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RESEARCH PAPER

Haiti and the politics of governance and community responses to Hurricane Matthew

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ABSTRACT

This article examines disaster preparedness and community responses to Hurricane Matthew in semi-urban and rural towns and villages in Grande-Anse, Haiti. Based on an ethnographic study conducted in the department of Grande-Anse one week after the hurricane made landfall in Haiti, the article focuses on the perspectives of citizens, community-based associations and local authorities in the affected areas. Sixty-three (63) interviews and 8 community meetings (focus groups) were conducted in 11 impacted sites in 8 communes. Results suggest that preexisting conditions in impacted communities, rather than deliberate and coordinated disaster management strategies, shaped levels of preparedness for and response to the disaster. Affected populations relied primarily on family networks and local forms of solidarity to attend to basic needs such as shelter, health and food. The main argument presented is that Haiti, by virtue of its geographic location, lack of resources, institutional fragility and vulnerability, must systematically integrate community-based assets and capacities in its responses to and management of disasters. Further, it is critical for the government, Haitian institutions, and society to apply integrated risk reduction and management and disaster preparedness measures in all aspects of life, if the country is to survive the many disasters to come in a time of climate change. These measures should be embedded in recovery and reconstruction efforts after Hurricane Matthew.

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Introduction

On October 4, 2016, Haiti suffered the effects of its most destructive natural disaster since the 2010 earthquake.¹ Hurricane Matthew, a category 4 storm, hit the southern peninsula of Haiti producing winds at 145 miles per hour.² The most severely affected regions were Grande-Anse, Sud, and Nippes, 3 of the country's 10 administrative departments. In Jérémie, 80% of homes were severely damaged.³ Approximately, 20% of the nation's population (2.1 million) were affected by Matthew, of which 175,509 have been displaced from their homes.⁴ The Government of Haiti (GoH) and the United Nations' Office for the Coordination of Humanitarian Affairs' most recent situation report estimates that Matthew claimed at least 546 lives and injured 438 people in Haiti.⁵

The study was conducted in the most affected areas in the departments of Sud and Grande-Anse. Together with the departments of Nippes and Sud-Est, they

constitute the southern region of Haiti, with numerous coastal towns bordered inland by rural, mountainous villages. With approximately 9 million Haitians living in poverty across the nation, and largely over-represented in rural areas, the Sud and Grande-Anse are characterized by disproportionate levels of extreme poverty and widening inequality.⁶ According to the Ministry of Public Health, the majority (77%) of poor households throughout rural Haiti depend on subsistence farming for their survival and are headed by men (62%) with just under 2 years of formal schooling.⁷ Consistent with other departments with large rural populations, access to public and social services in the Sud and Grande-Anse are extremely limited.^{6,7} Inadequate infrastructure, such as few and poor quality primary roadways, render travel to cities for services long and arduous and travel within and between the 2 regions even more challenging. According to the Inter-American Development Bank, by

2004 “only 5 percent of the country’s roads were in good condition. In fact, since 1991 Haiti had actually lost more than 1,000 km of rural roads.”⁸ It is important to note that prior to the disaster comparison data available for these departments reveal that the Sud had fared better, in terms of levels of poverty and access to services, than Grande-Anse which has the least access to potable water and sanitation services³ while, ironically, serving as the breadbasket of Haiti due to its “rich forests and vegetation.”³ Yet, over the past several decades Haiti’s vulnerability to disasters has substantially increased with the recurrence of flooding and droughts resulting in lost crops and hikes in food prices adversely affecting the rural poor.⁶ While the impact of Hurricane Matthew on the natural and built environments and the destruction of material and immaterial patrimonies are still to be fully assessed, we know that, in the aftermath of the disaster, from a health and human security perspective, an estimated 1.4 million (66.7%) of those affected were identified as needing assistance.⁹ According to the Government of Haiti, total damages attributed to Hurricane Matthew are estimated at 20% of Haiti’s gross domestic product,¹⁰ while other affected countries in the Caribbean, with similar exposure to Hurricane Matthew, were less impacted than Haiti (see discussion below). This level of vulnerability suggests that by virtue of Haiti’s geographic location, lack of resources, and institutional and social fragilities, coping with natural disasters is constitutive of the country’s existence. This fact of life, compounded by climate change, requires a closer examination of the extent to which the politics of disaster governance and response in Haiti helps mitigate risks and foster disaster preparedness.

