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GET UP, STAND UP: ENVIRONMENTAL SITUATION, THREATS, AND OPPORTUNITIES IN THE INSULAR CARIBBEAN

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*Get up, stand up: stand up for your rights!
Get up, stand up: don't give up the fight!
Get up, stand up: stand up for your rights!
Get up, stand up: don't give up the fight!*

Excerpted lyrics from the song
Get Up, Stand Up,
by Bob Marley and Peter Tosh

The meaning of these lyrics can be interpreted in many ways, but they certainly advocate for taking action. Every individual has the right to a basic standard of living and to live within sustainable human, social, economic, and environmental conditions. *Getting up and standing up* to demand and reach such conditions will promote human development, which in turn gives way to sustainable development, and facilitates safe guarding the environment. This Special Issue addresses different aspects regarding the environmental conditions of the islands that compose the insular Caribbean (Figure 1); the threats that these conditions pose to the region's inhabitants, and also possible opportunities and actions that can be taken to overcome such threats, to reach a balance between environmental and human systems, and to integrate these systems and their particular perspectives to management at various scales.

As a region, different factors unify and define the insular Caribbean. On the one hand, the region can be geographically defined as the islands which meet the Caribbean Sea¹ and which lie in a position within the tropics (except for the northern Bahamas), which contributes to regional environmental conditions such as exposure to similar types of natural hazards, rainfall distribution, water availability, and potential impacts of climate change. On the other hand, the region can be defined by common histories of decimation of indigenous peoples, colonialism, slavery and sugar cane plantation in their earlier economies, with more recent trends of changing population dynamics and high levels

Figure 1. The insular Caribbean.

of urbanization (Boswell 2009; Levine 1981). Within abandoned agricultural lands and green spaces in urbanized areas the combination of historically introduced and native plants continue to maintain, and in some cases increase, the region's high plant diversity (Lugo *et al.* 2012). Histories of dependencies, demographic trends and resource use are elements that can influence the way people resist, cope, adapt to, and manage current environmental conditions within the region. Global change, including environmental change and economic globalization, also influences people's vulnerability in a variety of ways and is expected to have major impacts on social, human, economic, and environmental systems (Barker *et al.* 2009). Global change can also complicate environmental management and development due to uncertainty and surprises associated to potential climate change.

Beyond the similarities in geographical, historical, and demographic terms, there are many factors that differ and vary within the region— islands with varying sizes, geologic formations and topographical conditions. Also, there is variety in terms of countries' political systems and ideologies, political status, social transformations, economic structure and linkages, ethnicity, cultural background, and linguistic differences, among others (Skelton 2004). This "carnival of abundance" (Levine 1981:275) makes the region rich, diverse, and complex.

Such differences can influence environmental management efforts at local and regional levels in many ways. Differences in language, for

example, can become a barrier in terms of collaboration among Caribbean countries. In terms of the number of islands, English is the most widely spoken language in insular Caribbean, followed by Spanish, Dutch and French (Table 1). In terms of numbers of people speaking a specific language, however, there are more Spanish speakers, followed

Table 1. Languages spoken in the insular Caribbean.

| Island, Country or Territory | 2012 population | Language* | | | | | | | | | |
|------------------------------|-----------------|-----------|---------|----------------------|-------|--------|-----------------------|------------|---------|------------|-------|
| | | English | Spanish | French Creole/Patois | Dutch | French | English Creole/Patois | Papiamentu | Chinese | Hindustani | Other |
| Anguilla | 15,423 | * | | | | | | | | | |
| Antigua and Barbuda | 89,018 | * | | | | | * | | | | |
| Aruba | 107,635 | * | * | | * | | | * | | | |
| Bahamas | 316,182 | * | | | | | * | | | | |
| Barbados | 287,733 | * | | | | | | | | | |
| Bonaire | 16,541 | * | * | | * | | | * | | | |
| Cayman Islands | 52,560 | * | * | | | | | | | | |
| Cuba | 11,075,244 | | * | | | | | | | | |
| Curaçao | 145,834 | * | * | | * | | | * | | | |
| Dominica | 73,126 | * | | * | | | | | | | * |
| Dominican Republic | 10,088,598 | | * | * | | | | | | | |
| Grenada | 109,011 | * | | | | | * | | | | |
| Guadeloupe | 465,000 | | | * | | * | | | | | |
| Haiti | 9,801,664 | | | * | | * | | | | | |
| Jamaica | 2,889,187 | * | | | | | * | | | | |
| Martinique | 408,000 | | | * | | * | | | | | |
| Montserrat | 5,164 | * | | | | | | | | | |
| Puerto Rico | 3,690,923 | * | * | | | | | | | | |
| Saba | 1,971 | * | | | * | | | | | | |
| Sint Eustatius | 3,791 | * | | | * | | | | | | |
| St. Kitts and Nevis | 50,726 | * | | | | | | | | | |
| St. Lucia | 162,178 | * | | * | | | | | | | |
| Sint Maarten | 46,785 | * | | | * | | | | | | |
| St. Martin | 30,956 | | | * | | * | | | | | |

