

Climate Change and Other Catastrophes: Lessons from Island Vulnerability and Resilience

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This photo essay, with all the photos taken by the author, examines how climate change is intertwined with other catastrophes experienced by island communities. The lens is the intersection of vulnerability and resilience, and consolidates lessons from island and disaster literature, that is, writing which incorporates climate change and which represents my own principal interests and publications.

I started my academic career by deliberately seeking to meld island research and disaster research, always including the issue of climate change but never letting it dominate my projects. Through these projects, I have been fortunate to have travelled to islands around the world, thankfully rarely after a disaster. I sought to understand vulnerability, islands, and islanders on their own terms in order to try to avert catastrophes before they strike or to reduce their impacts.

Photography is one medium through which I have explored and learned about islands and islanders, and how to use knowledge and wisdom in order to act regarding island vulnerability and resilience. My photos try to capture the hour-to-hour and millennium-to-millennium characteristics of island life – the good, the bad, both, and neither. Seeing island communities through a camera lens further assists me in exploring less-travelled topics and less-noticed corners, while also discovering afterwards layers and connections that I had not noticed when on-site.

Insert Photo 1.

The memorial in Photo 1 is on Malé, the capital of the Maldives, and is a peaceful place to contemplate the sea—the sea which might rise under climate change with potential for making the country uninhabitable. The memorial commemorates the tsunami of 26 December 2004, another ocean-based hazard which resulted in forced migrations when islanders were moved from their ruined habitations to newly built ones on other islands. The framing of this photograph tries to capture some of the powerful questions the memorial asks of us: Do the bars represent an island prison surrounded by the hazardous ocean? Does the islander outside that prison represent the freedom of choice which islanders have in retaining the ocean as a resource—as part of themselves, their life, and their identity—despite its hazards?

The sea confines and liberates, it connects and separates, it gives life and brings death. As the Bajan poet, Frank Collymore, wrote in ‘Hymn to the sea’: ‘Like all who live on small islands, I must always be remembering the sea.’ Those memories will

intertwine positive, negative, and neutral perspectives on living with hazardous environments, turning from catastrophe to opportunity to what just is.

Vulnerability and resilience: physical challenges to islands

The island and disaster literature which has most inspired me defines vulnerability as dependent on long-term human behaviour, values, and decision-making that create and maintain conditions leading to detrimental consequences.¹ In parallel, not in contrast, with experiences of vulnerability is the resilience process, which is defined as long-term human behaviour, values, and decision-making that create and maintain conditions supporting healthy and safe communities.² These concepts have been starkly illustrated to me in my island-related field work, and through the island case studies which helped to found and move forward many aspects of this science.³

The vulnerability process and the resilience process as seen from the perspectives of island communities take on particular poignancy in relation to the challenge of contemporary climate change. For islands, this is frequently connected to sea-level rise, as in the Maldives, whose government famously held a cabinet meeting under water in 2009 to highlight the impact of climate change. Low-lying islands are often seen as being highly vulnerable to sea-level rise, even though the empirical evidence available usually does not (yet?) support such contentions.⁴ This does not preclude challenges in the future, however, and I think we need to be creative in considering longer-term strategies for resilience—really thinking about the one-, ten-, hundred-, and thousand- year timescales in tandem—rather than ad hoc or short-term measures through structures such as sea walls which tend to be built more for their visibility and rapid ‘solution’ than for their long-term effectiveness.

For me, the important part is to think beyond the structures in order to realize the difficulties which can arise through relying on structural defences. Photos 2 and 3 illustrate the engineering challenges of construction and maintenance which can emerge from sea defences, as in the case of Tongatapu, Tonga and Brownsea Island, Dorset, UK, respectively.

Insert Photo 2.

Insert Photo 3.

The engineering challenges mentioned above can be overcome with adequate resources and governance—neither of which is necessarily available, particularly in contexts where there has been long-term exploitation and underdevelopment. Furthermore, social problems from relying on artificial structures occur, such as ‘risk transference’.⁵ While structural defences can make flooding less frequent, they tend to increase flood vulnerability because people believe that they are protected fully, so flood risk reduction measures are neglected.⁶ When the defences fail in the long term,

flood damage is much greater than if the defences had never been built: in other words, the risk has been transferred into the future. In contrast, raising land, raising and retrofitting infrastructure, floating dwellings, amphibious dwellings, and moving out of flood plains have all proved more successful for adjusting to sea flooding.⁷

