

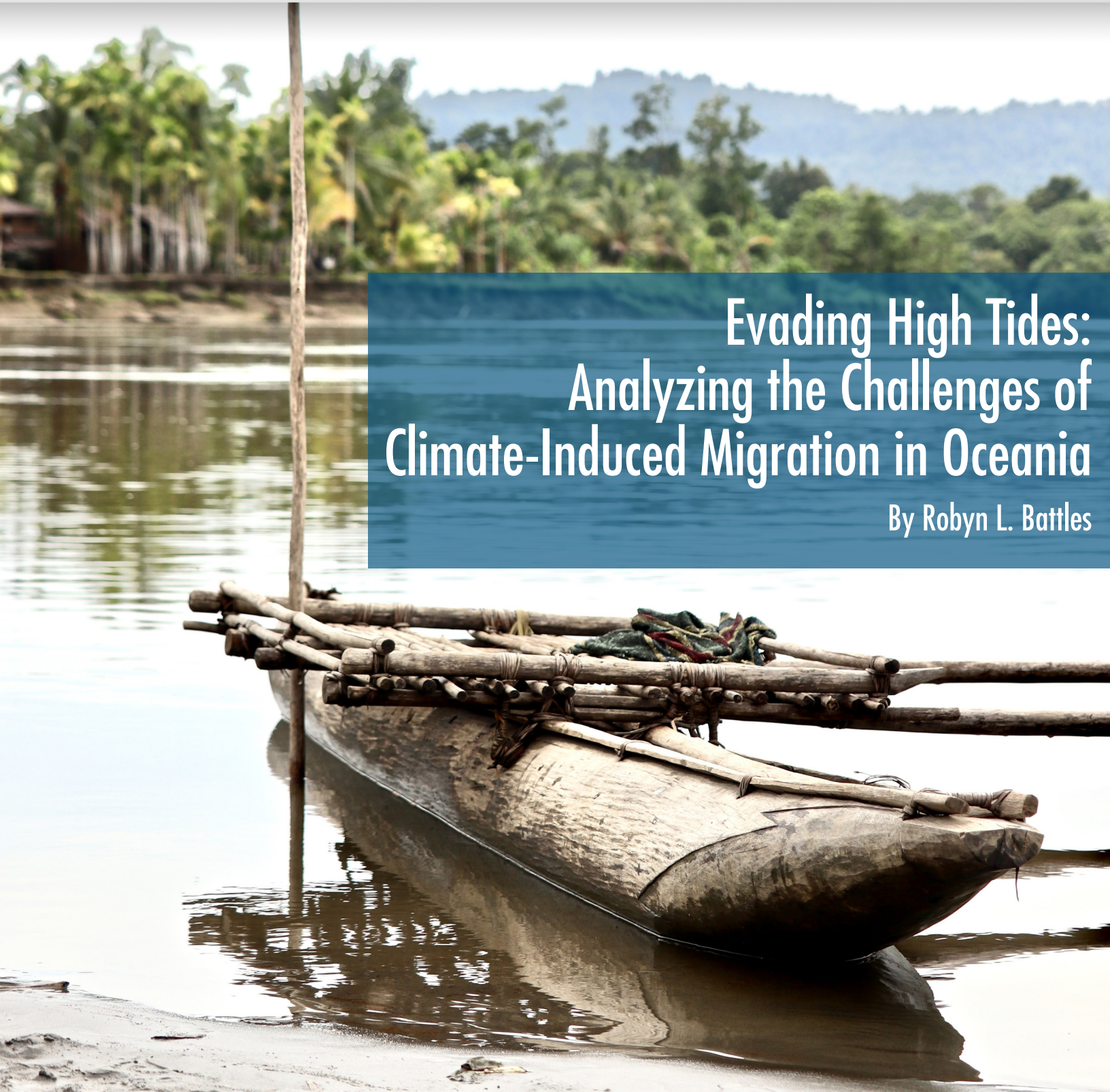


TEXAS A&M UNIVERSITY

The Bush School

of Government & Public Service

CENTER FOR EXCELLENCE IN DISASTER MANAGEMENT & HUMANITARIAN ASSISTANCE
TEXAS A&M UNIVERSITY | THE BUSH SCHOOL OF GOVERNMENT & PUBLIC SERVICE