For the past 2 decades, literature on disasters has insisted on exploring the ways in which human interactions with the natural environment can mitigate or exacerbate our exposure to risks and hazards.^{11,12,13,14} Further, human practices “unevenly distribute the impacts of catastrophes along lines of socially produced gender, race, class, and ethnic distinctions,” suggesting that the vulnerable are more susceptible to the long-term, if not fatal, effects of disasters.¹¹ The need for decentralized and integrated risk reduction and disaster preparedness management systems that include participatory governance and harnesses local/community capacities is critical for Haiti.^{15,16,17}

This article examines the effectiveness of disaster preparedness and response mechanisms in mitigating

risks and reducing the calamities of Hurricane Matthew from the perspective of local leaders and community members in rural and semi-rural Grande-Anse. The analysis is based on a weeklong ethnographic study, seeking to understand the immediate responses of community members, leaders and local officials as well as perceptions they held of responses from the national government, international donor institutions, and national and international non-governmental organizations (NGOs). This article reports only on preparedness and local responses in the aftermath of Matthew in rural communities and the coastal towns and villages. It does not seek to evaluate institutional or state responses to the disaster; instead it examines community perceptions of the timeliness and effectiveness of government orientation on preparedness and responses to Hurricane Matthew. This ethnographic exploration offers a preliminary understanding of how external sectors, defined as “governmental, private and donor institutions” providing resources or recovery assistance, engaged disaster-affected communities.¹⁷

Methods

The ethnographic study was conducted one week after the passage of Hurricane Matthew. Given the path of the hurricane (see “The Trauma Signature of 2016 Hurricane Matthew and the Psychosocial Impact on Haiti,” this volume), 11 sites from 8 communes in the Grande-Anse area were selected for implementation of this study. Sixty-three (63) interviews and 8 community meetings (focus groups) were conducted. Participants included local farmers, community leaders, and local officials (Mayors, representatives of the Office of Civil Protection (OCP), and representatives of the Administration of Communal Sections (CASEC)). Interviews were also conducted with 26 local officials, neighborhood leaders, religious leaders and citizens in Jérémie as well as 4 focus groups (community meetings) with local associations. This article focuses solely on the selected communal sections, towns and villages; therefore, data from Jérémie are not included in the analysis.

Three approaches characterize this study: a) one-on-one interviews with key individuals from affected households in urban, semi-urban and rural areas (Communal Sections); with local authorities and local leaders; b) site observations of damages and loss, recorded through field notes and c) focus-groups with

local community members – which consisted mainly of informal community meetings. The themes that guided the questions across the approaches above include: living conditions prior to the hurricane; sources of information on the hurricane; means through which information about the hurricane was obtained; comprehension of information circulated about the hurricane; protective measures to prepare for the hurricane; disaster experience and post-hurricane responses.

Narratives were annotated and coded for thematic analysis. Treatment of narratives was done using grounded theory for anthropological analysis. The Interuniversity Institute for Research and Development's Institutional Review Board has approved the research protocol and verbal authorization was obtained prior to any interviews or focus groups with participants.

