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ISLANDS ON AN ANGRY EARTH

Climate Change, Disasters, and Implications for Two Island Communities

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Introduction

Drought is devastating the Fertile Crescent, reversing the 9,000-year trend that supported early agriculture with two decades of the worst aridity in at least 900 years (Cook et al. 2016). Arctic sea ice is disappearing, exposing shorelines to incessant waves and reducing the buffer from storms, leading to severe coastal erosion and threatening long-established communities and their subsistence practices (Overeem et al. 2011; Marino 2015). Unprecedented in the meteorological record, Hurricane Sandy was a hybrid storm combining a hurricane as it transitioned into a post-tropical cyclone with a powerful nor'easter that then wreaked destruction in cities and towns along the east coast of the United States in 2012 (Galarneau et al. 2013). Low-lying islands are losing ground to rising sea levels, which carry higher storm surges, tsunamis, and high tides further inland, initiating actions around relocation (Lazrus 2012, 2015). These and other anomalous weather and climate events are occurring against a dynamic backdrop of climate change, which has emerged as one of the greatest threats of our time. While weather and climate extremes are, by definition, anomalies, the unlikely character of increasing numbers of hydrometeorological hazards, such as the expanding drought, diminishing sea ice, severe and unusual storms, and coastal inundations, reflects the planet's rapidly changing climate due to anthropogenic influences (Field et al., 2012).

Decades of research have exposed the numerous ways in which disasters are mutually constituted by environment and society (Oliver-Smith 1996, 1999). As an intensifier of disasters, climate change is above all an ecological manifestation of the social, political, and economic processes that characterize global society. Climate change is driven, literally, by our thirst for fossil fuels, and its variegated consequences fall most heavily on those with the least economic and political power. Small island-dwelling communities are among those most at risk from disasters precipitated by climate change, and are also those taking real actions to maintain their livelihoods and cultural integrity. Because islands are simultaneously isolated by water and connected globally by water-traversing materials, ideas, and values, they exemplify and accentuate the ways that climate-change-driven disasters are products of environment and society (Hau'ofa 1994; Lazrus 2012).

Anthropologists are at the forefront of centering people and their practices in understanding the causes and consequences of climate change, particularly as climate change is experienced through disasters (Fiske et al. 2014). In doing so, anthropologists rely heavily on theories related to risk, vulnerability, and adaptation that have been developed over the past five or more decades by interdisciplinary hazards scholars (e.g., Lewis 1990; Watts 1983; Wisner et al. 2004). By situating weather- and climate-related disasters in the context of climate change, anthropologists connect apparently discreet disaster events to the chain of land use change (e.g., Moran et al. 2005; Turner et al. 2007), fossil fuel production (e.g., Maldonado 2018), greenhouse gas emissions (e.g., Strauss et al. 2013), consumption patterns (e.g., Wilk 2009), scientific processes (e.g., O'Reilly 2015), and local and international policies designed to address climate change causes and consequences. Anthropology's holistic perspective—which considers how each of these links in the chain are interconnected, and situates them in broader social, political, and economic contexts as well as specific local and cultural settings—and cross-scale analysis makes it well suited to the study of disasters in the context of climate change (Fiske et al. 2014).

In fact, descriptions of weather- and climate-related disasters have long been part of the ethnographic record and are the basis of much early anthropological theory, which, from the onset, connected risk and vulnerability to larger processes such as modes of production and cultural worldview. For instance, Raymond Firth described the social as well as environmental causes of famine among islanders on Tikopia in the Solomon Islands (Firth 1936). Building on Firth's example, Marshall Sahlins described the *Crise révélatrice*, a revelatory crisis, or disaster, that exposes the inherent contradictions in modes of production (Sahlins 1972: 124). Along similar lines, Margaret Mead explained the ethnographic pertinence of disasters: "A storm, an earthquake, a fire, a famine—these are extraordinary conditions that sharply reveal certain aspects of a people's conception of life and the universe" (Mead 1993: 271). Anthropological inquiries of disasters born of climate change now also reveal the inherent values, inequalities, and contradictions of contemporary capitalism and governance, charting broader processes that entangle seemingly marginal communities and fragile ecologies in broader global processes.