Evading High Tides: Analyzing the Challenges of Climate-Induced Migration in Oceania

By Robyn L. Battles

[HTTPS://WWW.CFE-DMHA.ORG](https://www.cfe-dmha.org)

[HTTPS://BUSH.TAMU.EDU](https://bush.tamu.edu)

Table of Contents

Executive Summary.....	2
Background and Context.....	2
Defining the Problem.....	3
Migration Trends.....	4
Climate Change-Induced Migration Case Studies.....	7
Case Study 1: Fiji.....	8
Case Study 2: Papua New Guinea.....	9
Case Study 3: Kiribati.....	10
Challenges.....	11
Lessons Learned.....	16
Conditions to Consider.....	17
Areas for Future Research.....	18
Conclusion.....	19
Bibliography.....	21

List of Figures

Figure 1. Map of the Oceanic Region.....	2
Figure 2. Map of Vunidogoloa.....	8
Figure 3. Map of Papua New Guinea.....	9
Figure 4. Map of Kiribati.....	11

List of Tables

Table 1. Population Size and Hypothesized Type of Migration.....	7
--	---

Cover image by Liam Hans, Brown wooded boat on a lake during daytime, Papua New Guinea.
Source: <https://unsplash.com/photos/kzWMfWPo2GM>

ISBN 978-1-955429-27-6

Executive Summary

Using relocation programs from Fiji, Papua New Guinea (PNG), and Kiribati as case studies, this report explains the physical and cultural challenges that arise from forced climate migration. The purpose of this paper is to illuminate the challenges associated with climate-induced migration in Oceania by observing trends and analyzing recent examples. The physical challenges include geographical isolation, limited natural resources, weakened infrastructure, and increased urbanization. The cultural challenges include conflicting customs, population reluctance, and population integration. Lastly, this paper will provide lessons learned and propose areas of future research to better assist the United States Indo-Pacific Command's decision-makers when addressing climate-induced migration in Oceania.

Background and Context

The Oceania region is characterized by its relation to the Pacific Ocean. It includes the three island sub-regions of Melanesia, Micronesia, and Polynesia, plus Australia and New Zealand. There are 14 independent countries and approximately 10,000 islands.¹ Even though the total landmass is a little over 8.5 million square kilometers (sq. km), the combined Exclusive Economic Zone totals 40 million sq. km.² This area is home to around 43.2 million people which makes up about 0.54% of the world's population.³

Consequences of climate change including rising sea levels and depleted natural resources severely threaten the livelihoods of Pacific Islanders, and migration trends are beginning to reflect those challenges. The Indo-Pacific region is home to some of the most frequent and violent natural disasters. Displacement and migration caused by catastrophic events are normal for this area, however, climate change has accelerated and intensified these events. Climate change is rarely the sole push factor leading to migration, but as conditions worsen it is increasingly becoming a larger driver for many Pacific Islanders.

Migrants who are displaced and forced to relocate due to the effects of climate change are generally referred to as “climate refugees,” “climate migrants,” or “environmental migrants.” There is an important distinction between people who voluntarily move because of worsening climate conditions versus those who involuntarily relocate because continued settlement in their homeland is no longer feasible. The former is often referred to as “climate change-related migration” and the latter is often called “climate

