The Silent Tsunami

There has been a plethora of activity over the last decade in adapting to climate change as far as the member states of the Caribbean Community are concerned, but nonetheless for this especially vulnerable area, there is still an under-addressed crisis underway

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Climate scientists have concluded that the earth is warming primarily as a result of human activity, and that, consequently, the most colossal environmental disturbance in modern history is underway. Since the Industrial Revolution, ever increasing concentrations of carbon dioxide, methane, nitrous oxide, and other potent greenhouse gases are being emitted into the atmosphere by deforestation and the burning of fossil fuels. These gases are slowly but surely altering cycles of matter and life, and interfering with the earth's natural cooling processes. Melting sea ice, permafrost, and mountain glaciers are just the first relatively mild visible symptoms of what has resulted from this disruption of planetary energy and chemistry balances. Climate scientists have identified other manifestations of global warming, which include but are not limited to the salinization of freshwater resources, increasing sea and surface temperatures, frequent extreme weather events, changes in precipitation patterns, ocean acidification, and deforestation and forest degradation. One threat peculiar to billions of people in low-lying areas, in addition to the above, is measured in millimeters per year but is becoming a greater danger. The ever increasing levels of the world's oceans constitute a silent tsunami taking place across the globe.

One of the areas that is quietly experiencing a heavy toll as a result of this flood of accretion is the Caribbean. Some 60 percent of the Caribbean population lives within 1.5 kilometers of the coast, which makes them susceptible to the threats of climate change, such as salt water intrusion; deteriorating coastal conditions through beach erosion and coral bleaching, which adversely affect local natural resources and reduce their value as tourist attractions; and, finally, floods, storm surge, erosion, and other coastal hazards, exacerbated by sea level rise that threatens vital infrastructure, settlements, and facilities that support the livelihoods of island communities.

Although this subregion contributes less than one percent of global greenhouse gas emissions, the Caribbean is likely to suffer disproportionate impacts. Thus, the focus for these low-lying countries must be on adaptation to climate change, with mitigation as a supporting mechanism. The question, however, is, faced with the enormousness of the threats and challenges posed by global climate change, how effective have Caribbean policymakers been with respect to developing policies and implementing measures to reduce the vulnerability of nature and the human environment against the actual or expected climate change effects these countries will experience?

In the summer 2011 report entitled "The Economics of Climate Change in the Caribbean," the United Nations Economic Commission for Latin America and the Caribbean examined the economic impacts of climate change on agriculture, transportation, energy, the coastal and marine