Findings

Brief summary of key challenges common to rural sites

Preparedness

Across all rural sites, most of the information about Hurricane Matthew circulated via word of mouth only one day prior to the disaster. Farmers reported that they had heard some warnings on radio broadcasts either 2-days prior to the hurricane making landfall or the day of the disaster. According to the interviewees, the content of the warnings included the following: “to seek shelter,” “to put livestock in a safe place,” “avoid staying too close to river beds,” “if away from home return home,” “stockpile food before the cyclone hits.” There were also messages disseminated the day before the event (October 3rd) regarding health concerns but these messages were not widely diffused as inclement weather had already prevailed. The following composite answer came from a community meeting with 10 people (focus group) in Danglise, 3rd communal section of Abricots:

- The hurricane took us by surprise. Yes, they announced the cyclone (*yo anonse siklòn*) but we did not know what to expect.
- They said on the radio to seek shelter. Our houses are no better than our neighbors'; our houses could not resist what we saw.
- We were asked to seek shelter in schools and churches. We only have 4 schools here. Three [of

them] in the houses of 3 [different] teachers. Fortunately, we had not taken refuge in the chapel because we would have been dead today.

- There were rumors and no one knew who was saying what!
- The information came by word of mouth. But we did not know what was true!

Similar findings emerge from community meetings and interviews with farmers in rural communities in Guitonnière and Lafitte (1st communal section of Chambellan), Montagnac (5th communal section of Dame-Marie), and Barriadèle in Dame-Marie. Observational data collected suggest that these rural communities were among the most vulnerable to Hurricane Matthew (or any sustained tropical storms). Hurricane preparedness would imply the pre-existence of channels and venues of communication as well as standardization of its content. The Haitian peasantry is scattered throughout mountains and valleys with no road access and limited means of communication. The summary above provides a glimpse of the challenges associated with real time communication for preparedness for major hazard events in the areas studied.

Although interviews with individuals from mayoral offices, local representatives of the CASEC and the Office of Civil Protection (OCP) suggest that they had deployed all resources available to them for sending official warnings to their constituencies in rural areas, only those communal sections that were closest to towns were reached. Messages from local authorities and radio broadcasts were also relayed by churches and *humforts*.ⁱ The content of these messages were as vague as those received through word of mouth from non-officials. The most effective channel of communication was through the local “*notab*” (notable person or local leader) of the most accessible areas as they were best positioned to reach the greatest number of people. While these messages came from reliable sources, namely, the government and local authorities, their dissemination through word of mouth distorted information, creating doubt and, in some cases, suspicion as people were being asked to abandon their homes and meager possessions.

ⁱ Vodoun temples.

Impact and responses at the community level

Farmers in the areas studied experienced the impact of Hurricane Matthew at different speeds. Different narratives of the ways the disaster hit converge with the idea of the “suddenness” of the threat that the event brought with it; within hours winds increased unexpectedly from a moderate, but familiar, speed to a higher, more violent, speed announcing – what for many interviewees was – “the end of the world.” Interviewees reported that the speed and “suddenness” of Hurricane Matthew’s advance was beyond anything they had ever experienced in their lifetimes. During a focus group, when probed about what they meant by “suddenness,” participants reaffirmed that the hurricane was unpredictable as one of them explained:

Although some of us knew the cyclone was coming, it wasn’t until we saw it begin that we understood that the world was going to end. There was no time to move (*chanje plas*) the cattle, secure the goats, some of us had to use this time that was disappearing to run inside the house and secure our property. Everything was in the hands of God! There was no time.

Indeed, observational data collected in the field suggest that the time farmers would need to go to the place where they secure their livestock would, in many cases, be at least 1 day. Most farmers keep their livestock on land that they rent several kilometers away from where they live. Field notes were taken on differences and variations in patterns of animal husbandry in Grande-Anse, where the majority of land is owned by few families who rent, and sometimes sub-rent, parcels of land to poor peasants who cultivate them. A day of preparation for the majority of peasants in the Grande-Anse – at least in the communal sections studied – would not offer a practical window for them to sufficiently prepare for a hurricane of such magnitude. Unfortunately, we found at least 2 interviewees who mentioned that they knew individuals who lost their lives during last minute efforts to secure their cattle.

Conversely, landowners (*grands paysans*) who live in rural areas lost very few cattle, because they had the time, space and good fortune to secure their livestock in areas that were spared from severe devastation. However, observational data suggest that *grands paysans* suffered significant losses and damages as well. Nonetheless, the experience of time in preparedness was noticeably different between landowners and *petits paysans* (subsistence farmers).