This chapter begins by summarizing the links between climate change and disasters, and then charts the ways in which the theoretical underpinnings of anthropology of disaster extends to our interrogation of disasters precipitated by the planet's changing climate. Next, the chapter reviews anthropological framing of risk and vulnerability that are particularly revealing of the ways in which islands are enmeshed in broader processes of planetary change, belying notions that islands are isolated or disconnected from broader ebbs and flows. These ideas are illustrated with two case studies—Gunayala, Panama, and Nanumea, Tuvalu—that demonstrate how island communities are experiencing climate-driven disasters and engaging in global political processes to address climate change.

Climate Change and the Amplification of Disasters

The current rate of climate change being driven by human activity far exceeds natural rates of change. The average global temperature over both land and oceans rose 0.85°C between 1880 and 2012 (Stocker et al. 2013). While the trend of rising temperatures likely began earlier, it was not until the late nineteenth century that the curiosity and ability to track temperatures provided the instrumental record to verify the rise. Rising temperatures reflects increases in

greenhouse gas emissions in the planet's atmosphere that each of the three major periods of the mid-nineteenth century (1850–1870, 1880–1910, and 1920–1950) show current rates for another five decades. The instrumental records that far predate the modern era was that warm, sea levels rose, global temperature increased in magnitude, and location of climate change. Increasing warm temperatures are driving the live. Because interconnections well as "creeping environmental change" discrete weather events is driving the live change is driving the live.

Hurricane Sandy illustrated the forecasted, in particular the ECMWF. The ECMWF's weather models and including its unusual left-hand side was the temperatures that were 1–1.5°C warming caused by climate change. Anthropogenic climate change the amount of precipitation on the east coast of the United States it would have been without.

Climate change enters into ties, cultures, and political capacities to anticipate and has been dubbed a "threat to risks, create new risks, and economic and political events in the climate system. The consequences of climate but rather as linked inter through both ecological and

Applying an Anthropological

The interrelated concept and contextualizing disasters. These concepts have emerged and policy in anthropology and the risks that they social constructions" (O'Brien perceived when one's work

greenhouse gas emissions, from fossil fuel combustion and land use change, which trap heat in the planet's atmosphere. The Intergovernmental Panel on Climate Change (IPCC) reports that each of the three most recent decades has been warmer than any other decade since the mid-nineteenth century (Stocker et al. 2013). If we continue to produce greenhouse gases at current rates for another five decades, temperatures will rise about 5°F. We know from geological records that far predate our instrumental record that the last time the Earth's temperature was that warm, sea levels were also eighty feet higher (Hoffman et al. 2017). Accompanying global temperature increases are many other changes that are affecting the frequency, magnitude, and location of disasters including decreasing cold temperature extremes, increasing warm temperature extremes, and increases in heavy precipitation (Stocker et al. 2013). Because interconnections between climate, land, and water are not linear, abrupt changes as well as "creeping environmental problems" will occur (Glantz 1994). Scientific attribution of discrete weather events is improving, solidifying what many are already observing: that climate change is driving the lived experience of extreme weather events (Otto et al. 2016, 2017).

Hurricane Sandy illustrates the influence of climate change on storms. Sandy was well forecasted, in particular by the European Center for Medium-Range Weather Forecasts (ECMWF). The ECMWF performed several predictions of the storm using a suite of numerical weather models and modifying certain variables to determine the most likely track, including its unusual left hook into the coast. One of the variables that the ECMWF scientists modified was the sea surface temperature. Under scenarios that used sea surface temperatures that were 1–1.5°C cooler than observed temperatures (effectively removing the warming caused by climate change), the storm track did not move drastically west and inland. Anthropogenic climate change was also shown to increase the depth of the storm as well as the amount of precipitation it carried by up to thirty-five percent. The storm surge that the east coast of the United States experienced from Sandy was nineteen centimeters higher than it would have been without the influence of climate change (Trenberth et al. 2015).

