CLIMATE CHANGE AND EMIGRATION: COMPARING "SINKING ISLANDS" AND JAMAICA

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Abstract:

The image of "sinking islands" has become a popular way to initiate academic and policy discussions about the displacement of populations because of climate change. This unofficial grouping usually includes islands in the South Pacific and Indian Ocean such as Tuvalu, Kiribati and Maldives. While the images this grouping conjures are dramatic, islands which are not imminently sinking will face some of the same displacement scenarios. Sinking and non-sinking island will go through similar stages of degradation due to sea level rise, and coastal areas of high islands may also become uninhabitable. This paper considers broad sea-level rise susceptibilities for all island nations, comparing the "sinking islands" to Jamaica. Understanding the common factors for all islands is necessary in order to provide adequate strategies for migration or adaptation. Islands pose a unique geo-territorial challenge for climate change adaptation; however an island does not need to be "sinking" to necessitate out migration.

KEY WORDS: Jamaica, Island, Migration, Sea level rise, Sinking islands

Introduction

Island nations have a propensity for climate change displacement unlike many other places. With limited land area and natural resources, their fragile environments offer less in terms of adaptation than other larger landmasses. One aspect of adaptation is out migration which is seen as a necessity of those inhabiting some of the small low-lying islands also known as the "sinking islands". The islands most often described in this grouping are Tuvalu, Kiribati, and Maldives. Research on this group describes them in highly dramatic terms with a focus on literal submersion beneath the sea. While the idea of "sinking" is attention grabbing, there are many concerns to attend to well before anyone is ankle deep in water. The focus on "sinking" not only detracts from more immediate anxieties, but suggests that habitation is possible until this point. Because this is not the case, beginning to compare and contrast the plight of other islands can begin put a proper perspective onto the progression of sea level rise. "Sinking islands" will face the effects of sea level rise well before they are submerged, while others may have the propensity to exist and yet still become uninhabitable. This paper seeks to consider broader sea level rise susceptibilities for all island nations comparing the processes of the "sinking islands" to that of Jamaica.

Understanding the less generally discussed yet more widely problematic drivers of displacement is necessary to provide adequate strategies for migration, immigration or adaptation. While the imagery of islanders trying to conduct their everyday lives wading through water is concerning, it also implies that living a normal life is possible on these islands until then; that islanders will only need help if/when this happens. Unfortunately, this preoccupation prohibits adequate policy making for "sinking" and non-sinking islands alike. The world's oceans are filled with islands, thus it becomes imperative that adaptation based solutions are realistic.

While some of the strategies necessary for the "sinking islands" will be similar for non-sinking islands, the needs for external migration will vary. The example of Jamaica helps to establish these differences. Jamaica shares some of the sea based culture and economic characteristics of Tuvalu, Kiribati, and Maldives but its location and individual history establishes a different set of migration and adaptational needs. Just because Jamaica is not necessarily "sinking" in absolute terms does not mean that it will not be seriously affected by climate change. The paper will proceed as follows; I will

outline the concept of sinking islands and will disentangle its usage to put this issue in the proper perspective. Next, I will compare and contrast the displacement/migration strategies of the sinking islands with those necessary for Jamaica. This will include a broad understanding of the effects of sea level rise as well as other drivers of displacement. Finally, I will explain why it is essential to begin to understand future displacement scenarios of *all* islands.

Rising Waters

The "sinking island" is a concept that has become a well-known metaphor for the long term consequences of climate change. The term is often used to describe those places which will be most severely affected by climate change; the ones which will be completely lost to rising sea water. These are islands whose highest point is only a meter or so above sea level; this category usually includes the islands of Tuvalu, Kiribati, and the Maldives. These are tropical islands which conjure up images of idyllic palm trees, crystal waters and imminent doom. It is an image of tragedy in paradise. However, as a description, it can be damaging to substantive research. It detracts from serious issues that need to be addressed and focuses only on simple doomsday scenarios which are overtly sensational.