Yet these approaches are not feasible for islands that become entirely flooded. Instead, the people will be forced to move—not just the individuals but also their cultures, identities, and homes. Even if land is ceded to relocate an entire state or mobile island states are created which roam the seas, that cannot be done without significant social challenges and changes.⁸

Vulnerability and resilience: social challenges to islands

If the physical impacts of climate change do become as severe as the literature suggests, then major changes to island societies will result. Communities, entire island populations, or entire countries might need to leave their homes permanently—not necessarily just for sea-level rise, but also potentially owing to diminishing freshwater supplies, dying coral reefs, and reduced food security. Where communities re-settle, they face a dilemma in terms of either trying to retain their original identity, sovereignty, and culture, or assimilating entirely or in some form the host culture. Whichever option is negotiated, or forced upon the communities, major moral, legal, and cultural challenges emerge.⁹

Cropover in Barbados is celebrated annually at the beginning of August as part of the island state's culture and identity. The festival, costumes, and dancing—with winin' shown in Photo 4—have Bajan elements, yet also represent the Eastern Caribbean more generally. Many from other countries— Islanders and non-Islanders—join the fun, bringing their own cultural flavours.

Insert Photo 4.

Improved transport links and increased affluence lead to increased Caribbean tourism. As a result, how do the identity and culture embedded, for example, in *Cropover*—in being Bajan, Caribbean, and 'islandy'—change? These social changes occur irrespective of climate change. Yet tourism contributes to climate change through the fuel required to travel to and from the island and the resources which tourists demand while there.¹⁰ What is the balance between changes to islands from climate change and changes to islands from other external forces such as tourism? Should the Islanders make money from tourism before climate change causes major problems, and then leave their island when these problems arise?

The dominant groups in the eastern Caribbean today are descendants of forced migrants—unwillingly brought to the islands as slaves. On Barbados, I was told that houses have names rather than numbers, a practice from the days of slavery when the

occupants might be forced to pick up and move at any time if they were sold or traded to another slave-owner. Thus, they could pack up and move their house, retaining the name and not worrying about the address changing, with mobility being a part of life. Islanders in the Caribbean and Pacific have always been adaptable migrants.¹¹ Historically, many populations were active settlers, searching for new land and for adventure, while in modern times people move for livelihoods, education, family, and new experiences.

Such adaptability does not, however, justify forced migration owing to climate change. And none of this diminishes the tensions facing many Caribbean and Pacific islanders in that their cultures are founded on the basis of migration, yet they are now trying to retain their homes and identities on their islands in the face of social and environmental pressures. Such tensions raise serious questions about the scale of cultural impact if climate change or other hazards, such as volcanoes and tsunamis, force migration.

Is migration to be deemed catastrophic or is it part of a long-term story of islander culture and history? For me, the key is power and choice. Whether islanders choose to migrate, or not to migrate, that is their choice and they should not be criticised. Where migration is forced, particularly for human-induced reasons, such as nuclear bomb testing or climate change, deeper ethical questions surrounding power and choice emerge.¹²

Iconization of catastrophe through islands —and vice versa

Islands are frequently iconized for their vulnerability and resilience, particularly with respect to catastrophe, with climate change high on the agenda. Islands are said to be vulnerable and resilient, often for the same reasons and often with stereotypical overtones. The table below exposes some of these stereotypes and contradictions, whereas a subtext within many of my scientific publications, popular science articles, and photos is to show that reality is rarely as straightforward as simple academic models would have us believe—emulating, for example, Godfrey Baldacchino’s approach to island entrepreneurship.¹³

Examples of stated vulnerability and resilience characteristics of islands

Characteristic	Vulnerability	Resilience
Small size and limited resources	Small land area means limited potential for land-based activities.	The ocean area is huge with immense sea-based resources.
Small populations	Needed skills and expertise might not be available. Closeness of community can breed pettiness and mistrust.	Tightness and kinship can breed trust and rapid reaction to adversity.
Insularity,	Being far away can mean lack	Lack of external help can

remoteness, and marginalisation	of awareness and interest in others. Goods and services can be difficult and expensive to acquire and import.	promote self-help without relying on outsiders. Knowing the time and distance for external resources to arrive can lead to fully developing local resources.
Poor livelihoods	Poor resources, a small skill base, and few training opportunities can mean limited and non-lucrative economic and non-economic job opportunities.	Isolation and necessity can breed creativity and innovation. Smallness can mean uniqueness (e.g. stamps, medals, tourism) which yields opportunities.