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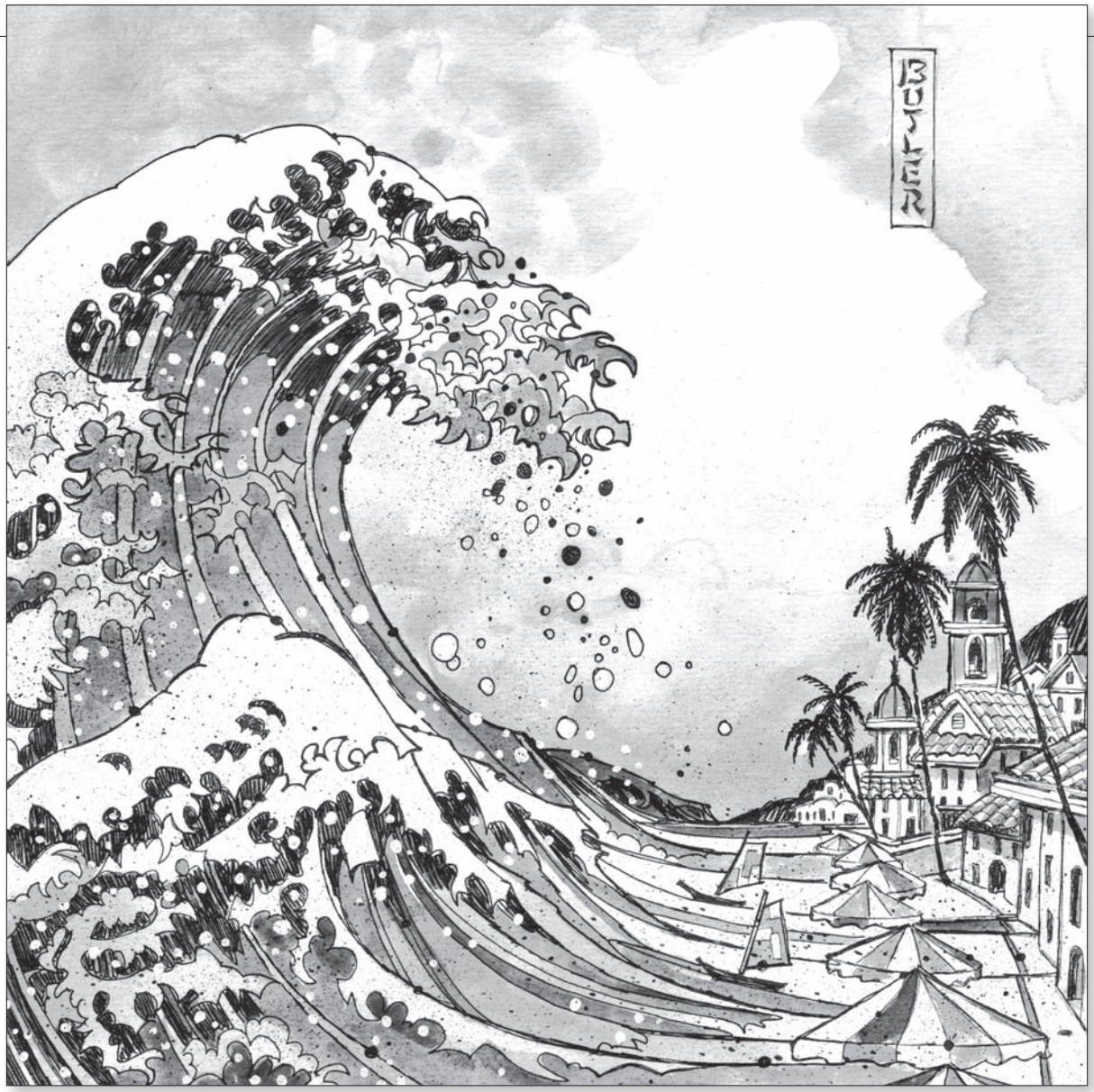

environment, human health, and tourism. The ECLAC report concluded that, for these small island developing states, known as SIDS, the threat of climate change is even more severe due to the biophysical and socioeconomic characteristics of these countries that make them especially vulnerable. This is a result of the geographic locations of these SIDs in the hurricane belt, and the concentrations of their populations and economic infrastructure in coastal zones. Moreover, the subregion is dependent on a narrow range of economic activities, primarily agriculture and tourism, which are especially affected.

With respect to tourism, the ECLAC report pointed out that the industry contributes significantly to the economies of these SIDs, particularly in terms of its impacts on employment and foreign exchange earnings. For some Caribbean countries, tourism is the single most important sector of the economy. The World Travel and Tourism Council has described the Caribbean as "the most tourism-intensive region of the world." The council estimated in 2011 that the direct contribution of the tourism sector to the Caribbean GDP was $15 billion (4.6 percent of total GDP). The 2011 GDP figure was almost 50 percent above the world average.

It has been said that "weather can ruin a holiday but climate change can ruin a destination." The Caribbean tourism sector, according to the ECLAC report, is expected to be adversely affected by an overall deterioration in the attractiveness of island destinations due to climate change, which is expected to result in a fall-off in arrivals. Additional land loss due to sea-level rise, and the deterioration of the tourism product due to coral reef loss, are expected. Estimated losses range from $111.5 million in Montserrat (5.2 times 2009 GDP) to $19 billion in the Bahamas (2.8 times 2008 GDP) over the 2011–50 period. For Barbados, when impacts of mitigation strategies on tourists are taken into account, total losses are estimated at approximately $7.4 billion over the same period.