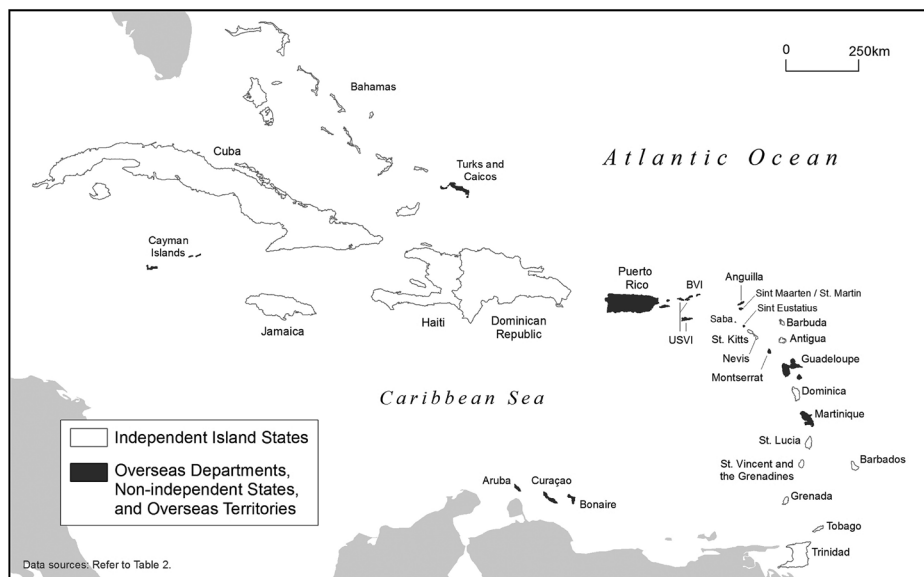
Table 1 continued.

| Island, Country or Territory | 2012 population | Language* | | | | | | | | | |
|--------------------------------|-----------------|-----------|---------|----------------------|-------|--------|-----------------------|------------|---------|------------|-------|
| | | English | Spanish | French Creole/Patois | Dutch | French | English Creole/Patois | Papiamentu | Chinese | Hindustani | Other |
| St. Vincent and the Grenadines | 103,537 | * | | * | | | | | | | * |
| Trinidad and Tobago | 126,383 | * | * | | | * | | | * | * | |
| Turks and Caicos | 46,335 | * | | | | | | | | | |
| Virgin Islands (UK) | 31,148 | * | | | | | | | | | |
| Virgin Islands (US) | 105,275 | * | * | | | | * | | | | |

Data source for population and language spoken: The World Factbook <<https://www.cia.gov/library/publications/the-world-factbook>>. Population for Bonaire, Saba, and Sint Eustatius is from the Netherlands Government – Central Bureau of Statistics, population for Guadeloupe and Martinique is from the Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT).

*Languages are generalized for simplicity of review. Note that English includes standard British and American, French-related and English-related Creole and Patois are classified together for simplification but these are different per individual islands. Other includes indigenous Caribbean languages and Garifuna.

by French-, English- and Dutch-speakers.² Another example of differences in the Caribbean is country political status and independence. The Caribbean is among the sites with the largest number of non-independent states in the world (Skelton 2004:5), with about half being independent states and the rest of the territories having some type of dependence status (Figure 2). In terms of government types, the range is large in the insular Caribbean. Islands span from Cuba, a republic that is communist state, to a suite of commonwealth nations (e.g., St. Lucia, Barbados), to overseas collectivities and the overseas regions and departments (e.g., Guadeloupe and Martinique, and St. Martin and St. Barthelemy which are all part of France, and the many territories of the United Kingdom—Anguilla, British Virgin Islands, Cayman Islands, Montserrat). There is also the status of what was commonly referred to in the past as the “Dutch or Netherlands Antilles,” which are part the Netherlands. There are four countries that constitute the Kingdom of the Netherlands (Aruba, Curaçao, Sint Maarten, and Netherlands), and within the Netherlands are the island provinces of Saba, St. Eustatius and Bonaire. Countries’ independence status and political system influence,

Figure 2. Political status in the insular Caribbean.

for example, participation, partnership and cooperation in regional development efforts and environmental initiatives (Table 2).