Climate change enters a world that is already patterned by difference—different societies, cultures, and political and economic systems. This variegation contributes to differential capacities to anticipate and cope with impacts of climate change. As a result, climate change has been dubbed a "threat intensifier" that will exacerbate climate variability, amplify existing risks, create new risks, and intensify threats that may not be directly climate related including economic and political struggles. Just as climate change shifts the distribution of extremes events in the climate system, it redistributes the lived experience of risk. Moreover, the negative consequences of climate change cannot be considered as isolated, individual shocks, but rather as linked intensifying, cumulative, and compounding disturbances that feed back through both ecological and human systems (Wrathall et al. 2015).

Applying an Anthropological Toolkit to Navigate Vectors of Change

The interrelated concepts of risk, vulnerability, and adaptation are integral to understanding and contextualizing disasters in the longer term and broader processes of a changing climate. These concepts have emerged over the past several decades to frame climate change discourse and policy in anthropology and beyond (Fiske et al. 2014). Anthropologists understand disasters and the risks that they harbor as material manifestations of "interwoven, often conflicting, social constructions" (Oliver-Smith 2002). According to the cultural theory of risk, risk is perceived when one's worldview is challenged (Douglas 1966; Douglas and Wildavsky 1982).

In this sense, risk is primarily about how society is structured and organized, and how that organization interacts with physical hazards. How risks are identified and responded to reveals cultural norms and moral underpinnings. Risks associated with climate change may be very different depending on whether they are perceived by those invested in fossil fuel production or by those worried about the future of their nation.

Vulnerability encompasses many complex and interconnected cultural, social, economic, political, and environmental processes interacting over time and across space, making it difficult to define succinctly (Thywissen 2006). Anthropologists treat vulnerability as the sum of multiple cultural, social, economic, and political processes and their interaction with environmental forces (Oliver-Smith 2004). It is not adequate to define vulnerability as the product of particular sociodemographic characteristics and hazard exposure, but rather as the outcome of what particular characteristics may mean in terms of broader economic and political structures that delimit access to economic, political, and natural resources (Wisner et al. 2004). Anthropologists also understand the ways in which vulnerability is not monolithic or static, but encompasses capacities and agency in complex and dynamic interactions with power. Communities that are facing ecological devastation due to fossil fuel extraction and climate change impacts are harnessing unique capacities to address risks they view as untenable.

Adaptation is perhaps the concept most used by anthropologists, even beyond work on disasters and climate change. It has been a core concept used to understand human biological and cultural evolution since the emergence of the discipline (Harris 1980). Applied to understanding human experiences of disasters in the context of climate change, adaptation refers to the developments humans make in order to thrive, including belief and knowledge systems, modes of production, and technologies. Anthropologists understand that human adaptation is not limited to technical solutions (Crate and Nuttall 2009; Roncoli 2006), but, as with risk, vulnerability, and resilience, exists within social and cultural parameters. Climate change has the potential to undermine primary adaptive strategies by changing weather patterns and resource availability. Communities in fragile ecologies facing deeper disruptions from climate change are considering relocation, and anthropologists are working hard to understand ways in which relocation happens to support adaptation, as opposed to a failure to adapt in situ.

Islands of Change

Islands are sites of continual transformation as their coastlines literally accrete and erode with the waves that arrive on their shores. Pacific anthropologist Epeli Hau'ofa offered a reconceptualization of islands as interconnected constellations of places—a “sea of islands”—in contrast to the notion of vulnerable, isolated, and small “islands in a far sea” (1993, 1994, 1998). According to Hau'ofa (1993: 6) “the idea of smallness is relative; it depends on what is included and excluded in any calculation of size.” This perspective emphasizes that islands are also not isolated regardless of how remote they may be cartographically. Instead, island communities may be all the more dynamically connected to global flows because of the work that goes into maintaining transboundary cultural, social, economic, and political connections (Lazrus 2012). For this reason, islands are particularly revelatory sites to chart how global systems become reified as locally situated disaster risks, vulnerabilities, and adaptation options or constraints (Marino and Lazrus 2015).