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It is axiomatic that the sun, sea, and sand have attracted tourists to the Caribbean for generations. Unfortunately, coastal and marine resources are being adversely affected by climate change. The rich ecology and the biodiversity of the subregion that the island communities and the tourists take for granted are being severely impacted. The ecology and biodiversity includes wetlands, mangroves, coral reefs, beach systems, seagrasses, coastal lagoons, estuaries, keys and inlets, bioluminescent bays, fisheries, marine mammals and reptiles, amphibians, forests, and wildlife generally.

There are a number of organizations that have been closely examining the adverse impacts of climate change on the Caribbean. One of the principal organizations is the Caribbean Community Climate Change Center that is located in Belmopan, Belize, which has been operational since 2004. In 2002, the CARICOM heads of government (the states include Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Suriname, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, and Trinidad and Tobago) endorsed the concept of the center, whose mandate is to coordinate the regional intergovernmental response to climate change, and to assist the region in adapting to its projected impacts.

The center has developed the 2011–15 Caribbean Regional Resilience Development Implementation Plan. The IP is an ambitious effort, since the center realizes that there have been insufficient coordinating arrangements to actualize the IP, and to bring about transformational change and advocacy to ensure that CARICOM heads of government plan and allocate resources for adaptation measures. To do so they must overcome inadequate managing of coastal and marine resources; insufficient fact-based and evidence-based work to strengthen the region's negotiating position; and insufficient national and regional level climate architecture to secure climate change adaptation financing. The objectives of the IP, therefore, are to expand knowledge and capacities through evidence-based adaptation initiatives, and strengthen institutions for greater climate security; increase the delivery of adaptation programs in a range of key vulnerable sectors that are critical for sustained livelihoods of island communities; and support an effective national, regional, and international climate architecture to secure adaptation financing.

The IP builds on previous initiatives aimed at developing and strengthening the regional response to climate change. For example, from 1997–2001, the Caribbean Planning for Adaptation to Climate Change initiative focused, among other things, on designing and installing a sea-level and climate monitoring system, monitoring the impacts of climate change on coral reefs, developing a coastal vulnerability assessment, and inventorying the coastal resources and uses of the islands. From 2001–04, the Adaptation to Climate Change in the Caribbean Initiative focused, among other things, on developing a guide to assist practitioners in CARICOM countries to integrate climate change in the environmental impact assessment process and developing a draft regional public education and outreach strategy. From 2004–09, another measure, the Mainstreaming Approach to Climate Change initiative, focused, among other things, on preparing adaptation strategies, engaging in pilot vulnerability assessments, and strengthening the region's monitoring network. And, finally, from 2007–11, the Special Pilot Adaptation to Climate Change initiative supported the efforts of Dominica, St. Lucia, and St. Vincent and the Grenadines to implement specific pilot adaptation measures to address the impacts of climate change on biodiversity and land degradation management.

There were a number of truly innovative pilot projects. One examined the implementation of selected adaptation measures in seven sites in the participating countries to enhance the resilience of insular ecosystems under threat from climate change and land degradation. Another notable project was to develop "climate proof" building codes for St. Lucia by considering the impact of global warming on the intensity and frequency of hurricanes. Consequently, the planned retrofitting of the Marchand Community Center in Castries, St. Lucia, was redesigned. The center serves as the hurricane shelter for residents in that area, and as a telecommunication center for the National Emergency Management Organization. Finally, there was a pilot project in Bequia, St. Vincent and the Grenadines, that demonstrated the feasibility of a carbon-neutral desalination system. The project took advantage of the island's sunshine to provide solar power to operate a potable water system. The drinking water was provided for the fishing and whaling community of Paget Farms on Bequia, which is the largest island of St. Vincent and the Grenadines.