We argue, however, that existing differences can also be beneficial and advance environmental management and decrease vulnerabilities at different scales. Diversity is one of the elements that supports resilient socio-ecological systems (see, for example, Adger *et al.* 2005; Berkes 2007; Folke *et al.* 2002)—diversity in terms of world view, knowledge, experiences, management options, practices, institutions, stakeholders, partnerships, among others. The diversity in the region, in elements ranging from government to culture, as previously mentioned, results in different ways of thinking about and managing the environment. This diversity can include different opinions, options, practices, and behaviors to tackle environmental issues. The important piece here is to identify lessons learned, share successful stories and what has permitted positive outcomes, while also sharing those less successful stories and associated barriers that need to be overcome in order to promote best practices and management at different scales.

To exemplify this diversity, this special issue opens with López-Marrero and coauthors cartographic essay, which reshapes the spatial configuration of the insular Caribbean. In this contribution, a strikingly different view of the region emerges when themes of population, gross domestic product, and environmental topics are mapped with the use of cartograms, thus challenging our pre-set views and perspectives of the

Table 2. Membership of Caribbean islands in selected regional initiatives and organizations.

| Island, Country or Territory | CARICOM | OECS | CDEMA | CIMH | OAS | UN |
|--|---------|------|-------|------|-----|----|
| Anguilla ⁴ | | * | * | * | | |
| Antigua and Barbuda | * | * | * | * | * | * |
| Aruba ² | | | | | | |
| Bahamas | * | | * | | * | * |
| Barbados | * | | * | * | * | * |
| Bonaire ² | | | | | | |
| Cayman Islands ⁴ | | | | * | | |
| Cuba | | | | | * | * |
| Curaçao ² | | | | | | |
| Dominica | * | * | * | * | * | * |
| Dominican Republic | | | | | * | * |
| Grenada | * | * | * | * | * | * |
| Guadeloupe ¹ | | | | | | |
| Haiti | * | | * | | * | * |
| Jamaica | * | | * | * | * | |
| Martinique ¹ | | | | | | |
| Montserrat ⁴ | * | * | * | * | | |
| Saint Martin, ¹ Sint Maarten ² | | | | | | |
| Puerto Rico ³ | | | | | | |
| Saba, St. Eustatius ² | | | | | | |
| St. Kitts and Nevis | * | * | * | * | * | * |
| St. Lucia | * | * | * | * | * | * |
| St. Vincent and the Grenadines | * | * | * | * | * | * |
| Trinidad and Tobago | * | | * | * | * | * |
| Turks and Caicos ⁴ | | | * | * | | |

Table 2 continued.

| Island, Country or Territory | CARICOM | OECS | CDEMA | CIMH | OAS | UN |
|----------------------------------|---------|------|-------|------|-----|----|
| Virgin Islands (UK) ⁴ | | * | * | * | | |
| Virgin Island (US) ³ | | | | | | |

Data sources: Caribbean Community (CARICOM): <<http://www.caricom.org>>

Organization of Eastern Caribbean States (OECS): <<http://www.oecs.org/about-the-oecs/member-states>>

Caribbean Disaster Emergency Management Agency (CDEMA) <<http://www.cdema.org/>>

Caribbean Institute for Meteorology and Hydrology (CIMH): <<http://www.cimh.edu.bb/>>

Organization of American States (OAS): <http://www.oas.org/en/member_states/default.asp>

These islands, either departments or overseas territories, are represented by their respective collective countries in the United Nations: 1. Islands part of France, 2.

Kingdom of the Netherlands, 3. United States of America, 4. United Kingdom.