Climate change has arrived on the shores of islands like Nanumea, Tuvalu, and Gunavala, Panama, in the form of coastal inundation from storms and tides, and raises difficult questions

about displacement in particularly important settings. Resettlement discussions are ongoing for the island of Nanumea off the eastern coast of the Pacific community. Despite geotectonic displacement span the spectrum, the issue is not just about infrastructure, but also integrity, human rights, legal citizenship. Such a situation has levels of impacts from knowledge, culture and

Tuvalu

The interrelated concept of a distinct island community in the archipelago of nine islands in the Pacific equator (Figure 19.1). The island is predominantly Polynesian descent.

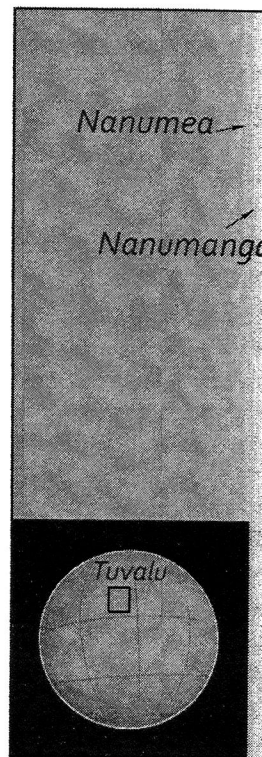


FIGURE 19.1 The Pacific

about displacement in the face of associated risk and vulnerability. Tuvalu and Panama are particularly important settings in which to explore climate-related community displacement and resettlement discussions. Tuvalu is an independent nation-state while Gunayala is an archipelago off the eastern coast of Panama, a semi-autonomous territory of the Guna indigenous community. Despite geopolitical differences, in both cases, opinions and actions about resettlement span the spectrum from proponents to opponents. And in both cases, resettlement is not just about infrastructure, but also about deep place-attachment, livelihoods, cultural integrity, human rights, and a sense of belonging which, in Tuvalu, extends to implications for legal citizenship. Such characteristics expose residents of these places to specific types of risk and levels of impacts from climate change displacement, including loss of identity, traditional knowledge, culture and customary livelihoods.

Tuvalu

The interrelated concepts of risk, vulnerability, and adaptation are particularly visible in the distinct island communities of the Pacific island nation of Tuvalu. Tuvalu is comprised of an archipelago of nine islands and atolls arcing across the Pacific Ocean between Fiji and the equator (Figure 19.1). The national population hovers around 11,000 people of predominantly Polynesian descent, who thrive on a largely subsistence-based economy anchored on

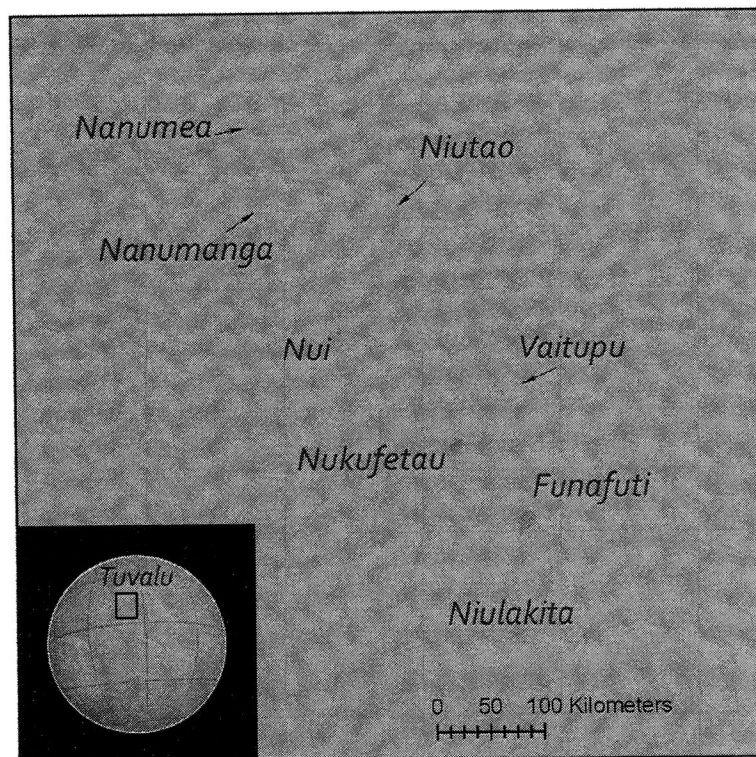


FIGURE 19.1 The Pacific Island Nation of Tuvalu, including the northernmost atoll of Nanumea.

