

Cultural heritage and local ecological knowledge under threat: Two Caribbean examples from Barbuda and Puerto Rico

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Abstract

While the impacts to the infrastructures in Barbuda and Puerto Rico by Hurricanes Irma and Maria have received attention in the news media, less has been reported about the impacts of these catastrophic events on the tangible and intangible cultural heritage of these Caribbean islands. This report provides an assessment of the impacts on the cultural heritage by these storms; tangible heritage includes historic buildings, museums, monuments, documents and other artifacts and intangible heritage includes traditional artistry, festivities, and more frequent activities such as religious services and laundering. While the physical destruction was massive, the social contexts in which these islands existed lessened the resiliency of the people to respond and rebuild after the storms. While change may be inevitable for Barbuda and Puerto Rico, disaster capitalism is threatening the cultures of the people, and may result in the loss of local knowledge and practices.

Key words: Barbuda, Puerto Rico, culture, heritage, disaster, Hurricane Irma, Hurricane Maria

1 Introduction

Cultural heritage and local knowledge codify local responses to climate change, identify people with the locality where they live, and help identify change and risk. Cultural heritage in particular, can open the door to conversations about climate change and help transform the abstract numbers provided by scientists into tangible, real life impacts to local identities (Adger, Barnett, Brown, Marshall, & O'Brien, 2013; Adger, Quinn, Lorenzoni, Murphy, & Sweeney, 2013; Funari & Garraffoni, 2016; Schaepe, Angelbeck, Snook, & Welch, 2017; Zabala, Fabra, Aichino, & De Carli, 2015). However, cultural heritage is also being impacted and damaged by the effects of climate change. Archaeological sites, historic buildings, museums, archives and cultural landscapes are being affected, eroded and destroyed by sea level rise, wild fires, floods, displacement of people, and many other impacts at local and regional scales (Fitzpatrick, 2012; Rockman, 2015; Hambrecht & Rockman, 2017).

Category 5 Hurricanes Irma and Maria hit the islands of Barbuda and Puerto Rico in September 2017 and did extensive damage to the landscapes and infrastructures of these islands (Hu & Smith, 2018; "Before & after satellite photos, 2017"). The physical damage has been greatly publicized in the news media, and efforts to varying extent are being made to recover the infrastructures of the communities that were damaged. However, and perhaps less covered in the media, are the impacts that Hurricanes Irma and Maria had over the tangible and intangible cultural heritage of Barbuda and Puerto Rico (Boger & Perdikaris, 2019; Ezcurra & Rivera-Collazo, 2018; Gould & Lewis, 2018; Medina Triana, 2018). In this report we put forth our assessment of effects that these changes had, are having, and will continue to have over the vulnerabilities and resilience of Barbudans and Puerto Ricans in the future (Ezcurra & Rivera-Collazo, 2018; Perdikaris et al., 2018).

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We argue that the tangible and intangible cultural heritage are important components of recovery efforts and should not be neglected for building long-term resilience of people and places (Beagan & Dolan, 2015; Beel et al., 2017; Callaghan & Colton, 2008; Clarke & Mayer, 2017; Rivera-Collazo & Rodríguez-Franco, 2018; Skerratt, 2013).

2 Social context before the 2017 Hurricane Season

In spite of their different spatial areas, historical backgrounds and political contexts, both Barbuda and Puerto Rico – like other Caribbean islands – face many challenges including food insecurity, coastal erosion, storm surges, inadequate water quality and quantity, high poverty and unemployment levels, and limited economic opportunities that result in a ‘brain drain’ of young, educated people migrating off the islands (Colón, 2015; Council, P.R.R.C., 2013; Flecha, Ortiz, & Dones, 2017). Even though Puerto Rico has shown a growing number of young farmers in the last decade, farming on Barbuda is on a decline due to droughts, erosion and nutrient depleted soils, and to the loss of local traditional knowledge (Boger, Perdikaris, Potter, & Adams, 2016; Potter, Chenoweth, & Day, 2017; Gore-Francis, 2014). Soil depletion is particularly problematic in Barbuda which is less geologically diverse than Puerto Rico. Fishing, a particularly important subsistence practice for Barbuda, can no longer sustain the population, partly due to the bleaching and dying of reefs throughout the Caribbean that contributes to the depletion of nearshore fish stocks (Pratchett, Thompson, Hoey, Cowman, & Wilson, 2018). Puerto Rico’s subsistence is mostly dependent on imports, as less than 15% of foodstuffs are locally produced (Carro-Figueroa, 2002; Pérez Morales, 2017; Reverón Collazo, 2017). Puerto Rico is also battling with decades of poor governmental management, aging basic infrastructure (water, power, roads, health, social support), unsound built environment, and a highly burdening legal and political colonial relationship with the United States (Carro-Figueroa, 2002; Council, P.R.R.C., 2013).