The implications for iconizing catastrophe on islands through vulnerability and resilience emerge from the overlaps and contrasts between vulnerability and resilience. Islands are seen as vulnerable because dealing with extremes is difficult and external aid is not always forthcoming. Islands are seen as resilient because they are used to dealing with extremes on their own. If the islanders must leave their island, owing to climate change or other natural hazards such as volcanic eruptions, then the resilience iconizations might be undermined, with vulnerability being iconized at their expense.

With some island languages not having words for ‘vulnerability’ and ‘resilience’, and with some island cultures not having these cultural constructs, sometimes it is important to simply show the island as it is, with the reality of the changes being represented as just that: changes without judgement. These changes might be interpreted externally as ‘catastrophe’ while being accepted internally as one more major set of changes within a millennia-long history of change.

Photo 5 shows Beau Vallon, a bay on Mahé, Seychelles, as the island icon of S3 (sand, sea, sun) tourism. But such island icons should not be taken to represent all of reality. The timeless beauty of Beau Vallon iconized in the photo represents that sunset reality while occluding (i) the reality often interpreted as vulnerability of an eroding beach elsewhere around the bay, pollution in the water and on the sand, dangerous currents, and many tourists with no interest or understanding of local history, culture, and needs; and (ii) the reality often interpreted as resilience of Seychellois having a strong civil society, promoting robust governmental environmental programmes, and seeking improved sustainability processes with the private sector including for tourism.

Insert Photo 5.

Lessons

How does climate change in the context of other potential island catastrophes influence vulnerability and resilience? For myself, co-directing the programme Many Strong Voices (<http://www.manystrongvoices.org> with publications at www.islandvulnerability.org/docs/islandsclimatechange.pdf) has helped to document contemporary patterns of what I interpret to be island vulnerability and island resilience. That leads me and my colleagues to seek generalizable ideas and lessons from the past and present in order to apply to an increasingly networked future under climate change and other potential catastrophes and opportunities.¹⁴

That is especially the case since island vulnerability and island resilience reflect all of our vulnerability and resilience. Islanders might seem like ‘others’ to many, but they represent humanity in terms of how they are dealing now with what all of us seem likely to experience in the future. Here, I try to consolidate such lessons into a trio representing my experiences and backed up by island literature.

Lesson 1 is that a balance is needed between top-down external interventions and locally-driven bottom-up processes. McNamara and Gibson show how UN ambassadors from island countries wish to control their own fates under climate change, while recognizing their need for external help—but external help on the islanders’ terms.¹⁵ Photo 6 shows a sculpture reflecting the United Nations Headquarters where AOSIS (Alliance of Small Island States) and SIDSNet (Small Island Developing States Network) lobby for island-driven interests in a top-down international institution—on the island of Manhattan.

Insert Photo 6.

Lesson 2 is that, combining different knowledge types for reducing vulnerability and improving resilience can help to maintain and develop identity when facing change. Knowledge bases could be scientific, local, or traditional, with overlap occurring among them. There are occasions when different knowledge forms—or the same knowledge form from different sources—clash with or contradict each other, leading to tensions. Power relations can come into play. Local knowledge can be seen as subservient to scientific knowledge. Climate scientists use the argument of authority=superiority, implying or simply accepting that anything in the Intergovernmental Panel on Climate Change must be more credible than any other kind of knowledge.

Mercer et al. demonstrate a technique for combining indigenous and scientific knowledge to assist disaster risk reduction for communities on the SIDS of Papua New Guinea, a technique later implemented on the SIDS of Timor-Leste while enfolding climate change into the scope of disaster risk reduction.¹⁶ Norwegian scientists initiated participatory research processes on the Norwegian island of Smøla in order to place local knowledge within an external management framework for proposing and analysing preferences and expectations for different futures.¹⁷

Lesson 3 is to use problem-driven action research to deal with identified concerns.¹⁸ A practical problem is defined, such as reducing disaster vulnerability or increasing disaster resilience. Research—the scientific knowledge base—is used for dealing with that problem, irrespective of academic discipline or origins of the techniques selected. New knowledge is pursued while (hopefully appropriate) action is catalysed.

Sometimes, though, it might be that the actions which could be implemented by islanders are not enough. Vulnerability often has a significant externally imposed component, namely social and political structures leading to lack of power, choices, control, and resources to address one's own vulnerabilities and resiliences.¹⁹ There is only so much which can be achieved locally.