pelagic fisheries and atoll agriculture consisting of growing coconut and taro, and raising pigs. Saltwater incursion from chronic sea level rise and acute storm surges or high tides, warming sea surface temperatures, and shifting precipitation patterns are the primary climate change impacts being observed in Tuvalu. The Tuvaluan Meteorological Service recorded a maximum tide of 3.4 meters in February 2006 and again in February 2015, a change particularly alarming in a country with an average elevation of just 4.6 meters above sea level. People on Nanumea, the northernmost island community of Tuvalu, are experiencing numerous changes from these climate-driven impacts, including coastal erosion and reduced freshwater availability. Together, these lead to fears about *te mafulifuliga i te tao o aso*, a phrase that does not translate fluidly into English but appropriately refers to changes in both the state of the weather and to the state of society.

Risk is seen to arise not only from the encroaching tides and diminishing rainfall, but also from increasingly Western-style consumption practices on the island that both drive mining of coastal coral materials for concrete and purchasing of store-bought food in packaging that does not leave the island. For Nanumeans, vulnerability arises when some members of society amass more power than others, and when nature loses its precarious balance with society, a balance that is highly adapted to atoll-based livelihoods. Yet, although highly vulnerable to storm impacts under a changing climate, Nanumeans demonstrate resilience in their daily lives by maintaining strong community solidarity expressed in their often-referenced motto, "unity of heart."

Nanumeans are also developing adaptations to limited water resources. These include increasing water storage through household water tanks and community cisterns, and complying with water rationing during times of drought. Responses to coastal erosion include fortifying coastal revetment projects, relocating inland and building away from coasts, and elevating buildings on poles above ground level. Migration is another potential adaptation that has begun to be discussed in Tuvalu (Farbotko and Lazrus 2012). However, there are meaningful limitations to migration as an adaptation response in Tuvalu. Pacific Islanders have a long cultural tradition of population movements. Tuvalu was originally settled by Polynesian seafarers, and networks of movement now continue to enmesh Tuvalu in broader networks of economic, education, and health care opportunities. Yet, full-scale relocation that would involve stepping outside of culturally meaningful temporary or permanent migration practices and that challenge the citizenship, sovereignty, and cultural integrity of a nation of people constitute a derivative disaster rather than an adaptation.

At the heart of much anthropological engagement with the disastrous manifestations of a changing climate lies the interrogation of deep injustices and inequalities. For instance, the Pacific islands region is home to 0.12 percent of the world's population and stands to be among the first and most drastically affected by climate change, but accounts for approximately just 0.03 percent of the global emissions of carbon dioxide from fuel combustion.

Internationally, strategies to mitigate climate change have given way to strategies to adapt to its impacts as the levels of greenhouse gases currently in the atmosphere mean that the planet is already committed to significant changes. Adaptation strategies have in turn begun to address some degree of climate justice, but this remains a largely unacknowledged idea within international climate policy. The international community currently pursues climate justice through financial compensation in recognition of the unequal distribution of historical and current emissions and of the impacts. Mechanisms such as the Global Facility for Disaster

Risk Reduction allow marked for adaptation v

Although a country the early 2000s as housi role in exposing dispar justice for those with ne attention and political plight in a changing cli ily in Tuvalu, was acting (AOSIS). AOSIS, an ass in 1990, is a collective o house gas emissions and plays a pivotal role in s ages suffered in develop Small Island Developing on Climate Change (U with the loose commit reducing greenhouse ga in 2012, Tuvalu again pl and Damage, to at least j responds to the reality i adapted to, that are full-f cannot be mitigated (W

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The Guna of Gunaya

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Risk Reduction allow for burden sharing among developed nations to transfer funds earmarked for adaptation within less developed nations (Mechler and Schinko 2016).