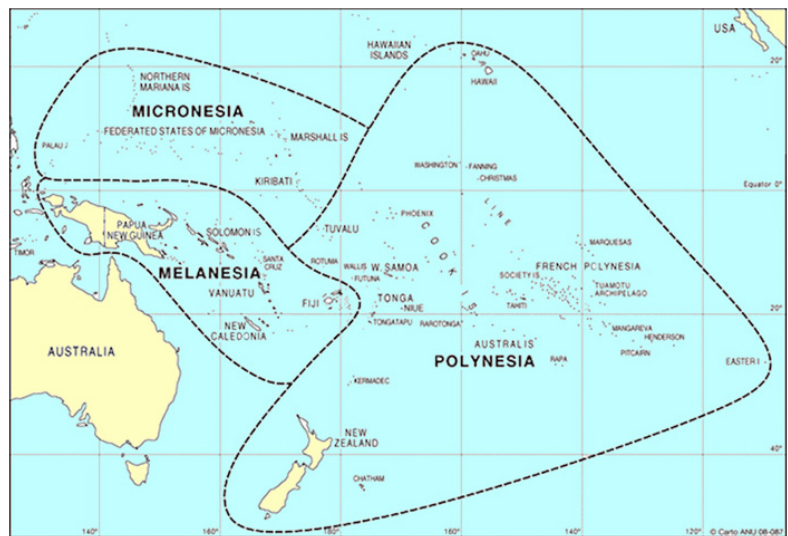


Figure 1. Map of the Oceanic Region.
Data Source: Globalsecurity.org

- 1 Klaus Kaestle, “Countries of Australia and Oceania,” Your Guide to the World: Nations Online Project (Your Guide to the World: Nations Online Project), accessed July 29, 2021, <https://www.nationsonline.org/oneworld/oceania.html>.
- 2 “About Our Region,” International Union for Conservation of Nature (International Union for Conservation of Nature), accessed August 5, 2021, <https://www.iucn.org/regions/oceania/about>.
- 3 “Oceania Population (Live).” Worldometer. Accessed July 27, 2021. <https://www.worldometers.info/world-population/oceania-population/>.

change-induced migration” or “forced climate migration.” For this report, involuntary migration is primarily considered and will be referred to as “climate-induced migration” or “forced climate migration.” Voluntary climate change-related migration takes place under a distinct and separate set of circumstances. Some of the challenges associated with forced climate migration are not factors for climate change-related migration and vice versa. Climate-related migration is an in-depth topic and requires its own independent research and paper. As such, this report will focus largely on climate-induced migration. Occasionally, however, some of the differences between the two types are highlighted throughout.

A slow, long-term trend that progressively worsens over time will likely force people to move from their homes as opposed to a one-time catastrophic event. In the Carteret Islands of PNG, the Huene, Piul, and Han Island coastlines have shrunk over the last few decades causing the population to move further inland.⁴ This happened over time until finally moving further away from the coastline was no longer an option due to failed agriculture and lack of land. This prompted migration to a separate island. Other islands are expected to follow a similar pattern. This means that millions of people will not instantaneously become internally displaced. The more probable scenario is that as sea levels rise, challenges will steadily and continuously increase, and each country will have to repeatedly deal with them on a local level. If the U.S. becomes involved, it is important to know the challenges these countries face and how they are adjusting over time. Migration patterns, challenges, and responses happening now on a smaller scale provide useful insights into these possibilities.

The current overall climate change discussion largely focuses on environmental factors. Until recently, research regarding its impact on migration has been scarce and sporadic. The 2014 report produced by the Pacific Climate Change and Migration (PCCM) Project provided a huge step forward in understanding the unique circumstances in the Pacific. The growing concern for migration issues in the U.S. is evident by President Biden’s Executive Order 14013 “Rebuilding and Enhancing Programs to Resettle Refugees and Planning for the Impact of Climate Change on Migration” released in February 2021. Though there is an upward trend in research concerning climate change’s effects on migration, a greater focus on the Pacific is needed to adequately understand and prepare for potential disasters in the region.