United Nations (UN): <<http://www.un.org/en/members/#d>>

region. The cartographic technique “re-shapes” the islands allowing for unique comparisons among topics and islands mapped. This is certainly, for instance, the case of the CO₂ cartogram, where islands almost invisible in regular scaled maps (Caiman Islands, U.S. Virgin Islands and Curacao) come to the forefront as their emissions make them stand out in the regional context. We invite our readers to study these cartograms as both a stand-alone contribution to this special issue, but also as a way to provide new perspective and insight to the rest of the environmental topics that are presented in the subsequent articles.

In addition to the cartographic essay, this Special Issue brings together the following topics: agriculture, freshwater resources, fisheries, natural hazards and disasters, and climate change. Each article provides a general overview of the topics at the regional level, and some also provide a description at the country level. Problems and challenges are discussed within the context of each theme. In each of the articles, the authors identify opportunities and provide recommendation and practical interventions to tackle such problems and challenges, to decrease people’s vulnerabilities and increase resilience, and to promote sustainable management and use of resources within the region.

Agriculture trends in the insular Caribbean are analyzed by Barker. He discusses the vulnerabilities of current agricultural sector, identifying threats to agriculture from economic, political and environmental degradation of agricultural lands. The lack of capacity of the agricultural sector to recover from climatic events is presented and discussed in

terms of opportunities that have not been taken to broaden resilience and adaptation in the face of impending changing regional climate and globalization. Baker suggests coping strategies regarding the agricultural sector to ameliorate changing climate regimes and sea level rise, which includes increasing variety of crops produced and securing farming lands. Niche crops, fair trade, and local market consumption are also identified as opportunities yet to be further explored in the region.

Heartsill Scalley presents a description of the contrasting capacity of islands to store, deliver and manage freshwater resources. She points out that the freshwater needs of the increasingly urbanizing Caribbean are those related to management and treatment of residual and used waters. Without proper management of pluvial water there are negative impacts upon coastal systems, and these can negatively affect coastal resources and livelihoods (including fisheries and tourism). In a parallel way, without investment and management of waste waters and sewage, urbanized areas have eminent threats of disease outbreaks and the contamination of reservoirs, wetlands and coastal areas. This urban situation is in contrast to the needs of rural communities, where access to freshwater and potable water resources is still lagging. Access to potable water remains an issue to address for improving basic human health and safety needs in many rural areas of the insular Caribbean. The article also points out the opportunities that will arise with forward thinking in areas such as waste water management and careful reuse of residual and agricultural irrigation waters in many areas, in tandem providing improvement and more opportunities to the agricultural sector.

When reviewing the conditions of fisheries, the research review of Valdés-Pizzini, García-Quijano and Schärer-Umpierre suggests plainly that things cannot continue the way they have been if true advancing of natural resources management and safe guarding of coastal resources is to be achieved. Their article demonstrates how the way forward is integration of social and human dimension in fisheries management, which has not been the practice in the region where traditional “counts of catch per effort” have been the norm. Valdés-Pizzini and co-authors provide clear examples of the type of integrative work that needs to happen at local levels, such as identifying and involving resource users at various scales in the process of achieving greater environmental knowledge for empowerment that can then lead to effective governance. This is also present in the review of freshwater systems by Heartsill Scalley, where, in her assessment, she highlights the need to connect management of systems in the higher watersheds lands to those of the lowland coasts where fisheries systems are. In this view, both articles call attention to aspects of integration of human dimension in developing effective environmental management practices and engaging resource user in greater

awareness and knowledge of the environment. Another interesting, but challenging aspect presented in common to fisheries and freshwater is the need to consider the concept of *carrying capacity* for the environmental systems that support and provide these resources. In closing, a call to more culturally sensible approaches to management is made, not only by pointing out the need for more inclusiveness in decision-making processes, but also in making laws, regulations and initiatives pertaining to these resources cultural sound and sensitive.

López-Marrero and Wisner summarize the occurrence of disasters with a natural trigger within the region and discuss these trends in terms of the determinants of vulnerability, specifically the social and human conditions of the exposed populations that put people at risk and determine disaster outcomes. The authors also provide examples of the capacities and resources people in the region have drawn from to deal with hazard exposure, particularly at the local level. They provide recommendations to increase personal and social protection and resilience in the face of current and future hazard impacts at the regional, country, and local level. In the end, the authors call to the attention that reducing vulnerabilities and enhancing capacities and risk management requires, in many instances, rethinking current strategies and management practices.