A common metaphor arises in the research of this topic; the canary in the coal mine. This poses serious difficulties for adequate research. Environmental groups have used the plight of the sinking islands, especially Tuvalu, as a rallying cry for environmental changes elsewhere in the world. Film media have also jumped on the bandwagon using Tuvalu as a representation of all threatened islands and green house disasters. Even the more cautious social scientists see Tuvalu as the 'canary in the coal mine': a true indicator of the seriousness of climate change (Connell, 2003). The usage of this metaphor can also be seen as a way for the developed world to construct their anxieties about climate change (Farbotko, 2010) and for newspapers to assign the people of Tuvalu a label of victimhood (Farbotko, 2005). Comparing Tuvalu and other "sinking islands" to the 'canary in the coal mine' suggests that they are expendable- as are their inhabitants. It also suggests that there is no hope to save them thus no need to discuss mitigation tactics- these islanders are simply doomed. Because scientific time frames

are mere generalities, not only are islanders doomed, but not knowing exactly when heightens the drama. Many news magazines and publications refer to this imagery as a dangerous paradise (Morris, 2009; Patel, 2006; Sheehan, 2002; Allen, 2004; Ede, 2002/2003; Warne, 2008; Lynas, 2004). This drives normative discussions about climate change and island nations into a place where the details on the ground do not matter; any island that is sinking can be integrated into this frame and delegitimized as an individual society.

Salinization of drinking water and agricultural land as well as more frequent and severe tropical storms has the potential to leave low lying island nations in an extremely vulnerable position- even without sinking. What is not fully understood is how damaging this label of "sinking islands" is to their actual plight. Not only does it suggest something that is inevitable, but it also implies a steady continuous process. Because scientific forecasts provide long term projections, we cannot know exactly when an island will sink. However, only focusing on the timeline for sinking ignores the fact that there are more problems associated with sea level rise other than the loss of land on which to stand. Long before islanders will be permanently ankle-deep in the ocean, they will suffer losses that will make is virtually impossible to stay that long.

Focusing on mitigation and adaptation strategies gives islanders back their agency and resourcefulness, argues Farbotko (2005). Identifying islanders as "tragic victims" marginalizes their adaptation strategies and silences any internal source of resilience. This author argues for a critical approach to representations of climate change in order to understand how images presented in the news media are problematic. Discussion of how labeling can be problematic is not uncommon in the refugee literature (Zetter, 1991; Zetter, 2007, Berringer, 2010). Outside representations of refugees and migrants often place them as victims, as welfare cases, and as helpless within their circumstance. In terms of labeling, those affected by climate change have yet to acquire a bureaucratic or universally recognized label. This is partially because it is difficult to untangle the environment from other drivers of migration. Environmental degradation comes in many forms and can spark a chain reaction that creates the impetus for migration; sometimes it is not simply that the climate is changing but that the loss of livelihoods that accompanies this that initiates the need to leave. Thus, one may appear to be an economic migrant, but is not pulled out by opportunity but pushed out by the

irreversible economic deterioration. Additionally, some are quick to use the terms 'environmental refugee" or "climate refugee" but these phrases are inaccurate as neither the environment or the climate persecutes; thus they cannot avail themselves of the protections of the protections of actual refugeehood.

For the remainder of this paper, I will refer to this set of countries which are most vulnerable to sea level rise as Eventually Uninhabitable Islands (EUIs). The purpose of which is to simplify the discussion and refer to a process as less than a doomsday scenario. It will be defined as those islands/islands chains that are geographically the closest to sea level, will lose their ability to support human habitation, and have already begun to deal with the consequences of rising sea water including frequent storm systems, larger storm surges, and tidal flooding. Maldives, Tuvalu and, Kiribati are not exhaustive of every island or country which can be considered an EUI, but those whose circumstances have started much of this initial debate and which will be referred to here.