Paradoxically, peasants interviewed expressed how mobile they were during the event. They recounted moments of intense winds that led to their houses collapsing or being uprooted by windsⁱⁱ. Most of the homes in rural areas are small, approximately 4 by 4 meters, with 2 rooms – some with a front porch. The roof is usually covered with metal sheets – a sign of relative modernization while more modest homes are covered with straw. These houses cannot resist a category one hurricane, let alone Matthew, which was a category 4. Scattered around hills and mountains, once their house was damaged or destroyed, some families waited for an intermittent period (*akalmi*) to move to the next house in the area, if they had good relations with their neighbors. Several participants in community meetings said that they moved from one house to the next only to see the next house destroyed, forcing them to move on to another, if there was one available. The experience of Hurricane Matthew was very threatening for residents given that some families remained exposed to rain, cold and strong winds for hours.

Most of the participants in this study were not waiting for a response from outside institutions, particularly the Haitian state. For them, the idea of a state response after a calamity is an anathema, as we will see below. Some participants insisted mentioning that “*Leta pran li pa bay*” (The state takes [from you] but does not give [to you]). The state is seen as a foreign entity embodied at times through authorities or important people in power who exploit the vulnerable. This is rooted in the historical relationship between the state and Haiti’s peasantry, a history that has been studied by scholars.^{18,19,20,21,22,23} Instead, they rely on family networks and neighbors, a reality that mirrored their responses to the disaster during the first four days following the hurricane which consisted of exchanges, solidarity, and support from family and community members.

Some members of rural communities were further marginalized by their fellow farmers. Old wounds and divisions persisted and were exacerbated, during this time of tragedy and severe adversity. In the 3rd

ⁱⁱ On a particularly sad note, one family witnessed their son “sucked out” by the winds along with the entire metal sheet roof that covered their home. This ethnographic assessment of local preparedness and response did not explore the mental health implications of Hurricane Matthew. The human costs of Matthew have been diluted in public emergency and humanitarian discourses as “needs.” This will be discussed in a different article.

communal section of Danglise (commune of Abricots), a field team member came upon an old lady accused of sorcery. For some community members, the entire family line had engaged in sorcery to the point that, according to one interviewee, “God got tired and let that calamity fall upon us.” Unfortunately, accusations of being a “*lougawou*”ⁱⁱⁱ and engaging in sorcery in the aftermath of Hurricane Matthew has since become a common currency in post-disaster Grande-Anse. During the course of fieldwork, team members met some evangelical missionaries who steadily believe that Haiti has signed a pact with the Devil and that these sorcerer families “must be turned to God.” Otherwise, they will face His “punishment.” When probed, one missionary responded with a Biblical passage, “*Le salaire du péché c’est la mort*” (The wages of sin is death).

Other forms of in-network solidarity in response to the impact of the hurricane that were very present throughout the sites were remittances and family visits from the towns and villages that themselves were affected by the hurricane. Despite difficulty of access (collapsed bridges; severe road damage; active flooding), some family members from Abricots, Jérémie, Moron, Chambellan, Dame-Marie and even from Port-au-Prince were able to reach a relative in a city, town or village, who, in turn, was able to reach another relative, in a rural area, less than 3 days after the passage of Hurricane Matthew, a feat that the national government and international organizations were unable to accomplish.

Perceived responses from the state and other agencies

In all rural sites and selected towns, the absence of the national and regional governments did not go unnoticed. We interviewed members of the Mayor’s office as well as one CASEC in Balisiers, 2nd communal section in Abricots, the CASEC for the 8th communal section of Fond Rouge Dayè (commune of Jérémie), the Mayor and his assistant in Anse-d’Hainault, the local police, and the Mayor of Les Irois. Up to 8 days after the hurricane they had not seen any representatives of the government in their communes or communal sections. In fact, until the end of fieldwork, no presence of the state or element of response to the disaster could be reported by CASEC representatives in the communal sections studied.