These interconnected challenges intensify and become increasingly urgent as sea level rises and climatic changes cause fluctuations in temperature and precipitation patterns, including the intensity and frequency of storm events (Carabine & Dupar, 2014; Council, P.R.R.C., 2013). Coastal erosion, increased frequency and intensity of storms, and unsound land development are the major threats to the islands’ cultural heritage. Furthermore, the lack of strong legislation concerning heritage resources in Antigua and Barbuda (Murphy, 2011), and the political strangling of cultural institutions in Puerto Rico in spite of strong legislation, leave archaeological sites both unknown and unprotected. Unfortunately, other Caribbean nations face similar challenges (Fitzpatrick & Keegan, 2007; Hofman & Havisser, 2015; Siegel & Richter, 2011; Siegel, 2013).

Within this complex social context, Hurricanes Irma and Maria devastated Barbuda and Puerto Rico respectively. In Barbuda, while many of the concrete buildings only lost their roofs, unsecured shipping containers propelled by 155 mph sustained winds and 185 to over 200 mph gusts, became lethal to structures, property and animals, and the wind and water claimed the life of one child (“One dead after”, 2017). Barbudans were forcibly evacuated by the military (Chappell, 2017; Lyons, 2017) and kept off their island initially for 3 weeks, but was prolonged for six weeks because health officials did not give clearance (Boger & Perdikaris, 2019). Many displaced people were housed in the cricket stadium in Antigua. In September 2018, the last 40 people were kicked out of the stadium; half of these were children (“A year after Irma”, 2018). The absence of people triggered further destruction on Barbuda. Damaged properties were left to rot in the rain and sun, and were ramaged by pigs, dogs and rats all the while destroying memories and belongings. Dogs were shot and poisoned. Livestock was attacked by dogs while the majority of vegetation was completely stripped from its leaves, inundated by salt water, or completely broken and uprooted. In Puerto Rico, the impact of Irma followed by Maria, in the context of a society very vulnerable to crisis (Rivera-Collazo, Rodríguez-Franco and Garay-Vázquez, 2018) triggered a catastrophe of a magnitude that has no precedent in recent history. Thousands of people have died (Kishore et al., 2018; Rivera & Rolke, 2018), hundreds of thousands of houses were damaged or destroyed, the aging infrastructure collapsed, and health and relief services have not been able to cope with the situation. As a hurricane, Maria was a catastrophic event, but the crisis, the disaster, was not the hurricane itself but the lack of preparedness and the absence of effective response.

3 Hurricane Irma and the damage to tangible heritage sites in Barbuda

After the impact of Hurricane Irma to Barbuda, the authors conducted a preliminary impact assessment to tangible cultural heritage that included evaluation of built heritage, museums, archives, collections, the Barbuda Research Center, and archaeological sites.

4 Hurricane Maria and the damage to tangible heritage sites in Puerto Rico

Hurricane Maria destroyed communication with and within Puerto Rico. The mitigation of threats to human life took precedent before any assessment of impact to cultural heritage. However, several months and even years after the event, the devastation is still evident (Huber, Klinger, & O'Hara, 2018; Masters, 2017; "Puerto Rico a year after", 2018). Museums, archives and libraries were affected by flooding and lack of power. Absence of atmospheric control, flooding, and water filtration has caused damage to book stores and historical archives, including mold and water damage. The Archivo General de Puerto Rico, the Island's main and largest repository of historical documents, was not able to activate emergency power generation for months, which led to significant deterioration of historic documents due to uncontrolled heat and moisture. The historic and research facilities of the University of Puerto Rico were damaged and some were totally destroyed. The head office of the Built Heritage Program of the Institute of Puerto Rican Culture was nearly destroyed by the wind, and many documents for which there is no copy were damaged or destroyed by the rain and wind.