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There has been a plethora of activity over the last decade in adapting to climate change, as far as the member states of the CARICOM are concerned. Recently, Puerto Rico and the U.S. Virgin Islands have become more engaged in the climate change dialogue in the Caribbean subregion. In November 2011, I participated in the first climate change conference convened in Puerto Rico. The U.S. Environmental Protection Agency was the catalyst for the conference, "Climate Change in the Caribbean 2011: Puerto Rico and the U.S. Virgin Islands." Judith Enck, EPA's Region 2 administrator, provided the Inter-American University of Puerto Rico School of Law audience with spirited opening remarks. She stated, "The effects of climate change on Puerto Rico and the other Caribbean islands will be severe if we don't take action." She pointed out that, as the composition of the atmosphere changes, the Atlantic Ocean and Caribbean Sea will become more acidic, unbalancing the ecosystem. The coral reefs that are such an important part of that ecosystem will be threatened. There will be adverse impacts on coastal infrastructure. There will be coastal erosion and more frequent flooding. Industries such as fishing, agriculture, and tourism that depend on the environment will suffer. And, there will also be immediate, negative effects on public health in that heat waves will be more frequent and severe, which, in turn, will present a serious health threat to those with heart problems or asthma, as well as the homeless and the elderly.

She further stated that, based on the information shared at the conference, "You will have the information you need to take action." Her remarks, in many respects, were a call to arms in that she stated "now was the time" to develop a new source of clean, renewable energy with solar panels and wind farms; to address the islands' high energy costs by initiating a massive effort to promote energy efficiency; and to invest in mass transit, since the island has too many cars and, at the same time, has the highest rate of asthma in the nation. She ended her remarks by emphasizing that "if banks are too big to fail, then our planet should be too big to fail, too."

Like so many islands in the Caribbean subregion, tourism is a major part of the Puerto Rican economy, and the concentration of the population and the economic infrastructure are in the coastal zone. According to the Puerto Rican Planning Board, the population of the territory is 3.9 million, and 70 percent live in the coastal zone. In fiscal year 2005, GDP was $56.5 billion, and tourism accounted for $4.1 billion. There were 12,900 hotel rooms in Puerto Rico; 10,292,000 people used the San Juan International Airport; and 1,350,000 tourists arrived by cruise ship in San Juan, which is the largest home port for cruise ships in the Caribbean. However, the number of persons registered in tourist hotels during fiscal year 2008 was 1,737,580, a decrease of 3.1 percent over the number of persons registered the previous year. Almost 90 percent of the tourists visiting Puerto Rico come from the United States, and there has been a steady decline in tourism each fiscal year. This problem could be exacerbated further by climate change.

It should be noted that the tourism industry is also a major contributor to global warming. In 2005, for example, according to the Center for Sustainable Tourism of East Carolina University, the worldwide tourism sector contributed 5.0 percent of total emissions, making it a more important contributor than India, Japan, or Germany. The industry has begun to develop significant mitigation and adaptation solutions to climate change because, according to Fiona Jeffery, chairperson of the World Travel Market, "Collectively and individually, the tourism industry can no longer afford to ignore climate change."

The Center for Sustainable Tourism gave a presentation at the 2011 conference in San Juan that highlighted some of the industry's mitigation and adaptation solutions. The mission of the center is to transform the industry in its adoption and application of sustainable actions for positive economic growth and general business and community development. Among other things, the center emphasizes why sustainability in tourism needs to be vigorously pursued as a result of the following: the growing recognition of the "negative footprint" of tourism; the need to decrease costs and improve profits; the need to create green brand recognition; the need to enhance business and destination reputation; the need to increase market share by responding to consumer demand; the need to increase employee loyalty and cost savings on training; the need to enhance relationships and to comply with regulations; and, finally, the need to contribute to the well-being of the community in which the business operates. The Caribe Hilton of San Juan and the Bahia Beach Resort and Golf Club were two hotels who participated in the climate change conference, and have fully embraced and implemented the concept of sustainability in tourism in Puerto Rico.