International responses from non-governmental organizations (NGOs) were reported on the 4th and 5th day after the event, mostly in the towns and in more accessible villages. Study participants reported walking several kilometers into town to seek care for their loved ones and/or wait on long distribution lines for food and relief supplies, if they were informed of such relief efforts. As we shall see, local authorities in cities and towns managed to effectuate the distribution of humanitarian aid to political affiliates and patrons, networks of *notabs*, and members of the populace in the town who were not as severely affected by the disaster as those from rural areas in the mountains of the communal sections.

Key challenges common to semi-urban areas

Preparedness

Challenges in preparedness varied depending on whether the participants were from coastal or inland towns or villages. Participants in Abricots, Bonbon, Dame-Marie, and Les Irois were informed of the progression and trajectory of the hurricane via radio broadcasts or from representatives of the regional branch of the Office of Civil Protection. Participants reported that those who lived practically on the edge of the seashore were required to evacuate. One community epitomizes this situation: Barriadèle, a fishing village in the 1st communal section of Dame-Marie, was almost wiped out by tidal waves. Prior to the hurricane, the 800 families inhabiting this community lived below sea level in one of the most volatile coastal areas of southern Grande-Anse. The area is spread across approximately 2 miles of pristine, white sand beach that attracts urbanites, the Haitian diaspora, and others to build private beach homes. Despite its location on the Caribbean Sea, observational data indicates that Barriadèle is an extremely poor fishing community with no access to potable water or sanitation. These factors, according to Cuban medical volunteers in the health clinic in neighboring Anse-d’Hainault, render residents vulnerable to numerous health risks including; malnutrition, dysentery, and other infectious diseases. Our interviews with community members and the local CASEC, reveal what can be interpreted as a pattern in preparedness and response in all affected coastal areas and their poor agglomerations. Below is a composite of the common narratives of preparedness among the residents of Barriadèle:

ⁱⁱⁱ *Lougawou* can be literally translated as “werewolf” but in this context means sorcerer.

- I did not go anywhere (at landfall) because I did not have anywhere to go.
- We did not go anywhere because we wanted to stick together. We sheltered each other and if we were to die we would die together.
- The CASEC representative told us that we should move but the CASEC representative himself had nowhere to go.
- God would protect us.

At the time of landfall, many were traumatized by the force of winds as they watched the sea advance into the village, merging with the land. By their own accounts, in less than 3 hours all their houses were buried in sand. The representative of the CASEC explained: “We moved together to higher ground, away from the trees. That was our shelter.” These statements reveal the high level of vulnerability of this coastal population, including the local official charged with guiding the disaster response—whose only asset was community solidarity.

Though radio broadcasts were used to inform communities of the impending hurricane, there were reports of poor reception and limited transmission by many participants. Still information was available before the hurricane as reported by the interviewees. To the question: “Why didn’t you look for shelter if your area was so vulnerable?” Participants were adamant about not trusting the Haitian state. As one participant in coastal Barriadèle explained: “People from the government will come to take our land to sell it for thousands and build beach homes. We don’t trust them.” Similarly, mistrust in the inland communes of Marfranc, Chambellan, Moro, and Beaumont were linked to the association of the state and its powerful tenants as “*lougawou* (see iii),” in the sense of a predator. Participants in these rural towns are reluctant to espouse strategies proposed by state institutions as, according to one participant, “They have direct experience of being fooled by agents of the government who have seized every opportunity to prey on the weak, particularly by stealing their land.” As mentioned above, in rural areas, the state has a strong history of predatory practices against the nation and its peasantry.^{20,21,22}

Across all towns and villages, although government warnings and instructions were issued, participants interviewed highlighted the impracticability of some of the preparedness measures, presented below in composite terms:

- They ask you to go to a shelter but there are no shelters available even within a day’s walk from here.

- They asked us to stockpile food and we have no food.
- They asked us to stockpile water and we don’t have water.