Although a country largely unknown internationally before making media headlines in the early 2000s as housing the world's first "climate refugees," Tuvalu now plays a significant role in exposing disparities highlighted by climate change and its impacts to seek climate justice for those with no voice (Farbotko and Lazrus 2012). Leveraging the newfound global attention and political savvy, Tuvaluan politicians began raising awareness of the country's plight in a changing climate in the 1990s. Enele Sopoaga, from a politically engaged family in Tuvalu, was acting chairman from 2005 to 2006 of the Alliance of Small Island States (AOSIS). AOSIS, an association that was formed at the Second World Climate Conference in 1990, is a collective of low-lying island and coastal nations that advocates for lower greenhouse gas emissions and negotiates on behalf of these counties at the United Nations. AOSIS plays a pivotal role in seeking financial compensation for climate-driven losses and damages suffered in developing and low-emitting countries. In 2009, Tuvalu led the coalition of Small Island Developing States to stall talks at the United Nations Framework Convention on Climate Change (UNFCCC) conference in Copenhagen because they were dissatisfied with the loose commitment on the part of developed countries to binding agreements on reducing greenhouse gas emissions. At UNFCCC conferences in Durban in 2011 and Doha in 2012, Tuvalu again played an active role in proposing a policy framework, known as Loss and Damage, to at least partially address climate injustices. The Loss and Damage Mechanism responds to the reality that there are already climate impacts that cannot be mitigated nor adapted to, that are full-fledged disasters whose risks cannot be reduced, and whose outcomes cannot be mitigated (Wrathall et al. 2013; Meschler and Schinko 2016).

Tuvaluan leaders call for significant shifts in international climate change policy concerning mitigation, sovereignty, and resettlement. Resettlement, says Enele Sopoaga, the Tuvaluan prime minister, is not adequate as "[climate change] is much bigger than ourselves, so we really have to contextualize it" (Radio New Zealand 2017). Previously, he has stated, "We are not dealing with sovereignties any more—there are no boundaries to the effects of climate change. ... We are dealing with saving human lives—and therefore saving Tuvalu is also saving the world" (ABC News Australia 2014). Tuvaluan's strong place attachment and fierce commitment to human rights underscores that population resettlement is neither easy nor adequate, and that climate change entangles even the seemingly most remote islands in global webs of power and environmental change. Responding to climate change is not only an exercise in basic adaptation but also broad-scale nation building and securing broad human rights that extend beyond territorial claims to sovereignty.

The Guna of Gunayala

The Guna of the San Blas archipelago are perhaps the most well-known indigenous group of Latin America for the defense of their culture within the context of the nation of Panama. For several centuries, they inhabited the forests of the Darien region and the San Blas mountains, but finally settled in a long strip of land between the mountains and the Caribbean Sea, currently known as Gunayala (Figure 19.2). In the mid-nineteenth century the Gunas began moving to some of the 371 small coral islets along the Caribbean coast, in what is known as the San Blas Archipelago, mainly to escape from the endemic malaria and yellow fever on the mainland. They settled on those islets that were closest to the mainland and near the mouths

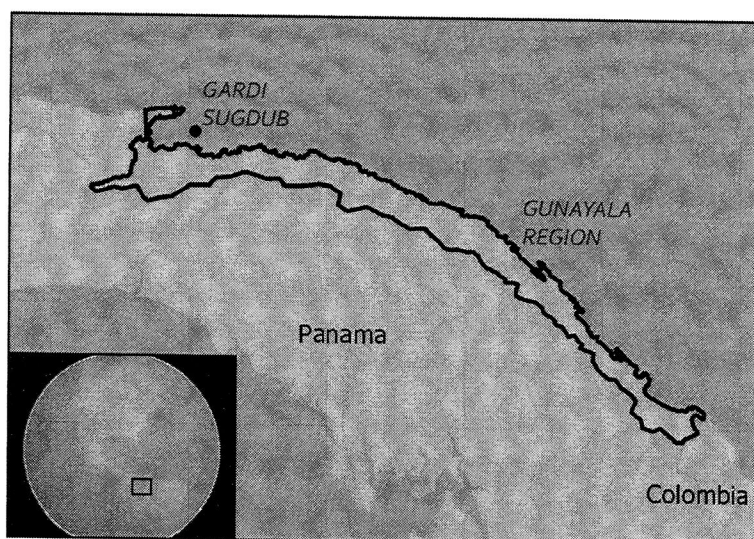


FIGURE 19.2 Gunayala and the community of Gardi Sugdub.