Defining the Problem

The vast majority of islands in the Oceania region are extremely vulnerable to climate change, particularly coastal flooding from rising sea levels and salinization of freshwater sources. Various scientific models have presented sundry results on the rising sea level’s impact on the different types of islands. Most agree that low-lying atolls are most in danger of becoming submerged. Unfortunately, Oceania is comprised of numerous low-lying atolls. Some of the most notable examples include the Marshall Islands, portions of the Kiribati territory, Cook Islands, territories in the French Polynesian region, disputed Chinese territory (Spratly Islands), and the Northwestern Hawaiian Islands.

Some studies suggest that a few Pacific Islands may have a natural means to resist rising sea levels.⁵ Based on the Funafuti Island in Tuvalu, researchers found that coral reef islands (also known as coral

4 Ursula Rakova, Luis Patron, and Citty Williams, “How-to Guide for Environmental Refugees,” Our World (United Nations University, June 16, 2009), <https://ourworld.unu.edu/en/how-to-guide-for-environmental-refugees>

5 Carson McCullough, “Some Islands Prove Resistant to Sea-Level Rise,” Courthouse News Service, June 10, 2020, <https://www.courthousenews.com/some-islands-prove-resistant-to-sea-level-rise/>.

islands) composed largely of gravel or sand have some capacity to adapt to rising sea levels.⁶ As the sea level increases, more sediment is poured onto the land thus raising the elevation of the island.⁷ This does not ensure complete immunity because this natural barrier is only effective if the reef surrounding the island survives. Additionally, scientists found this model to only be true for coral islands, not other rocky islands.⁸

Beyond the geological composition, the Pacific Islands are home to 43 million people.⁹ Researchers state that half the population in the Pacific lives within 10km of the coast and 90% live within 5km (this figure excludes Papua New Guinea).¹⁰ The negative effects of climate change have already been actualized in places like Fiji and the Solomon Islands. The United Nations High Commissioner for Refugees (UNHCR) estimates that around the world approximately 20 million people have become internally displaced or refugees from “Hazards resulting from the increasing intensity and frequency of extreme weather events...”¹¹ One commonly cited study estimates that given the current trends, by 2050, 200 million *more* people worldwide will become displaced by worsening climate conditions.¹² The roughly 43 million people living in Oceania will likely become part of that statistic. Without effective climate change mitigation, the number of displaced individuals will only increase as models have predicted.

The scope of this paper focuses purely on the challenges that climate-induced migration will cause, but it is important to also recognize the other implications of migration. Violence and mental distress often increase following natural disasters and mass migration.¹³ Other ramifications included low fertility rates, sub-replacement rates, and high illiteracy rates. It is also imperative to recognize that climate change is not solely responsible for all estimated displacements. Lack of resources, poor infrastructure, famine, and violent conflicts also play a significant role in those statistics. Climate change as a threat multiplier intensifies the severity of these problems. For example, effects such as rising sea levels can significantly damage agriculture leading to greater food and water insecurity. Intensified natural disasters caused by climate change can also further damage infrastructure. Climate change compounds and exacerbates the problems that states are already facing. Due to the multi-dimensional nature of migration, this report will focus purely on climate migration.

Migration Trends

Oceania is extremely diverse culturally, geographically, and environmentally. These differences will impact migration patterns and factor into overall trends. Some territories have a mixture of islands and low-lying atolls; thus migration will vary depending on each island’s makeup. The University of Texas (UT) report on, “Forced Climate Migration in Oceania” details three types of migration: internal, intra-regional, and extra-regional.¹⁴ These three types will provide the framework to better conceptualize forced climate migration. Internal refers to migration within an island, i.e. moving from a rural coastal

6 Ibid.

7 Ibid.

8 Ibid.

9 “Oceania Population (Live),” Worldometer, accessed July 27, 2021, <https://www.worldometers.info/world-population/oceania-population/>.

10 Neil L. Andrew et al., “Coastal Proximity of Populations in 22 Pacific Island Countries and Territories,” *PLOS ONE* 14, no. 9 (2019), <https://doi.org/10.1371/journal.pone.0223249>.