As a group the EUI nations have much in common. All are low-lying geographically, have environmentally-based economies (either tourism, sea-faring, or agriculture) and have governments which are keenly aware of these issues and how it will affect their people. In this way, they are similarly situated to Jamaica; it is also highly dependent on tourism and agriculture. The simple geological similarity of being an island explains other parallels. Islands are, by nature, restrictive environments of limited sustainability. Any kind of economic base is structured within this limit. Island nations already understand the difficulties in sustaining a growing population or economy on scarce resources. They tend to be damaged more quickly than larger land areas if their ability to deal with this fact is less than adequate. For example, the development of industry, individualized products, and disposable packaging create mounds of garbage all over the globe. However, the small land area of an isolated island leaves less room for disposal. This is seen in the Maldives through the luxury their resort islands promise. Domroes (2001) describes this leisure lifestyle as harmful to the Maldives. Consumptive tourism creates garbage, sewage, and waste pollution as well as reef destruction. The considerable market returns of the Maldivian tourist industry have

come at a hefty price. Even though the government has enacted eco-friendly standards, adverse impacts have still been felt because of law violations, the over-exclusivity of facilities, and the consumptive lifestyle of foreign tourists who do not understand the fragility of Maldives' marine ecosystems.

For Kiribati and especially Tuvalu, their internal environmental issues has questioned if climate or pollution is really the impetus for their problems. Locke (2009) argues that the influx of population movements to urban central islands have changed the socioeconomic structure of small-island developing states. His work focuses on both Kiribati and Tuvalu and demonstrates how overpopulation strains resources and makes people less healthy. He observes that Kiribati imports more and more processed foods to make up for poor agricultural production. The population spike has also led to poor sanitation and inadequate sewage and garbage disposal. Similar circumstances prevail in the capital of Tuvalu where there is also overpopulation. Much of Funafuti is built over water and garbage-filled pits. They also import poor quality foodstuffs which has increased the Tuvaluan death rate. Allen (2004) describes these issues comparing Tuvalu to a small planet; its poor environmental stewardship is no more egregious that that of bigger nations, but because of its fragile, remote, and resource-poor landscape it has less room for error than other nations. However, these internal problems have become a barrier to outside help. Tuvalu and other islands have been implicitly and explicitly encouraged to resolve what is seen as their own development issues before neighboring nations will seriously consider additional migration schemes (Connell, 2003). Loughry (2009) explains that the populations of both Kiribati and Tuvalu deal with overcrowding, unemployment, poverty, pollution, and modernization. Climate change not only drives these issues but also multiplies their effects.

Internal ecological destruction, added to sea level rise, creates a process which erodes an islands' ability to continue to sustain human habitation. In the case of Tuvalu, climate change exacerbates its current issues of over-crowding. A move from one island to another only adds further stress on a strained ecosystem. Those displaced from their home island to Funafuti bring along the same impacts that forced them to leave. Ecological destruction leads to economic destruction because environmentally-based economies are very fragile. This is likely to be the process which makes EUIs what they are. Fishing grounds become depleted as increased temperatures change the pH balance

of coral reefs[1], agricultural land is salinized when sea level rise collides with high tide either spilling salt water over the land or bubbling it up through the soil. Additionally, wells contaminated in this way affects potable water supplies and cannot be used for agriculture or drinking. This makes basic subsistence difficult enough, let alone supporting a tourist industry. While foodstuffs can be imported, water is a different story. There are plenty of uninhabited islands around the globe: deserted islands are deserted for a reason. They cannot sustain even basic human life.

This highly destructive and irreversible process is what is fueling the need for migration out of Maldives, Tuvalu, and Kiribati. As of now, future migration options for the inhabitants of these islands are uncertain.

Jamaica: Similar Situation, Higher Elevation

Jamaica, unlike the "sinking islands", has not gotten nearly the same level of attention. No doomsday scenarios or paradise lost. While its situation has differences from that of the EUI nations, it shares with them many similarities and the likelihood of joining them, depending upon the eventual severity of climate change. The allure of the tropical islands, in any hemisphere, comes from their unique landscapes and geography. Sea level rise threatens this no matter where they lie, thus Jamaica and the Caribbean are just as susceptible to the effects of climate change as islands in the Pacific or Indian Ocean. Climate change will affect *all* island nations in similar ways, but this issue can be forgotten when the focus is only on sinking. These issues will be addressed below.

