

The View from an Island: Jamaica

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He discusses the chief concerns of island nations, with the focus on the Caribbean, where islands are threatened by increasingly severe storms, rising sea levels, and drought.



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Courtesy of A. Anthony Chen

Imagine yourself 10,000 years ago, when the earth started warming after the last ice age, on an island in higher tropical latitudes, such as Jamaica. Without the benefit of thermometers and tidal gauges, you would probably not have perceived the gradual rise in temperature or sea level. You would not have seen the need to take any adaptation measures. Compare that with yourself as a modern islander. Over a lifetime you will experience a generally warming climate. You will feel the need to install air-conditioning or cooling fans in your home. You will come to believe that periods of drought and flooding have become more frequent, storm surges more destructive. You probably will be forced to take temporary measures to react to some of these climate outcomes, such as storing water during droughts or securing your home during a hurricane, but nothing on a planned basis.

What is the difference between 10,000 years ago and now? The former warming took place over thousands of years and was due to natural variations, such as in solar radiation, volcanic eruptions, and vegetation. The present warming has taken place over only a century and a half, and it is due not only to natural variations but also to increased emission of greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, since the time of the Industrial Revolution (IPCC, 2007). Both proxy data measurements and actual measurements have shown an exponential increase in these gases over the period (IPCC, 2007). With the benefit of measuring instruments, scientists have been able to detect a warming of the Caribbean region (Peterson and Taylor et al., 2002), drying conditions (Neelin et al., 2006), and rising sea level (Church et al., 2004).

Now, fast forward to 2100. While there are many scenarios that we can envisage, climate scientists are coming to a consensus that focuses on two: one in which temperature increases are kept below 2 degrees Celsius, and the other, above 2 degrees Celsius. Under these two scenarios, the effect of climate change will be of the same kind but more severe at higher temperatures, perhaps even



A flooded road in Kingston, Jamaica, the result of 2008 tropical storm Gustav, which claimed nearly 100 lives. Extreme storms and dry periods are becoming more common in the Caribbean.

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reaching a tipping point of no return. Two of the impacts of greatest concern, based on scientific studies, are in the water and health sectors.

Islanders in the high tropics can expect much drier conditions. This is because much of the moisture in high tropics will be transported to the equator, which will become wetter (IPCC, 2007). To see the consequences of this drying, we look at the results of a study done by ESL Management Solutions Limited (2008). Some watershed areas will become deficient. The watershed area serving the Kingston metropolitan area will be in surplus but will be severely strained. Communities supplied by a single spring or river will be increasingly vulnerable. Nonirrigated crops, which are important for the wider rural community in Jamaica and in the provision of locally grown crops and foodstuffs for the local Jamaican market, will be threatened. In contrast to drier conditions, rainfall associated with storms, even though less frequent, is expected to be more intense or heavier (Knutson and Tuleya, 2004; Knutson et al., 2008). Flooding, landslides, and soil erosion, especially in mountainous regions; sediment transport; and high turbidity in the water supply will produce devastating results. Given the coastal location of many of Jamaica's wells — for agriculture, public water

supply, and industrial use — increases in sea level will make these wells vulnerable to salt water intrusion and reduced water quality.

Many health issues will arise as documented in, for example, the Second National Communication of Jamaica to the United Nations Framework Convention on Climate Change, a report required from all parties in the UNFCCC. Dengue fever is a case in point. Temperature rises over 2 degrees Celsius can lead to a three-fold increase in the transmission of

dengue (Focks, 1995; Koopman et al., 1991). A direct link between temperature and dengue in the Caribbean has been reported (Chen et al., 2006; Chapter 2) in a study sponsored by the Assessments of Impacts and Adaptations to Climate Change (AIACC). Thus the transmission of dengue can be expected to increase in line with increased temperatures, along with increases in its more deadly form, dengue hemorrhagic fever.

Other effects include

- the probability of more intense hurricanes, the intensity of which is known to be naturally cyclical, but investigation shows that increased intensity can be caused by future rise in sea surface temperatures in the Atlantic;
- endangered human settlement due to sea level rise and storm surges;
- bleaching and possible death of coral reefs;
- depletion of coastal resources, including the death and migration of fishes to cooler waters;
- possible extinction of some plant species.

Compounded with concomitant conditions that could lead to a reduction in tourism, all the above, except the last, would lead to human suffering and pose serious challenges to social peace and economic progress.

Because of the severity of these challenges, reactive responses will no longer be possible. Planned adaptive strategies and actions must be put in place, either at the national or international level. On the national level, recommendations for the water sector, based on the 2008 ESL study, have been presented to the Ministry of Water for consideration. For adapting to increased dengue transmission, several strategies, including an early-warning system, have been suggested by the AIACC project (Chen et al., 2006) and presented to the Ministry of Health. A UNDP/GEF-sponsored Community Based Adaptation (CBA) program funds selected communities to adapt to climate change. A local funding agency, Environmental Foundation of Jamaica, also plays a significant role in funding nongovernmental organizations and other institutions for mitigation and adaptation projects.

Regionally, several initiatives are currently being undertaken to combat climate change. The Belize-based Caribbean Community Climate Change Centre (CCCCC) coordinates much of the Caribbean region's response to climate change. The center is a key node for information on climate change issues and on the region's response to managing and adapting to climate change in the Caribbean. The Caribbean Disaster Emergency Response Agency (CDERA), which is an interregional supportive network for countries within the Caribbean Community (CARICOM) based in Barbados, has made response to climate change part of its mandate. The respective national meteorological offices play important roles as well.

However, commitment of the region's policymakers in response to the threats posed by climate change has not been reflected generally at the national level. Guyana is the notable exception. Given the severity of the threats, it has been suggested (Hill, 2009) that the Jamaican government ensure that the global and all-encompassing nature of climate change is coordinated and integrated in all foreign

and domestic policies and programs, at all levels of the political system. The important roles played by national meteorological agencies will need to be strengthened and their expertise be tapped in policy making.

On the international level, the most pressing issue is mitigation of climate change. Developed and developing countries must make deep cuts in the emission of greenhouse gases to prevent the dangerous consequences that would arise from a climate change driven by a rise of more than 2 degrees Celsius in temperature. The case is being argued on behalf of small islands by the Alliance of Small Island States (AOSIS), an intergovernmental organization of low-lying coastal and small island countries that consolidates the voices of 43 small island developing states, 37 of which are members of the United Nations. The alliance represents 28 percent of the developing countries, 20 percent of the U.N.'s total membership, and 5 percent of the world population. Besides pressing for emission cuts, AOSIS is seeking a commitment from

developed countries to fund adaptation measures in small islands.

Our scenarios of past, present, and future islanders, have taken us from a scene in which little impact of climate was noted and little needed to be done about climate change to one in which the effects of climate change will

be severely felt. Small islanders have done the least to contribute to climate change but will be among those suffering the worst impacts. From the perspective of small islanders, it is imperative for all to act to mitigate and adapt to climate change. ■

References cited are listed in Additional Resources.

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