of rivers. Today they farm crops, hunt, and access water from rivers on the mainland, while living on the islets and engaging in fishing and tourism guiding.

Historically the Gunas have resisted all efforts at colonization, successfully protecting their territory from colonial powers, pirates, small settlers, large entrepreneurs and even state officials. Today the Guna still maintain landholdings on the mainland that are farmed for subsistence crops to supplement their livelihoods from fishing, and now, increasingly from tourism to their region, well known for pristine island beaches, abundant sport fishing, and the beautiful fabric art called molas produced by Guna women.

Over the last fifteen years a series of weather-related events and disasters have highlighted the issues of rising sea levels and climate change, making the relocation of communities from the islands to the mainland an increasing priority. Population growth over several decades has also led to serious overcrowding on the islands and is a contributing factor to the need for relocation. It is estimated that approximately 28,000 people will eventually have to relocate from the islands to the mainland as a result of rising sea levels and climate-related events in the years to come. In addition, a further 12,000 people originally from the Gunayala islands who have moved to Panama City are expected to join the relocation back to their home province, bringing the total number to some 40,000 people (Displacement Solutions, 2014).

As elsewhere in the world in cases of climate change and hazard intensification, the possible outcomes of displacement and relocation, including Tuvalu, many of the Gunayala communities struggle with the idea of resettlement. While not all Guna communities are ready to relocate, some have taken concrete steps toward that end.

In 2010, the community on Gardi Sugdub (Island of the Crab) island, faced with growing population density, rising sea levels, storm surges, and flooding decided to relocate to the mainland and created a "neighborhood commission" to organize the relocation process. In 2014, 200 families ($\pm 1,000$ people) from Gardi Sugdub and another 100 migrant families living in Panama City had signed up to be relocated to the mainland. After the 2010 decision, the community acquired seventeen hectares of land through donations from several families

from the community and government agencies for a project to build new houses.

The ministry of housing and construction is working on the construction of municipal buildings. The projects in rural communities are also traditional Guna houses. The pressure from the government and pressure from the community for their relocation, the houses. As of today, there is still uncertainty about the future of the community.

Unlike Tuvalu, where the actions taken to address the land availability, public health is a key issue in addressing the need for new land to start the process of providing land and housing for a school for 1,200 students to attract migrants to the islands. It is to be found not only in the communities facing the issue.

Public health is an issue on the islands was to escape the issue about relocation to the mainland. Steps to address the issue are needed. Planning for the settlement of thousands of people is a challenge.

The right to access the land is a key issue. After relocation to the islands because of the issue of fishing and, increasingly, tourism. Gunayala is now entering the industry. The current subsistence-based to a new way of life during the relocation to the mainland. However, the income-generating move. In addition, the loss of traditional environment may be at risk in resettlement.

Finally, since some of the need to be carefully planned for the seasons the effects of climate change and flooding.

Island communities are navigating the challenges of climate change and disaster risk reduction.

from the community for the new settlement. The committee also approached different governmental agencies requesting support, and secured agreement from the Ministry of Housing for a project to build the first sixty-five houses at the relocation site.

The ministry designed a plan for the project, which included housing, roads, and communal buildings. The houses proposed by the ministry followed a design used in other projects in rural communities in Panama, which failed to consider the cultural characteristics of traditional Guna houses and were summarily rejected. As a result of the continued activism and pressure from the Guna as well as the increasing interest at the international level for their relocation, the Panamanian government expanded its housing offer in 2016 to build 300 houses. As of today the construction of the houses has not yet started and there is considerable uncertainty about the future of the project.