Jamaica is located in the Caribbean Sea just south of Cuba and southwest of Haiti and the Dominican Republic. It is one island with a coastline of 1,022km. Its highest point is 2,256m and is considered an island of mountainous terrain. However its population is much larger than the EUI nations combined. With an estimated 2,847,232 people as of July 2010, there are many more challenges to come. The tourist industry accounts for

[1] This description of ocean acidification is purposefully minimal as to not detract from the larger point. Acidification changes the ph balance of war coastal waters and kills coral reefs. This in turn breaks down the bottom the food chain and affects the availability of food at all levels, including human. It is a much more complicated chain reaction that is depicted here but can be further evaluated through the IPCC's Workshop on Impacts of Ocean Acidification on Marine Biology and Ecosystems (2011)at: http://www.ipcc-wg2.gov/meetings/workshops/OceanAcidification_WorkshopReport.pdf.

20% of the economy and it exports sugar, rum, coffee, yams, bauxite and other minerals. Like the EUI nations, it also imports much of its food and industrial and building supplies. Climate change has yet to become a component of everyday life, but its effects are beginning to be noticed. Concerns surround warmer temperatures, more natural disasters, change in rainfall patterns, and coastal erosion is emerging. Dr. Wendel Parham, the executive director of the Caribbean Agriculture and Research Development Institute (CARDI) has been vocal about these concerns especially that warmer temperatures will put more pressure on air conditioning and refrigeration, thus increasing energy needs in a nation that is already highly dependent on fossil fuels. The concerns of increased tropical storm intensity also include talks of a longer hurricane season which could suppress tourism; some may prefer to vacation somewhere safer or where an extended hurricane season does not interfere with their travel plans (Brown, 2005). The National Environmental and Planning Agency (NEPA) recently announced that the sea level rise will be a serious threat to Jamaica's coast, emphasizing that 95% of Jamaica's beaches are vulnerable to such a natural hazard. Hurricanes Ivan (2004), Wilma (2005) and Dean (2007) alone resulted in a 5 meter loss on Long Bay in Negril. This comes on top of a UNEP study stating that the beaches of Negril are already receding at a rate of between 0.5 and 1 meter per year. In addition, poor environmental and building practices including the dumping of illegal pollutants had contributed to the ineffectiveness of protectionary measures (Matthews, 2010).

Like the EUI nations, Jamaica also deals with increasingly overfilled landfills and its protectionary laws need better enforcement. Because it is also considered a developing nation, Jamaica receives a good deal of international aid to combat its high poverty and unemployment levels. It is a member of Alliance of Small Island States (AOSIS) and is working to be able to influence larger nations on this topic.

Additionally, Jamaica's situation is similar to the EUI nations in that beach erosion, coral bleaching, and intense tropical storms can significantly hurt tourism. In this way, it is comparable particularly to Maldives. The vulnerability of its coastal water supply to salinization associates it with Maldives, Tuvalu and Kiribati. A great risk to ground and surface water in Jamaica is the poor construction of sewage catchment and treatment systems. Many sewage systems are not properly constructed and, in some places, there is no system at all. Islanders dispose of their waste in "soak-away" pits that go directly

into the water table. Jamaica's water problems originate with unregulated drilling for water before 1961, when locals were allowed to drill. This led to the salinization of some areas due to excessive pumping. The process allowed sea water to seep into the island's aquifers. Contamination from bauxite mining caused by red mud waste and the by-products of rum production, have also adversely impacted the water quality (Hall, 2010). While these were not caused by climate change, they have contributed to a situation which already affects drinkable water even *before* climatic processes are added.

