caribbean based planners working on Caribbean-specific challenges. Climate change does not have boundaries and there is a great need for inter-Caribbean initiatives and countries to coordinate climate change efforts and share their experiences. By promoting information sharing and knowledge exchanges as well as strengthening professional planning

practice as a means to addressing climate change, the CPA can have a meaningful contribution to ensuring climate-resilience in a highly vulnerable part of the world.

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