11 Tim Gaynor, “Climate Change Is the Defining Crisis of Our Time and It Particularly Impacts the Displaced,” UNHCR, November 30, 2020, <https://www.unhcr.org/en-us/news/latest/2020/11/5fbf73384/climate-change-defining-crisis-time-particularly-impacts-displaced.html>.

12 Nicholas Stern. Essay. In *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2011

13 Mohsen Rezaeian. The association between natural disasters and violence: A systematic review of the literature and a call for more epidemiological studies. *J Res Med Sci* 2013;18:1103-7

14 Morgan Henson, Brittany Horton, Andrew Robison, Aaron Wolfson, “Forced Climate Migration in Oceania” Center For Excellence, May 2020

area to an inland urban area. Intra-regional refers to movement from one island to another within the region but outside the original territory. Extra-regional refers to migration from one's home island to an area out of the region. For example, moving to the Global North (Australia, Canada, Europe, Israel, Japan, Russia, Singapore, New Zealand, and the United States) is considered extra-regional.

Assuming that parts of the island of origin are still habitable, some studies suggest that internal migration will be the most common.¹⁵ Countries that previously dealt with forced climate migration have primarily encountered internal migration. The strong cultural and historical ties to their homeland play a large role in this decision. This proclivity is also reflected in some Oceania governments' decisions to focus on adaptation policies as opposed to creating relocation strategies. There are a few exceptions to this trend, most notably Fiji and Kiribati. Both have a policy or program focused on climate-induced relocation. As climate conditions worsen, however, internal migration may become less plausible.

High poverty rates may be another explanation for the higher likelihood of internal migration. The UN reports that "a quarter of Pacific islanders live below basic needs poverty lines."¹⁶ The vastness of Oceania and the lack of resources could physically prevent many individuals from migrating too far from home, despite the necessity to do so. Intra-regional or extra-regional migration may not only be against their preferences, but it may also be unattainable. Internal migration may therefore be their only option. If an island becomes nearly uninhabitable but the population does not possess the means to move, a new problem known as 'trapped populations' arises. A trapped population as explained by the International Organization for Migration is "when people feel the need and the desire to migrate but do not have the possibility to do so."¹⁷ The 2011 Foresight Migration and Global Environmental Change report coined the phrase and became the launching point for further study.

If the population is both willing and able to migrate, intra-regional migration becomes the next best option. Since many Pacific Islanders have close ties to their land of origin it is understandable why they would prefer to move to a place that is culturally and environmentally similar. Thus, islands better equipped to withstand the consequences of rising sea levels will likely take on a greater percentage of migrants. Kiribati has developed treaties with other nearby countries in preparation for this type of migration.¹⁸ Unfortunately, most of these islands are already short on space and have extremely limited resources. This will greatly constrain the number of migrants they can reasonably host.

Extra-regional migration to the U.S., Australia, New Zealand, or any other major state is the most drastic and difficult. However, given the circumstances, it could become the safest and most sustainable option. Larger extra-regional states also can provide better economic and educational opportunities for migrating populations. These states may also have more resources to provide assistance and relief. Many of the neighboring regional islands that could provide a suitable alternative to a migrant's homeland have a very finite amount of space in their urban centers. Their own access to land may be heavily limited due to coastal erosion and insufficient resources. This is especially true if multiple islands experience waves of a mass exodus within the same time frame. Regional host islands may be unable to accommodate high levels of immigration from a variety of other island nations. Larger nations outside the region are environmentally better suited to accommodate larger numbers of migrants.

15 Christiane Fröhlich and Silja Klepp, "Effects of Climate Change on Migration Crises in Oceania," *The Oxford Handbook of Migration Crises*, February 2019, pp. 330-346, <https://doi.org/10.1093/oxfordhb/9780190856908.013.52>.

16 "A Quarter of Pacific Islanders Live below 'Basic Needs Poverty Lines', Top UN Development Forum Hears," News (United Nations, July 10, 2019), <https://www.un.org/development/desa/en/news/sustainable/hlpf-2019-pacific-islands-forum.html>.