The CARICOM Climate Change Center is also examining the tourism sector in its 2009–12 Car-

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bon Neutral Tourism Program. The program consists of the following components: an assessment of the carbon footprint of the tourism sector and evaluation of appropriate approaches and technologies to reduce the footprint; identification and development of financing mechanisms to establish carbon neutrality for the tourism sector; and preparation of a program to access available climate financing for integrating climate resilience within the tourism sector. The Bahamas, Belize, Guyana, and Trinidad and Tobago are the countries that have been used as pilot sites for the program.

In addition to the adaptation efforts of the tourism industry, the work of the CARICOM center, and a few progressive-thinking hotels, government policymakers in the Caribbean subregion need to be more effective in developing adaptation strategies within the context of national and subregional policies and plans to address the serious threat to sustainable human development, ecosystems, health, and the economic infrastructure of these small island developing states.

A 2011 report by the Economic Commission for Latin America and the Caribbean offers some sound recommendations for the policymakers to consider. With respect to mainstreaming sustainable adaptive strategies into national and subregional policies, ECLAC recommended that the policymakers should consider developing a strategy geared toward transborder and multinational conservation of biodiversity across the subregion; mainstreaming of coastal zone management policies with other relevant policies such as water resource management; and mainstreaming climate change and disaster risk reduction in development planning. With respect to monitoring the socioeconomic impacts of climate change in the short and long term, ECLAC found that there is a need to develop quantitative and qualitative methods of evaluating the costs of climate change, as well as adaptive capacity, and there is a need to invest in activities that directly protect the productive sectors, including the building of sea walls and other sea defense mechanisms, the relocation of agricultural production to less sensitive locations, the development of salt-tolerant crop varieties, the establishment of systems of food storage, and the establishment of early warning systems.

With respect to reducing the impact of extreme weather events, ECLAC recommended that the policymakers consider integrating disaster preparedness and response into poverty reduction strategies, and to raise public awareness of the potential risks involved and sensitize populations about the role that they can play in reducing the impact of extreme events, including the relocation of communities. Finally, ECLAC recommended that policymakers must become more engaged in developing fiscal policies that address climate change by, among other things, providing incentives for the design and renovation of settlements and homes that conform to revised building codes which will make them more resistant to extreme weather events, and focusing on activities that increase capital formation, raise the quality, diversity and quantity of exports, and raise the technical capacity and knowledge of the work force. The policies recommended by ECLAC are broad and quite comprehensive, and should be seriously considered by the policymakers of these islands.

But, more importantly, the lessons learned from the adaptation pilot projects and the various initiatives must be replicated in other countries throughout the Caribbean subregion. The adaptation pilot projects offer, arguably, the best method for sharing information and data that could assist CARICOM heads of government, as well as the political leadership in Puerto Rico and the U.S. Virgin Islands, in sound decisionmaking. Policymakers must continue to develop regional intergovernmental policies and strategies, encompassing dialogue, institutional strengthening, and demonstration activities.

The climate science community has advised the political leadership in the Caribbean subregion that global climate change is, arguably, the most serious challenge facing them. Without a doubt, during the 20th century, the Caribbean mean temperature increased by 0.6 degrees Celsius, the mean sea-level rose between 2 and 6 millimeters per year during the period, and rainfall variability has increased significantly. In short, there is a silent tsunami taking place in the Caribbean subregion, since the warming of the earth's climate system is unequivocal. And, since a majority of the Caribbean population lives within a mile of the coast, in the words of EPA regional administrator Enck, "The effects of climate change on Puerto Rico and other Caribbean islands will be severe if we don't take action."

Climate change adaptation will be neither cheap nor easy. But the costs and complexities of the adaptation challenge pale in comparison with the risks and costs that are likely to accompany failure to take decisive action. •

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