In many ways, Figure 1 outlines the major concerns of almost any country which is threatened by climate change. Though Tuvalu and Kiribati do not have the same concerns as Maldives and Jamaica in terms of tourism, clean and available water affects the lives of all islanders and small businesses.

Climate Change concerns for Maldives, Tuvalu, Kiribati and Jamaica			
	Food	Water	Infrastructure
Sea level Rise Issues	Salinization of Agriculture	Salinization of Potable water	Loss of Coastal homes, businesses and land
Extreme Climate Events	Unstable precipitation causing more frequent drought or deluge	Replenishment of drinking water or additional damage	Continuing threat from tropical cyclones and hurricanes

Figure 1. Long Term Concerns of Maldives, Tuvalu, Kiribati, and Jamaica

There are some important differences between these nations, however. Because of its mountainous terrain, Jamaica has less to worry about in the way of salinization of crops due to storm surge or tidal flooding. While this does not mean its crops will not face any danger, changes in precipitation, water collection, and potable supplies will eventually limit the quantities available for agriculture. The salinization of freshwater wells in coastal lowlands is a central concern because this water is also used for drinking. There is potential for conflict between those who need the water to produce food and those who simply drink it.

Jamaica's size also benefits it in terms of migration. There is more space for internal migration and resettlement than in places like Tuvalu and Kiribati. Because Jamaica is one island, not an island chain, the population is already located in one geographical area sharing its resources. However, more space does not necessarily equate to an easier facilitation of internal migration. Jamaicans and their government will have to contend with current property holders as well as considerable prices and building difficulties. One cannot assume that just because there are people that need to move inland, that there is unclaimed land open for them to inhabit. Those who own available land will most likely want to be compensated for its use. Because Jamaica is a highly touristed island, the price of land is at a premium. With continued beach deterioration and salinization of fresh water, it becomes a less friendly place to vacation. Almost fifteen percent (14.8%) of Jamaicans already live below the poverty line. A decline in the tourism industry will only add to this number. Even if lower tourism brings down property values, there are more people with even less money to buy a new place to live. In addition, building homes on a mountain side is no easy feat. There is a lack of suitable land to move people when simple topography is considered. Jamaica's Blue Mountains are a national treasure and park.

A final difference with the EUIs, Jamaica has strong ties with and large diaspora communities in the United States, Canada, and the United Kingdom. Little is written about diaspora communities stemming from Tuvalu, Maldives, or Kiribati on the other hand. Maldives was populated by diaspora communities from Sri Lanka and India. An economic pact between Tuvalu and New Zealand has created a growing community there; it is not nearly as large or as developed as any of Jamaica's. As colonial subjects, Jamaicans were eligible for unrestricted entry and permanent residence in Great Britain. However after independence, migrants had to apply under a skill-based system. The recession of the 1970's resulted in a decline of available jobs thus, migration shifted to the US and Canada (Horst, 2007). These communities offer an alternative to internal migration if host nations are willing to take them in. Familial relationships create a strong pull to migrate if one does not have to begin totally anew. These ties make a transition easier and bring the migrant into a new community that is culturally rebuilding what they have left. Many Caribbean islanders already visit family abroad; joining them if their current living conditions deteriorate would not necessarily be a

very difficult decision. Diaspora groups also have the ability to pressure their government to assist those back home. Many have become citizens of the countries in which they have migrated to, and if not, their work and commerce in these nations brings value to their population group.

While a collaborative effort toward changing its energy structure and increasing its capacity for adaptation are necessary, there is little Jamaica can do to protect itself from aquifer salinization. Sea level rise is beyond the control of any measure Jamaica or any other EUI can implement. It is making great strides toward adaptation, but migration has not yet been discussed as an option. One reason for this is that climate change is a slow process and there is no clear prediction which overlays timelines for environmental destruction with human activities. Islands which are not indefinitely sinking may not yet see the intricate ways in which sea level rise will still cause out migration. A focus on drinking water is imperative for Jamaica and any other island which uses underground water supplies. Human cannot live where there is no drinking water. While many places, such as Jamaica, import bottled water there is no realistic way to permanently and completely substitute bottles for natural sources of fresh water.