Impact and community responses

The impact of Hurricane Matthew on the coastal towns and villages studied, particularly Dame-Marie, Anse-d’Hainault, and Les Irois, is indescribable. Native trees more than one hundred years old were uprooted and post-colonial trees, such as the *hevea*, planted for rubber plantations during the United States Occupation of Haiti, were cut down by winds. Data from observations, combined with interviews with local officials, such as the Mayors of Dame-Marie and Les Irois and CASEC representatives, suggest that neighborhoods, communities, villages, and towns in the aftermath of the disaster relied primarily on themselves, their family networks, the patronage system, and neighborhood solidarity. Les Irois, for example, received its first outside intervention from the Red Cross 5 days after the disaster. Anse d’Hainault, relied on the Cuban post-disaster medical team that arrived in town 4 days after Hurricane Matthew struck. Interviews with the Mayor of the town revealed that, because of the presence of Cuban physicians, a post-disaster cholera outbreak of 157 cases dropped significantly to less than 20 within a week.

One trend that emerged was solidarity between the Mayors’ Offices of Anse-d’Hainault and Les Irois, which shared resources, mostly medical supplies brought by Cuban physicians to Anse d’Hainault, in a time of scarcity - an important model for best practices in disaster response in Haiti.

Perceived responses from the Haitian state and other agencies

As mentioned in the above cases, state presence remained largely unseen, according to study participants including local elected officials. Raising concerns regarding the limitations of decentralized disaster governance, as has been explored by Rumbach²⁴, local officials reflected on the need for capacity building in disaster management as they were ill-prepared and ill-equipped to confront a disaster of such magnitude. The response from most international organizations began in earnest 4 days after the disaster. However, these responses, as was observed in the field, were filtered through the measures of local power.

Powerbrokers in cities (Jérémie, in the Grande-Anse, and Cayes, in the Sud) mediated the distribution of emergency goods, including food, health (e.g., water, Aquatabs, etc.) and relief supplies (e.g., tarps, etc.). City representatives and the networks of power that structure them have served as mediators that at times concentrate the flow of distribution among those who are well-connected and those who have a slight advantage in the hierarchy of power. This model described at the level of cities was also replicated in towns, where the resources brought by humanitarian organizations largely benefitted those connected with local politicians and networks of “*notabs*.” This was observed in the city of Abricots when a humanitarian boat from the Netherlands brought food and other vital goods to those who had been impacted by the hurricane. Most of the aid was distributed in the town of Abricots while those who lived in the communal sections – the areas hardest hit by Hurricane Matthew – had no idea that there was assistance of any sort available to them.

Discussion

Hurricane Matthew: Regional responses and comparative impacts

Residents of several Caribbean countries including Cuba, Haiti, Jamaica, the Dominican Republic, among others, were forewarned of the potential destruction of Hurricane Matthew, which was projected to be one of the most powerful hurricanes to hit the Caribbean since 2007. In preparation for the hurricane each island activated their emergency and disaster management response mechanisms through their respective government agencies: The Volunteer Civil Defense members (Cuba); the Jamaica Defence Force (JDF), the Center for Emergency Operations (the Dominican Republic), and the Office of Civil Protection (Haiti). The primary objectives of these efforts were to: warn residents to take measures to mitigate risks and minimize losses and damages, encourage the evacuation of people living in high risk areas, and provide accommodations to those with no alternative housing options. In Cuba, volunteer Civil Defense members went door-to-door while government officials issued warnings.²⁵ More than 900,000 people were evacuated and over 50,000 livestock relocated as a result of this effort.²⁶ In Jamaica, 150 emergency shelters with a capacity to accommodate up to 3,500 people were

made available throughout the country.²⁷ The JDF, working with parish disaster relief coordinators, was charged with collecting and distributing relief supplies and positioned to launch search and rescue missions as well as support local police in maintaining law and order, where necessary.²⁸ In the Dominican Republic, over 35,000 people were evacuated from 22 provinces, 3,700 people were provided with emergency shelter and 28 were rescued.^{29,30}