17 "Environmental Migration Portal," Trapped populations | Environmental Migration Portal (International Organization for Migration), accessed July 27, 2021, <https://environmentalmigration.iom.int/trapped-populations>.

18 Adelle Thomas and Lisa Benjamin, "Policies and Mechanisms to Address CLIMATE-INDUCED Migration and Displacement in Pacific and Caribbean Small ISLAND Developing States," *International Journal of Climate Change Strategies and Management* 10, no. 1 (August 2018): pp. 86-104, <https://doi.org/10.1108/ijccsm-03-2017-0055>.

The geographic location of extra-regional states is both a pro and a con. It provides a certain level of protection, but also creates new challenges. As mentioned before, most islanders have a strong historical and cultural tie to the homeland and the water. Moving extra-regionally could hurt those ties. Most extra-regional nations have a drastically different culture that Pacific Islanders would need to adjust to. Their ability to fully participate and pass down their cultural practices may be severely limited. Additionally, migrants who move internally can occasionally return to their home island for special occasions. Islanders who migrate extra-regionally may not be able to share this luxury. Most extra-regional migration will likely happen because other regional islands may not have the economic and physical capacity to support large waves of migrants.

Voluntary climate change-related migration trends show more variety. Those who willingly moved were motivated by a variety of factors like economic and educational opportunities in addition to their concerns over worsening climate conditions. It is important to distinguish between those who are forcibly displaced versus those who voluntarily move. For example, non-climate induced migration (voluntary) has created strong Native Hawaiian Pacific Islander (NHPI) communities in many U.S. states. California, Washington, Texas, Florida, Utah, New York, Nevada, Oregon, and Arizona are among the most popular locations for NHPI communities.¹⁹ These established communities will likely attract future forced climate migrants and those states should expect their NHPI populations to increase.

The three different types of migration patterns provide a helpful framework for understanding trends. Based on the geological makeup of each island, researchers can hypothesize where migrants are most likely to originate and what areas they will potentially travel to. Territories that possess low-lying atolls are likely to become the greatest source of migrants. The Micronesian and Polynesian islands are mostly low-lying atolls. As the sea levels rise, causing floods and freshwater salinization, these islands will quickly become uninhabitable. As such, internal migration is highly unlikely. Larger islands like Papua New Guinea, Fiji, and Guam have larger elevations and can withstand higher sea levels, thus migrating out of the country is not immediately necessary. Intra-regional or extra-regional migration from these areas will be due to over-burdened urban centers, strained natural resources, and low economic opportunities in the region. Though extra-regional migration is not currently the most common, this trend will likely change as conditions worsen.

The table below classifies the most prominent Pacific Island Countries (PIC) and hypothesizes which type of migration it is likely to experience. Classification is based on its vulnerability to rising sea levels, its proximity to other low-risk islands, and its proximity to larger landmass countries. The author referenced the UT “Forced Climate Migration in Oceania” Table 2. “Table of population within 1 Kilometer of the Coast.”²⁰ This table classifies PICs into three levels of thresholds. The lower the number, the higher the percentage of the population that lives within 1 kilometer of the coast and are therefore susceptible to rising sea levels. A threshold of one means 100%-79% of the population lives within that 1km mark. Two means 69%-57% and three means only 30%-25%. The referenced report notes that this evaluation under-estimates the percentage of the affected population because it does not include other aspects such as freshwater salinization.²¹

For the table below, the author classified a country as likely to experience extra-regional migration if it met a threshold of 1 and if their surrounding country neighbors are also classified as a 1. If the

19 Lindsay Hixson, Bradford B Hepler, and Myoung Ouk Kim, “The Native Hawaiian and Other Pacific Islander Population: 2010,” 2010 Census Briefs (U.S. Department of Commerce, May 2012), <https://www.census.gov/prod/cen2010/briefs/c2010br-12.pdf>.