Insert Photo 7

The Samoan family in Photo 7 told me that their roof was damaged during Cyclone Heta in 2004. The vulnerability is not just a matter of tying the roof to the walls with local materials,²⁰ but is also about the family's own choices regarding how and why they decide to live in that house in that location. Those choices are made or forced upon them within the context of numerous external influences over which they have no control, from inadequate governance to globalisation. They are thus placed within a long-term situation of vulnerability which is exposed by a single cyclone event damaging their roof.

Consolidation

This diverse research on islands and about islanders in the context of catastrophe, which includes but is not limited to climate change, has inspired me to continue to contribute to research, policy, and practice on these topics—and to continue learning from islanders about themselves. For me, the overarching conclusion, which is perhaps a truism, is that island cultures and identities have vulnerabilities and resiliences—which often overlap.

Fishing on the island of Yell, Shetland, Scotland, illustrates a mix of challenges and opportunities. Fishing used to be a significant portion of Shetland livelihoods,²¹ along with farming, but the peril was always that a fishing boat and its crew would never return. The memorial at Gloup on Yell, shown in Photo 8, has a fisherman's wife perpetually gazing out to sea, hoping to glimpse her disappeared husband.

Insert Photo 8.

Today, Shetland fishing boats have GPS, radar, sonar, emergency beacons, and access to professional search and rescue services. While that does not preclude

deaths, it demonstrates change that reduces vulnerability and assists in maintaining the island's fishing identity. In spite of this, fishing has declined as a livelihood on Shetland. The family who owns the boat in Photo 8 also farm, run a bed-and-breakfast, and work on an inter-island ferry. The vulnerability of being a fisher has decreased, certainly, but the vulnerability of the fishing livelihood has increased.

Such change has always been part of island life, with many suggesting that islanders are the stronger for it. Perhaps being unable to deal with change, climatic or otherwise, is the fundamental vulnerability, whereas islanders' ability to change and to adjust to new circumstances is the fundamental resilience.

Changes in island maritime culture are represented in Photo 9 by modern ferries viewed from the Museum Ship *Pommern* in Mariehamn, Åland. Åland's shipping interests have expanded from principally cargo transport and fishing, represented by *Pommern*, to include ferries which promote tourism and duty-free shopping. These latter combine to become the alcohol tourism displayed in Photo 10.

Insert Photo 9.

Insert Photo 10.

As these cultural changes take hold, are they causing more damage to island culture and identity than climate change? Many islands iconized as paradise are likely to be significantly changed (ruined?) by climate change. But current icons of island paradise might have been ruined already by other forces as shown by the reality of Paradise Island, the Bahamas, in Photo 11.

What is the real catastrophe for 'paradise'?

Insert Photo 11.

¹ See K. Hewitt, ed., *Interpretations of Calamity from the Viewpoint of Human Ecology* (London: Allen & Unwin, 1983); J. Lewis, *Development in Disaster-prone Places: Studies of Vulnerability* (London: Intermediate Technology Publications, 1999); B. Wisner, P. Blaikie, T. Cannon, and I. Davis, *At Risk: Natural Hazards, People's Vulnerability and Disasters*, 2nd ed. (London: Routledge, 2004).

² See J.C. Gaillard, 'Resilience of Traditional Societies in Facing Natural Hazards', *Disaster Prevention and Management*, 16.4 (2007), 522–544; J. Lewis and I. Kelman 'Places, People and Perpetuity: Community Capacities in Ecologies of Catastrophe', *ACME*, 9.2 (2010), 191–220; S.B. Manyena, G. O'Brien, and P. O'Keefe, 'Disaster Resilience: A Bounce Back or Bounce Forward Ability?', *Local Environment*, 16.5 (2011), 417–424.

³ See I. Kelman, J. Lewis, J.C. Gaillard, and J. Mercer, 'Participatory Action Research for Dealing with Disasters on Islands', *Island Studies Journal*, 6.1 (2011), 59–86.

⁴ See V. Ballu, M.N. Bouin, P. Siméoni, W.C. Crawford, S. Calmant, J.M. Boré, T. Kanas, and B. Pelletier, ‘Comparing the Role of Absolute Sea-level Rise and Vertical Tectonic Motions in Coastal Flooding, Torres Islands (Vanuatu)’, *Proceedings of the National Academy of Sciences of the United States of America*, 108:32 (2012), 13019-13022, and A.P. Webb and P.S. Kench, ‘The Dynamic Response of Reef Islands to Sea-level Rise: Evidence from Multi-decadal Analysis of Island Change in the Central Pacific’, *Global and Planetary Change*, 72.3 (2010), 234-246 on empirical limitations.