Unlike Tuvalu, where resettlement has not reached the stage of concrete action planning, the actions taken thus far in Gunayala point to several specific outstanding issues including land availability, public health, access to livelihoods, and timeframe of relocation. Land is a key issue in addressing climate displacement. Inevitably, people will lose land and will need new land to start their lives over. The Gardi Sugdub relocation project already planned will provide land and housing for only a portion of those wishing to relocate, but the presence of a school for 1,200 students funded by the Inter-American Development Bank will surely attract migrants to the settlement, a factor not considered in the project. More land will have to be found not only for the people of Gardi Sugdub, but also for the more than forty other communities facing similar threats.

Public health is another serious concern. Since the original reason the Guna settled on the islets was to escape the endemic malaria and yellow fever on the mainland, there is concern about relocation to the mainland because these mosquito-related diseases are still present in the area. Steps to address these public health issues, including vector management measures, are needed. Planning will also be needed for the impacts over the longer term of the potential settlement of thousands more people in the most well-preserved forest area in Panama.

The right to access and maintain livelihoods will determine the success or failure of relocation. After relocation to the mainland, affected communities will continue to maintain links to the islets because they are the current sources of the community's livelihood, principally fishing and, increasingly, tourism. As Tuvalu is already inserted into international networks, Gunayala is now entering into the regional and global circuits of exchange of the tourism industry. The current economic situation of the Guna, however, is fragile, since a shift from a subsistence-based to a service-based economy is underway. Maintaining access to traditional ways of life during the transition process will assist in the adjustment to new opportunities on the mainland. However, support will be needed to assist with the development of new labor and income-generating skills so that their livelihoods will not be negatively affected by the move. In addition, livelihoods are not just income-generating activities, but also repositories of traditional environmental knowledge, social organization, and cultural identity, all of which may be at risk in resettlement.

Finally, since some communities are reluctant to move, the timeframe for relocation will need to be carefully planned. While the threat of rising sea levels will be gradual, during some seasons the effects of coastal storms will be seriously intensified, resulting in dangerous surges and flooding.

Island communities facing both slow and chronic as well as rapid and acute climate-driven disasters are navigating turbulent waters of adaptation and resettlement actions. Resettlement

can have both positive and negative aspects. On the positive side, it can represent an important protection for vulnerable communities that would otherwise be left to their own devices. On the negative side, relocation can divide communities, presenting very difficult decisions for people to make, especially when they have deep historical roots in a place. Moreover, the track record of resettlement associated with large infrastructure and development projects is poor. However, marginally better results for disaster-induced displacement and resettlement suggest that there is hope for improvement. Resettlement not only relocates a people in space; it also remakes them. When a community is relocated, it is generally reconfigured in specific ways, involving a restructuring of social, economic, and political relationships toward resembling those of the larger society.

Vulnerability and risks source from causes that extend far beyond the boundaries of an island, or any locale, and manifest locally to constrain options and opportunities. At the same time, communities, households, and individuals leverage adaptive capacities that may also stem from global interactions or from place-based knowledge and practices. Such adaptive capacities belie any notion of vulnerability as all-consuming and monolithic. As Hau'ofa's "sea of islands" illustrates, the global processes that surround island communities can be both diminishing and empowering forces.

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AFTER ATLAS

Cultural Persistence
Context of Disaster

Susanna M. Hoffman

In every scientific inquiry, there is a course. In the field of disaster and society change ... or ...

The question is a burning debate. Its import emerges from leaders, dealers, and brokers after a calamity pique perspective, betoken opportunity. The question fires up long-run social change in general, to perhaps to fine-tune theory. For mitigation of future disaster.

For the victims of calamity, is whether they can return to a life that is not fated to linger in a sea of disaster. The experience they endured is low? The wider inhabitant shift to a new social and ecological. Change or no change entails up in the amalgam of a disaster.

The concern extends to the fact, looms large. Due to the habitats, more perilous technological, tragic consequence to the homogenization of human life. The homogenization of human life with the intense exploitation of the capacity of people to adapt to change.