20 Morgan Henson, Brittany Horton, Andrew Robison, Aaron Wolfson, “Forced Climate Migration in Oceania” Center For Excellence, May 2020

21 Ibid.

country was classified as a 1 but its neighbors included a mix of 2 or 3 threshold classifications then intra-regional migration is listed as well. Countries with a threshold of 2 are classified as likely to have internal and intra-regional migration. Finally, a country with a 3 threshold is listed as likely to experience internal migration only. Three of the countries: Australia, New Zealand, and PNG are not accounted for in the original threshold reference table. However, given the large landmasses of these areas they likely would meet a level 3 threshold. Additionally, countries with asterisks represent states that could serve as potential hosts for climate-induced migrants.

Population Size and Hypothesized Type of Migration

Country/ Territory	Threshold	Population	Migration Type
American Samoa*	2	55,312	Internal and Intra-regional
Australia*	Not listed	25.4 million	Internal
French Polynesian	1	279,287	Extra-regional
Fiji*	3	889,953	Internal
Guam*	3	167,294	Internal
Kiribati	1	117,606	Intra-regional and Extra-regional
Marshall Islands	1	58,791	Intra-regional and Extra-regional
Nauru	1	12,581	Intra-regional and Extra-regional
New Zealand*	Not Listed	4.9 million	Internal
Niue	3	1,620	Internal
Northern Mariana Islands	2	57,216	Internal and Intra-regional
Palau	1	18,008	Intra-regional and Extra-regional
Papua New Guinea*	Not Listed	8.7 million	Internal
Samoa*	2	197,097	Internal and Intra-regional
Solomon Islands	2	669, 823	Internal and Intra-regional
Tonga	1	104,494	Intra-regional and Extra-regional
Tuvalu	1	11,646	Intra-regional and Extra-regional
Vanuatu	1	299,882	Intra-regional and Extra-regional

Table 1. Population Size and Hypothesized Type of Migration
Population data from World Bank, 2019

Climate Change-Induced Migration Case Studies

This section provides a general overview of current and past climate-induced relocation programs. Fiji, PNG, and Kiribati all demonstrate the different types of migration. The case studies serve to illustrate how migration has occurred and the challenges faced. Studying these events creates useful lessons and helps future decision-makers understand the unique challenges this region presents.

Case Study 1: Fiji

The Republic of Fiji is a conglomerate of over 330 islands in the South Pacific Melanesian region and of those islands only about 106 are inhabited.²² Together these volcanic-formed islands are spread out across around 1.3 million sq. km.²³ Out of the almost 900,000 people living in Fiji, 87% of the population is concentrated on two islands: Viti Levu and Vanua Levu.²⁴