⁵ D. Etkin, ‘Risk Transference and Related Trends: Driving Forces Towards More Mega-Disasters’, *Environmental Hazards*, 1.2 (1999), 69-75.

⁶ M. Fordham, ‘Participatory Planning for Flood Mitigation: Models and Approaches’, *The Australian Journal of Emergency Management*, 13.4 (1999), 27-34; G.A. Tobin, ‘The Levee Love Affair: A Stormy Relationship’, *Water Resources Bulletin*, 31.3 (1995), 359-367.

⁷ A. Szöllösi-Nagy and C. Zevenbergen, eds, *Urban Flood Management* (Leiden: AA Balkema, 2005).

⁸ See I. Kelman, ‘Island Security and Disaster Diplomacy in the Context of Climate Change’, *Les Cahiers de la Sécurité*, 63 (2006), 61-94 on land cessation and relocation; R. Kardol, *Proposed Inhabited Artificial Islands in International Waters: International Law Analysis in Regards to Resource Use, Law of the Sea and Norms of Self-Determination and State Recognition* (unpublished MA thesis, Universiteit van Amsterdam, 1999) on mobile island states.

⁹ M.B. Gerrard and G.E. Wannier, eds, *Threatened Island Nations: Legal Implications of Rising Seas and a Changing Climate* (Cambridge: Cambridge University Press, 2013); Kelman, ‘Island Security’, 61-94; L. Yamamoto and M. Esteban, *Atoll Island States and International Law: Climate Change Displacement and Sovereignty* (Berlin: Springer, 2014).

¹⁰ S. Graci and R. Dodds, *Sustainable Tourism in Island Destinations* (London: Earthscan, 2010).

¹¹ See M. Chapman and P.S. Morrison, ‘Mobility and Identity in the Island Pacific’, *Pacific Viewpoint*, 26.1 (1985), 1-371; E. Hau‘ofa, *A New Oceania: Rediscovering Our Sea of Islands* (Suva: University of the South Pacific, 1993); R. King and J. Connell, eds, *Small Worlds, Global Lives: Islands and Migration Island Studies* (London: Pinter, 1999).

¹² See also P. Rudiak-Gould. *Climate Change and Tradition in a Small Island State: The Rising Tide* (New York: Routledge, 2013).

¹³ See G. Baldacchino, ‘Island Entrepreneurs: Insights from Exceptionally Successful Knowledge-Driven SMEs from 5 European Island Territories’, *Journal of Enterprising Culture*, 13.2 (2005), 145-170; ‘Surfers of the Ocean Waves: Change Management, Intersectoral Migration and the Economic Development of Small Island States’, *Asia Pacific Viewpoint*, 52.3 (2011), 236-246.

¹⁴ See for instance Kelman et. al, ‘Participatory Action Research’, 59-86.

¹⁵ K.E. McNamara and C. Gibson, “‘We do not want to leave our land’”: Pacific Ambassadors at the United Nations Resist the Category of “Climate Refugees””, *Geoforum*, 40.3 (2009), 475-483.

¹⁶ J. Mercer, I. Kelman, K. Lloyd, and S. Suchet, ‘Reflections on Use of Participatory Research for Disaster Risk Reduction’, *Area*, 40.2 (2008), 172-183; J. Mercer, I. Kelman, L. Taranis, and S. Suchet-Pearson, ‘Framework for Integrating Indigenous and Scientific Knowledge for Disaster Risk Reduction’, *Disasters*, 34.1 (2010), 214-239.

¹⁷ J. Thomassen, J. Linnell, A. Follestad, P.A. Aarrestad, G. Jerpåsen, T. Risan, and K. Harvold, *Smølas framtid formes nå. Scenarioutviklingsseminar, Smøla 14. – 15. mai 2008, NINA Rapport 376* (Trondheim: Norwegian Institute for Nature Research, 2008).

¹⁸ Kelman et. al, ‘Participatory Action Research’, 59-86.

¹⁹ See for instance Hewitt, *Interpretations of Calamity*; Lewis, *Development in Disaster-prone Places*; Wisner et al, *At Risk*.

²⁰ As suggested by G. Reardon, ‘Wind Effects on the Tongan “Hurricane House”’, *Disasters and the Small Dwelling: Perspectives for the UN IDNDR*, eds, Y. Aysan and I. Davis (London: James & James, 1992), pp. 175-182.

²¹ See R.F. Byron, 'Skippers and Strategies: Leadership and Innovation in Shetland Fishing Crews', *Human Organization*, 39.3 (1980), 227-232.