The direct assessment of sites and structures included in the National Register for Historic Places is currently underway by the State Historic Preservation Office with support from specialists from abroad, including National Parks Service and FEMA (Rivera-Collazo, 2019). An initial assessment of the impact to historic structures was conducted by Para la Naturaleza and the School of Architecture of the University of Puerto Rico in October-November 2017, visiting 34 municipalities, and surveying 4882 historic properties (Sanabria and Luna-Serbiá, 2017). Safety conditions impeded access to other locations. Additional survey and impact assessments on coastal archaeological sites will be developed in collaboration with University of California San Diego and local volunteers. Before Maria, fourteen historic districts were recognized in Puerto Rico with an estimated total of 8850 properties. There are 225 state-listed historic sites outside historic zones as well as over three thousand other buildings that exist in dense areas eligible for historic-zone designation and an indeterminate quantity (possibly over a thousand) within rural areas. It is estimated that about two-thirds of contributing structures in historic zones were damaged in some visible degree. Major damage or total collapse was observed in ca. 7% of surveyed structures. This number might be even higher as structural damage might not yet be evident.



Figure 2. Map illustrating a selection of threatened cultural heritage sites in Puerto Rico. The map marks only sites within 20m of elevation from sea level, and all the properties listed in the National Register of Historic Sites (data available in <https://www.nps.gov/nr/research/>). Note that this map does not show all known archaeological sites on the Island. A complete and systematic assessment of impact to cultural heritage is still lacking.

The most significant damage to historic structures was documented on the municipalities of the south-east, closer to the point of entry to of the eye of the hurricane (Pasch, Penny, & Berg, 2018). In general terms, damage has been more severe in structures with wood-frame roofs and corrugated iron roof cladding. In the town of Arroyo, over 80% of these structures were significantly damaged. Roof loss in these buildings also implied significant loss of integrity of walls, floors and foundation assemblies, as well as interior features such as the “*mediopunto*” or archway partitions which are classic markers of *criollo* architecture (Messina, 2005). Masonry and brick structures were also affected; ripped doors and windows, fallen walls and collapsed roofs have been observed.

Flooding was particularly damaging to the built heritage of sugarcane landscapes constructed on the coastal floodplains, although the damage was not even throughout. While 90% of Santa Elena sugarmill in Toa Baja was damaged, the historic structures of Hacienda Esperanza in Manati were basically unaffected. The anthropogenic Coffee Landscapes of the interior of the island have also been severely affected with a significant loss of coffee trees and traditional wooden coffee haciendas and mills.

Regarding the archaeological heritage, Puerto Rico has well over three thousand archaeological sites distributed throughout the island. Before the impact of Maria, twenty-seven (27) coastal archaeological sites had been identified as under threat by sea level rise in the present, and an additional one hundred and forty-eight sites (148) to be threatened by a sea level rise of 1.8 meters by the year 2100 (Ezcurra & Rivera-Collazo, 2018). Hurricane Maria brought a 9-foot (2.7 meters) storm surge (Pasch, Penny, & Berg, 2018); all sites in the threatened list of 2100 can be expected to have received some impact. Preliminary reports suggest that erosion has severely affected coastal sites, including Puerto las Vacas, Tierras Nuevas, Punta Boquilla, and many others. Additional sites have also been exposed, but more detailed examination is required. Exposure of sites has also reignited looting, but damage to regulating institutions, such as the Institute of Puerto Rican Culture, hampers the possibility of intervention and protection of this aspect of the tangible heritage. While no official reports have been received of damaged archaeological collections in official repositories, impacts to the preservation of perishable artifacts are expected due to lack of environmental controls caused by loss of power (Rivera-Collazo, 2019). Some very limited intervention is known to be happening, such as L. Antonio Curet’s work with the collections from the site of Tibes in Ponce, under the support of the Smithsonian Institution.