When water shortages are added to other effects of sea level rise such as the loss of coast lines, this provides a strong impetus for migration. These issues are part of the slow onset processes of climate change and most likely produce a small continuous stream of migrants as living conditions deteriorate. While any timeline associated with this movement cannot be predicted, there should be several signs which indicate that this process is underway. The loss of tourism is one indicator. The Jamaican government will be hard pressed to find new jobs for resort workers whose livelihoods slowly disappear when their job sites are taken by the sea. Beaches provide the basis for Jamaica's tourist economy, without sand there is not the same draw. This early migration will be due to livelihood loss from climate change. It may appear to be just economic migration until the ultimate driver is identified.

Economic migration has been the backbone of those who have created Jamaica's Diasporas. It is an embedded part of the history of the Caribbean. Diaspora

communities, in this case, can be seen as already laying the ground work for future out migration. However, popular host countries for Jamaicans have become less tolerant in their immigration policies due to terrorist concerns and constituency xenophobia. While the diaspora community may seem like the most obvious place to go, only time will tell if host countries will relax their policies to accept those whose livelihoods will not return due to climate concerns.

Conclusion

The slow deterioration of EUIs will be mirrored in all islands; many more will be added to this definition as time exposes their full vulnerability. Those which will still remain habitable may only be able to sustain lower population levels and will need livelihood strategies to make up for the losses of many traditional jobs. The difficulty for islands is that many of the losses sustained through climate change are from the specific geographic attributes which make them so unique. Additionally, the plight of islands and island nations can demonstrate the adaptational needs of larger landmasses. Ultimately all continents are islands and those which are becoming uninhabitable can provide lessons in strategy for the rest. Every landmass has a carrying capacity which is being stretched to the limit due to human population growth and resource exploitation. As was mentioned above, islands are most often judged in terms of their ability to be good stewards of their fragile ecosystems; larger nations have more room for error. However, a changing climate will reduce this space everywhere. Island adaptation and out migration patterns *will* be the precedent for all others- not just each other.

Island nations have a propensity for climate change displacement unlike many other places. Their limited land area and natural resources and fragile environments do not offer the same adaption options than other larger areas of land. One aspect of adaptation is out migration which is seen as a necessity of those inhabiting some of the small low lying islands. Called the “sinking islands”, this group has is at the forefront of talks on climate migration. However, the discourse surrounding them is not always helpful or welcome. The research on this group describes them in highly dramatic terms with a focus solely on literal submersion beneath the sea. While the idea of “sinking” is fascinating, there are many concerns to attend to well before anyone is ankle deep in water. This focus not only detracts from more immediate anxieties, but suggests that habitation is possible until this point. Because this is not the case, beginning to compare

and contrast the plight of other islands can begin put a proper perspective onto the progression of sea level rise.

By injecting the island nation of Jamaica into this dialogue, I have attempted to refocus the debate over climate change migration to consider sea level rise as a driver of migration in many places besides those which are sinking. Understanding the less generally discussed yet more widely problematic drivers of displacement is necessary to provide adequate strategies for migration, immigration or adaptation to all those who will be in need of them. A preoccupation with sinking prohibits adequate policy making for "sinking" and non-sinking islands alike. Geo territorial factors condition climate change response. The world's oceans are filled with islands, so it becomes imperative that adaptation based solutions are realistic. Thus far, only the most distant and exotic islands are being discussed as candidates for displacement due to sea level rise. The addition of Jamaica and its implications for the rest of the Caribbean can broaden the scope of this issue as well as relate it more directly to those who will bear the greatest monetary costs of the adaptation funds. Large emitters such as the United States, Canada, and Great Britain may seek to do more to curb their contributions to climate change and increase their aid to adaptation if they know that this problem will be washing up on their shores- so to speak.

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