In Haiti, official reports suggest that the Office of Civil Protection (OCP) was mobilized going door-to-door warning residents in high risk areas of the impending hurricane, encouraging preparedness and evacuation.^{31,32} While local representatives of the OCP in the towns did what they could to inform their fellow citizens, most villages and localities in the communal sections did not receive such warnings or information on preparedness. Haiti’s interim President, Jocelerme Privert, hosted a radio broadcast where he warned residents in the southern region to evacuate announcing school closings and the availability of 1300 emergency shelters across the nation with the capacity to accommodate 340,000 people for those living in high risk areas.³¹ The OCP was also responsible for the distribution of hurricane and relief supplies, much of which were international aid donations; however, there were concerns as fewer supplies had been received than in previous years.³¹ Based on the accounts of study participants humanitarian responses in the aftermath of the hurricane were, at best, limited to the cities and towns.

Haiti and its vulnerability to disasters

For several decades, Haitians have lived in a constant state of political, economic and social instability.^{18,19,20,21,22,23} Persistent instability and weak governance has resulted in poor urban planning, over-centralization of public services, massive deforestation, and disproportionate migration from rural areas to urban centers thereby exacerbating the threat of climate change urban centers, making the Haitian population “one of the most exposed in the world to natural disasters.”²⁶ More importantly, contextual factors have made complex emergencies an existential threat for Haitian society and its core institutions. This is evident when one examines the impact of the following natural disasters on Haiti as seen below in [Table 1](#).

When considering Hurricane Matthew with respect to the above-referenced disasters, with total damages

Table 1. Summary of Disasters in Haiti 2004–2010.

Summary of the last 4 disasters in Haiti			
Event	Effect on GDP	Individuals affected	Dead
2004 Hurricane Jeanne	7% of GDP	300,000	5,000
2007 Hurricanes Dean and Noel	2% of GDP	194,000	330
2008 Hurricanes Fay, Gustav, Hanna and Ike	15% of GDP	1,000,000	800
2010 Earthquake	100% of GDP	2,000,000	222,500
TOTAL		3,494,000	228,600 ^{iv}

Notes. Taken from Government of Haiti, Haiti Earthquake PDNA (2010).³³

^{iv} Note that this is the total reflected in the original 2010 Post-Disaster Needs Assessment, however the total should be 228,630 based on the figures provided in the table.

estimated at 20% of gross domestic product, approximately USD \$1.89 billion, Matthew is one of the costliest natural disasters Haiti has experienced this century, second only to the 2010 earthquake.¹⁰ Of note is that following the 2010 earthquake, the Government of Haiti (GoH) developed a series of reports documenting damages and losses as well as a plan for Haiti's recovery. The Action Plan for National Recovery and Development included a section on risk management and disaster preparedness with particular focus on earthquakes and hurricanes. The recommendations included three principal areas of focus: disaster governance, to be led by the Ministry of Interior and Territorial Communities which would also recruit and train personnel in local municipalities; protecting the built environment, through the establishment of building codes and maintenance of infrastructure; and revision of the State of Emergency law.³⁷ While the scope of this community-based assessment limits our ability to determine whether all of these recommendations were carried out, the data collected provide some insights into the lessons learned from the earthquake, how they were applied and their efficacy in mitigating risks and responding to Hurricane Matthew.

Though each Caribbean country executed disaster response plans that shared many similarities, the devastation caused by the hurricane was significantly more tragic for Haiti than its neighbors for 2 principal reasons: 1) the category 4 storm made landfall directly over the Tiburon peninsula in southern Haiti and 2) incongruence between the disaster response and realities on the ground. While Jamaica was largely spared, as the hurricane was downgraded to a tropical storm, the impacts on Cuba and the Dominican Republic were seemingly comparable when considering casualties as the former reported none, a fact that can be attributed to their “internationally recognized

prevention and alert system,” and the latter suffered 4.^{25,34,35} In Haiti, on the other hand, approximately one-fifth of the nation's population were affected, more than 500 deaths were recorded and 128 people remain missing.^{4,9} In response, the United Nations issued a flash appeal for USD \$119.8 million to provide humanitarian assistance to 750,000 Haitians over the next 3 months.⁵ Yet, the destruction and damage caused to property, livestock, crops, infrastructure, and the natural environment were significant for both Cuba and Haiti.^{2,36} This is particularly significant for Haiti, where “agriculture, livestock, farming and fishing were identified as the primary forces of economic revival as well as regional and local economic recovery” in the aftermath of the 2010 disaster, a revival that has yet to come to pass.³⁷