Damage to intangible cultural heritage (ICH)

One of the most important social impacts that both Hurricanes Irma and Maria had was the displacement of communities and death of community members. In the case of Barbuda, even when residents preferred to stay, the population was required or forced to evacuate to Antigua where they were placed in shelters or scattered among friends and relatives in Antigua or elsewhere (Simmons, 2017). Four months after Irma, Barbudan families were allowed to return home, but many families have preferred to remain away to allow children – composing half the population of Barbuda – to attend school given that Barbudan schools did not re-start teaching until late January 2018 (“A year after Irma”, 2018; “School reopens in Barbuda”, 2018).

In the case of Puerto Rico, it is estimated that between 114,000 and 213,000 Puerto Ricans will leave the island annually in the aftermath of Hurricane Maria (Meléndez & Hinojosa, 2017). It is still unknown how many have migrated inside the island, abandoning devastated and unsafe communities without water or electricity to relocate with friends or family in less damaged areas. Mathematical models estimate death tolls between 800 and over 4000 as direct or indirect effect of the hurricane (Kishore, 2018; Rivera & Rolke, 2018). The real count is unknown because many bodies are still unprocessed in the Puerto Rico Institute of Forensic Sciences, many deaths were not recorded, the relationship between the death event and the hurricane was not registered, and there is a serious lack of record keeping, transparency and data communication. Mortality, particularly of elders, has been significant. There have been accounts of elders having died at the time of the storm or immediately after it, and their families having had to bury them in their backyards because of lack of communication, transport, or hospital and funerary facilities (Holpuch, 2017; “Poor, elderly Puerto Ricans”, 2018; Silva, 2018; Vick & Gregory, 2018).

As people are displaced, local and traditional knowledges are affected, and the longer the displacement lasts, the more difficult it may be for people to reconnect to their landscape, traditions, and culture (Adger, Barnett, Brown, Marshall, & O'Brien, 2013). In Barbuda, traditions of horse breeding, hunting, camping, living in caves, beach festivities, traditional healing and construction of traditional houses are potentially endangered. Consideration must be made in regards to the currently displaced population of Barbuda in terms of continuation and transmission of their intangible cultural heritage, including expressions and practices, such as the endangered Barbudan dialect; religious services; sports; performances of the school theaters, steel band and other music; community news, radio and information (live morning broadcastings of JP Samuel, Gospel radio station); interruptions of practices and diet of Rastafarian community, and so forth. The Annual Barbuda Caribana Festival, which is comprised of five days of festivities including the Caribana queen show, talents and calypso competitions, food fair, dancing in the streets, beach games and festivities, and horseraces, were interrupted due to the damage to infrastructure, guesthouses, transportation, food facilities, festival space, festival office, equipment, furniture, and food carts. There was no Caribana in 2018 and a reduced version in 2019 due to a lack of funding. At this time horse racing has not started and the steel band is inactive. Conduction of other events including the Christmas Eve and the participation of school theater groups in the National Secondary Schools' Drama Festival in Antigua are endangered due to the loss of infrastructure, spaces, and equipment.

Data on existing crafts and artisans is insufficient. Unavailability of the raw material such as pink sand (for which Barbuda is known) might endanger handicraft tradition. Traditional collection of salt, production of honey and wine making (from black berries found on the north of Barbuda) are threatened. The few shops where the crafts were sold were severely damaged, including the Barbuda Tourism Department and Zabeth Handicraft Center.

Similar effects are expected in Puerto Rico, although given the larger population and spatial area of the island, the picture is more complex. The Hurricane demonstrated the role that heritage can have for resilience. Some communities and individuals have reclaimed historical infrastructure, such as cisterns, wells, and bridges, often against governmental orders, to supply their needs and achieve self-sufficiency. The loss of power also triggered the memory of self-sufficiency, such as the tradition of the *lavanderas*, hand-washing the laundry in rivers or at home with washing boards (Domonoske, 2017). Historical documents and events have been shared to develop comparisons and recover the memory of how Puerto Rico survived hurricanes in the past. People are also developing agricultural communities by recovering farming strategies of food production more focused on feeding residents rather than exporting cash crops like coffee and sugarcane (Bascomb, 2018; Holpuch, 2018).