Regional climate and predicted climate change scenarios are presented in connection to Caribbean lifestyle, agricultural, and tourism cycles by Taylor and coauthors, beginning with the geographic characteristics that create the particular climate sensitivity situation for the islands in the region. Their review begins by pointing out how water storage and availability is driven by the region's climate, and continues on to link the constraints that climate change introduces to regional development. The main factors that threaten the insular Caribbean are changes in precipitation regimes/seasonality, warmer temperature, and sea level rise. Changes in precipitation regime, for example, mean both more droughts and more intense storms, making the agricultural sector in particular one of the most vulnerable if adaptation strategies are not continuously being sought and implemented. Through clear descriptions of prevailing and predicted climate, the connections to economic development are presented in light of current trends in specific sectors such as agriculture and tourism and actions to mitigate are clearly described. Taylor and coauthors also point out that in seeking further enhancement of resilient Caribbean environmental, social and economic systems, within the scenario of climate change, emission reductions and investments in alternative energy systems will need to be part of all sustainable initiatives.

Current assessments of the insular Caribbean's environmental

situation also point out many opportunities to establish the region in a direction towards sustainable development. Investment in capacity building and training of new generations to be able to engage decision-making processes at all levels is an essential step for a sustainable Caribbean. Further, integrating stakeholders, managers and decision makers is a way to sound environmental management. The clear calls to action to build capacities in anticipation of changes related to regional climate are delineated in both Taylor and coauthors and in López-Marrero and Wisner. Evidence-based action is one of the many insightful recommendations by the authors on both articles to create capacities to adapt and prepare for eventual changes in the region should be heeded. As stated by Pacala and coauthors (2003:1187) “many predictions of possible environmental degradation will not come to pass in some cases simply because these predictions were made” and therefore actions were taken. We cannot afford, for instance, indifference to the situation of water policies in the region in light of the predicted changes in regional climate (Cashman 2012).

In sum, there is a need to bring forward as a region what we can learn from each other; what can be replicated in different parts of the region and beyond; and in particular, make accessible different recommendations and further actions that could be taken to move forward in terms of environmental management, vulnerability reduction, and resilience enhancement. Here the role of research and accessible results is crucial. In addition, identifying and proposing practical interventions at different scales and bridging the gap between academic research and practical policy is imperative for reducing vulnerability and increasing resilience (Dodman *et al.* 2009).

*So now you see the light, eh!
Stand up for your rights, come on!*

Excerpted lyrics from the song
Get Up, Stand Up,
by Bob Marley and Peter Tosh

As we discuss in the beginning of the introduction to this Special Issue, the current understanding of the environmental situation in the insular Caribbean comes backed with basic data and research that can delineate many initiatives to promote resilience and adaptation. By bringing to the forefront the varied aspects of current environmental conditions of the islands of the insular Caribbean the threats are identified, and therefore the opportunities and actions to be taken can be more clearly addressed. With the goal of sustaining in parallel both environmental and human systems, the Caribbean can *get up and stand up* in its own right.

Notes

1. The geographic extent of the Caribbean region has been defined in different ways, including just the islands within the Caribbean Sea, to the inclusion of continental land masses of North, Central, and South America which meets the Caribbean Sea (see, for example, Boswell 2009 and Skelton 2004). In this issue our focus is on the Caribbean islands, hence the use of the concept “insular Caribbean.”
2. Although Spanish is the official language of only Cuba, Dominican Republic, and Puerto Rico, it is also spoken in many other islands, including the Dutch-speaking islands of Aruba, Curaçao and Bonaire. French is spoken in Guadeloupe, Haiti (and Haitian Creole), Martinique, St. Barthelemy, and St. Martin. While Dutch is spoken in more islands than French is, it is spoken in the smaller islands of Aruba, Bonaire, Curaçao, Saba, St. Eustatius and St. Maarten; hence the total number of Dutch-speaking people within the region is less. Dutch is always spoken along with other languages in the Caribbean. In the case of Saba and St. Eustatius it is with English, while in Aruba, Curaçao and Bonaire it is along with Spanish/Papiamentu. In addition, there are various Creole and Patois uniquely associated to specific islands and related to either French (e.g. Creole from Haiti, Grenada, St. Lucia, Dominica) or English (e.g. Jamaican Creole). There are also indigenous languages, whose words permeate all official island languages, geographic place names, and some of which are still spoken by indigenous peoples in the region (e.g. Dominica).

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