Hurricane Matthew struck Haiti and Cuba with similar strength and in areas with similar demographics: regions with semi-urban, rural, and remote areas anchored by relatively small cities. And while each government's disaster preparation and response shared many similarities - a communications scheme to warn residents of the impending hurricane and a shelter system established to protect the most vulnerable - there were differences, both real and contextual, that belied realities on the ground which account for the disparity in number of casualties. There are some key distinctions between the 2 countries; contextual factors that would render Cuba's risk reduction and response plans ineffective in Haiti. Cuba's disaster management plan relies on very robust health and education sectors that serve the majority of its population, strengthening its ability to govern due to its capillary power.³⁸ Cuba has over 160 hospitals and 450 polyclinics whose quality are reflected in its low mortality rate of 4.6 and an average life expectancy of 78.8 years.³⁹ In terms of education, more than 98% and 86% of its children and youth are enrolled in primary and secondary school, respectively, where disaster preparedness and prevention have been incorporated into the curriculum.^{36,40} Haiti, on the other hand, relies heavily on NGOs for the provision of almost half of its primary healthcare services and faces a number of public health challenges due to poor sanitation and waste management and limited access to potable water.^{6,41} Primary and secondary school participation rates are at 77% and 25%, respectively.⁴⁰ It could be argued that the key component underscoring the effectiveness of Cuba's disaster management system over Haiti's is a strong governance system and the existence of political will. Whereas Cuba developed its

disaster management system after suffering 1,200 casualties in 1963 after Hurricane Flora, Haiti has yet to heed to the lessons learned over the past decade and a half during which time approximately 230,000 lives have been lost due to a combination of natural and manmade disasters.³⁹

Conclusion

The history of disasters in Haiti, the severity of their impact and the nation's vulnerability to future disasters, combined with resource constraints- both financial and human- suggest that risk reduction and disaster management models cannot be exported from abroad but must be tailored to the local reality. Best practices in disaster management suggest that community-based approaches firmly rooted in local contexts are more effective than top-down systems.²⁴ Integrated disaster governance should be a collective undertaking that includes the government (national and local), the private sector, and civil society organizations.^{24,42} This is particularly critical in a nation such as Haiti where the over-centralization of services and labor opportunities (both formal and informal) has led to mass urban migration, mostly concentrated in Port-au-Prince and to a lesser extent Cap-Haïtien, leaving the remaining, largely agrarian population in remote, and often inaccessible, rural areas that, for the most part, have been abandoned unto themselves. The nation's economy is dependent on agriculture with subsistence farming predominating in rural areas. Most families live in conditions of poverty, one-third of which is extreme, and have limited access to public services.^{6,37} Over-centralization in particular was cited as being partially responsible for the record number of casualties caused by the 2010 earthquake, generating an interest in regional development in order to facilitate decentralization. The earthquake unveiled the need for risk reduction and mitigation as well as disaster preparedness and management plans so that history would not repeat itself, at least on the same scale.

Hurricane Matthew now calls our attention to the need for a context-specific, locally developed integrated risk governance and disaster preparedness mechanism that incorporates community participation at all levels. The only viable option for Haiti to address this existential threat of hazard events is to systematically integrate community-based assets and capacities in its responses to and management of disasters. Further, it is critical for the government, Haitian institutions, and society to apply integrated risk reduction and management and disaster

preparedness measures in all aspects of life, if the country is to survive the many disasters to come in a time of climate change. These measures should be embedded in recovery and reconstruction efforts after Hurricane Matthew.

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