Intangible heritage proved to be helpful during and immediately after the storm. Both in Puerto Rico and Barbuda people took refuge in caves that were locally known to have been safe refuges against hurricanes. In the case of Barbuda, the military forced the refugees off these shelters after the storm (Boger & Perdikaris, 2019). In Puerto Rico there are accounts of historic wooden storm shelters (*tormenteras*), dating from the 20th Century or earlier, being successfully used during Hurricane Maria (Fernós, Báez, Gil, & Vicente, 2018).

While people have shown a reliance on cultural traditions, at the same time Puerto Rico is losing intangible heritage (ICH). Consideration must be made regarding the displaced Puerto Rican population in terms of their ICH, including expression of practices and traditions. It is already evident that most popular festivals have been affected (Luxner, 2017; "Pretty lights' Puerto Rican festival", 2017). In the months following Maria, lack of power has meant that curfews were imposed at the few festivals that attempted to continue, prompting clashes between people and the police or the voluntary cancellation of many of these events, extending well past the usually-active Christmas season (Ferré-Sadurniet al., 2017; Moscoso, 2017). The efforts from the Institute of Puerto Rican Culture to preserve traditional forms of music and dance have been affected as performances had to be canceled. Other traditional activities, such as the Fiestas de la Calle San Sebastián, continued as planned.

The crisis also triggered opportunities, as new artisans have surfaced taking advantage of felled native trees for wooden crafts, and other post-Maria arts and crafts (Lyle, 2018). Long-distance networks with the Puerto Rican diaspora have been a source of resilience, as support has attempted to pour in (in spite of bureaucratic obstructions). Tapping into long-distance networks for support in times of crisis is a Caribbean tradition with roots stemming deep into pre-Columbian traditional practices (Capo, 2017; Rivera-Collazo, Rodríguez-Franco, & Garay-Vázquez, 2018).

Likewise in Barbuda, diaspora started to help cleaning up the debris in the town and assisted with the rebuilding of homes a few months after Irma hit and continue to assist at the time of this report (Hillhouse, 2018). The Internet has had a very important role in the activation and maintenance of these links, as extra-official response to the crisis could begin soon after the Hurricane, and traditional arts and crafts can be offered and sold in spite of damage to the physical shops where they had been usually marketed. At the same time, the unending crisis, the failure to restore power and water to thousands of people, the damaged infrastructure, the destroyed houses exposing thousands to habitat insecurity, the lack of federal and local help, and the mass migration extending livelihood insecurity to the mainland, continues to undermine Puerto Rican mental and social health as well as grassroots recovery efforts given that the magnitude of the need is so overwhelming that all help seems insignificant (Orengo-Aguayo, Stewart, de Arellano, Suárez-Kindy, & Young, 2019; Scaramutti, Salas-Wright, Vos, Schwartz, 2019).

5 Immediate and longer-term impact of the Hurricane

The magnitude of the impact that Hurricane Irma and Hurricane Maria had on Barbudan and Puerto Rican cultures can be expected to be transformative. While many of the displaced people might return to their island as conditions improve, it can be expected that many more will not. In the case of Barbuda, the Prime Minister of Antigua and Barbuda is leading an effort to remove the Barbuda Land Act privatizing the land that has been communally owned by Barbudans for more than two centuries. Post hurricane efforts have been focused on the excavation of pristine landscape for a large airport intended for planned high-end tourist resorts backed by wealthy business interests, rather than rebuilding the infrastructure for the residents (Klein & Brown, 2018). Little concern is given to the environmental and cultural impacts in the rush to move this project forward. The initial excavation for the airport bulldozed a large architectural site and was abandoned because the area is too cavernous. There were two other attempts before settling on the final location. In 2019, construction was discontinued and the equipment removed from continued cavern collapses even in the final location. The airport construction has destroyed prime hunting and farming areas and has likely impacted the inland water way that is an important refuge for animals during the dry season (Environmental Justice Atlas). For a large part, the Barbudans feel removed from the decision-making process for actions that will greatly impact where and in what way they will live, and how they define themselves as Barbudans.

In the case of Puerto Rico, the magnitude of the current flow of outmigration exceeds those of the first half of the 20th Century, which transformed the character of Puerto Rico both on the Island and abroad (Meléndez & Hinojosa, 2017). As people move or pass away, the intangible heritage that defines what it means to be Puerto Rican—the social memory that might or might not have been transferred to the next generations—is also gone. Mental health is also a serious problem, with suicide and attempted suicide rates palpably on the rise (Ramphal, 2018). Informal conversations reveal that most people know more than one person who either committed suicide or attempted to. Gender violence has also increased exponentially, to the point that governor Wanda Vazquez has responded to public pressure declaring a national emergency (“Gobernadora declara estado de alerta”, 2019). Within the context of displaced population and social instability, disaster capitalism has taken dominance over social well-being and cultural continuation.

Local movements and community activism have had to fight against all odds in an attempt to maintain local traditions, such as land ownership in Barbuda. It is yet unknown how much power local grassroots movements will have against large economic powers trying to take over the land and take advantage of the misfortune of the islanders. Legal action temporarily halted construction on the airport (Taylor, 2018) and a local resistance movement, Barbuda Silent No More (<https://www.facebook.com/barbudasilentnomore/>), uses social media to document and share developments on Barbuda. Similar processes of gentrification and displacement were documented in New Orleans after Katrina (Adams, 2013; Klein, 2007).

As the months and years since the Hurricanes are going by, it is apparent that for both islands, the disaster is not so much the physical impact of the atmospheric event, but the social crisis that has developed after it. In Barbuda the disaster is the poor relations with the sister island of Antigua,

external pressures for tourism development through land acquisition, and the political crisis that has emerged towards Barbudan culture and identity.

In Puerto Rico the disaster is the colonial relationship with the United States within the context of the social effects of hundreds of years of colonial and unequal relations even before US take-over and the treatment of Puerto Ricans as second-class citizens, as well as the severe corruption schemes within the politics of the island and the very deep social inequality that separates economic classes on the island.

Months and years after Irma, many Barbudan homes still have no running water and no electricity. The island still has no functioning hospital. Recovery efforts, however, demonstrate aggressive agendas towards development for tourism instead of community reconstruction. In Puerto Rico, even though power and water has been restored to most communities, some households are still waiting for these services. During 2017 and 2018, progress updates were only being communicated via de Twitter account of the Power Authority (PREPA). The road infrastructure is still severely affected. Many schools and businesses have been permanently closed, and there is a broad sense of need and despair. Access to reliable health services is also problematic throughout. The situation is worse for rural communities where people are still expecting significant support.

For both Barbuda and Puerto Rico, there is a disconnect between the priorities of governmental investment and action, and the needs of the community. These communities, currently in the most vulnerable state in the history of their islands, are being stripped not only from rights that have identified them, but also from key relationships with the intangible cultural landscape that is at the core of their identity. This disaster is an existential nightmare that might even reach the levels of cultural demise (Klein, 2018).

The identification of needs with the participation of concerned communities is required not only concerning the ICH affected by the hurricanes, but also with regard to those cultural expressions and practices to be mobilized by the population as essential resources for its resilience and recovery, in particular in displacement context. The hurricanes have transformed practices of daily life and their relations with time, space and geographic context. The emerging processes may take many different manifestations. As practitioners and academics it is our duty to record and actively participate in these processes as facilitators, careful recorders and researchers. We need to make information available to the people living there so that they can fight to maintain their cultural identity with data and facts. As a reaction to the hurricanes' traumas, tangible and intangible heritage will reflect evident change in its definition, purpose and scope, and can be expected to take a central role in the recovery process for the redefinition of culture after disaster.



Photo 1. Impact to Mound 1 of the Tierras Nuevas coastal ceremonial site in Manati, Puerto Rico. (Photo taken in 2018 by Fabio Esteban Amador).



Photo 2. Gunshop Cliff, Barbuda. Walls collapsed after Hurricane Irma. (Photo by Sophia Perdikaris).



Photo 3. Seaview archaeological site, Barbuda. Hurricane Irma removed coastal sand dunes and exposed skeletons. (Photo by Sophia Perdikaris).

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