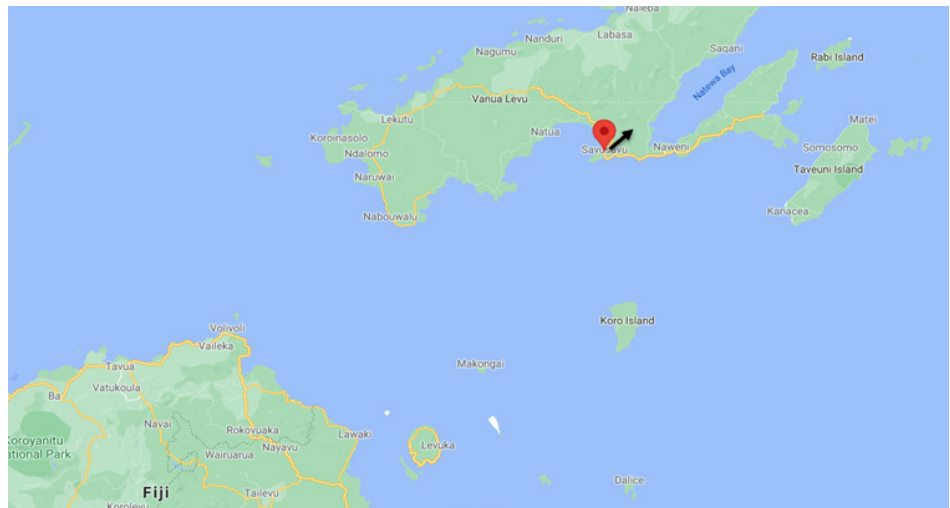


Figure 2. Map of Vunidogoloa
Data Source: Google Maps, 2022

In 2014, Vunidogoloa, a rural coastal village on Fiji's Vanua Levu Island, became one of the best recent examples of climate-induced migration and relocation. The slow onset climate effects forced the 150-person village to relocate.²⁵ Vunidogoloa demonstrates internal migration as the population first tried to move further inland before eventually moving to another island within the Fijian territory. Community members requested government assistance after their continuous efforts to retreat further inland failed to protect them. The Fijian police were primarily responsible for the logistics of relocation and worked in partnership with community leaders.²⁶ The entire process cost the Fiji government approximately FJD \$740,000 (USD \$356,454) and the community subsidized around FJD \$240,000 (USD \$115,607) in timber for construction.²⁷

Island submergence was not the only or even primary cause of relocation in Vunidogoloa. The tidal inundation and coastal erosion significantly damaged the island's infrastructure. This prevented normal movement around the island and endangered livelihoods. Additionally, the saltwater intrusion damaged agriculture. Residents struggled to produce their traditional crops. Crop failure severely endangered their ability to provide food for their community. These conditions prompted the Fijian government to relocate its citizens. This effort provides a great example of how PICs are not only in danger of submergence due to rising sea levels. Other climate change effects can severely damage resources thereby initiating relocation. As this case demonstrated some islands may resist sinking but still become uninhabitable.

Like many other PICs, land in Fiji is customarily owned. This means that property in the country cannot be traditionally bought and sold; instead, it is passed down through families. Only 4% of the land

22 "Facts about Fiji," Embassy of the Republic of Fiji (Embassy of the Republic of Fiji), accessed August 5, 2021, http://www.fijiembassy.be/index.php?page_in=fiji_facts.

23 Ibid.

24 "How Many Islands in Fiji Are Uninhabited?" WorldAtlas (WorldAtlas, August 13, 2019), <https://www.worldatlas.com/articles/how-many-islands-in-fiji-are-uninhabited.html>.

25 Annah Piggott-McKellar et al., "Moving People in a Changing Climate: Lessons from Two Case Studies in Fiji," *Social Sciences* 8, no. 5 (2019): p. 133, <https://doi.org/10.3390/socsci8050133>.

26 Ibid.

27 Dhrishna Charan, Manpreet Kaur, and Priyatma Singh, "Customary Land and Climate Change Induced Relocation: A Case Study of Vunidogoloa Village, Vanua Levu, Fiji," *Climate Change Management*, 2017, pp. 345-358, https://doi.org/10.1007/978-3-319-64599-5_19.

belongs to the government and 6% is free to be bought and sold.²⁸ The remaining 89.75% of the land belongs to the iTaukei communal groups. Developments are allowed on this land, but a lease must be issued by the iTaukei Land Trust Board.²⁹ Fortunately, the Vunidogoloa villagers belonged to the same *mataqali* (a Fijian clan or landowning unit) that had available land.³⁰ Since the migrating population belonged to the same familial group that owned the land, no cultural conflict existed. If, however, the migrating population belonged to a different *mataqali* then they would have had a more difficult time finding suitable land. This cultural consideration will play a large role in future relocation efforts.

Case Study 2: Papua New Guinea

The Independent State of Papua New Guinea lies in the southwest Pacific. It shares a landmass with Indonesia. PNG territory expands across 463,000 sq. km on this second-largest island in the world.³¹ This country is home to a population of about 8.6 million.³² Additionally, there are roughly 700 native languages spoken in the country.³³ Some 80% of the people live in rural areas around the island and urban concentrations of people are rare.³⁴ Similar to Fiji, the island was formed from underwater volcanoes.

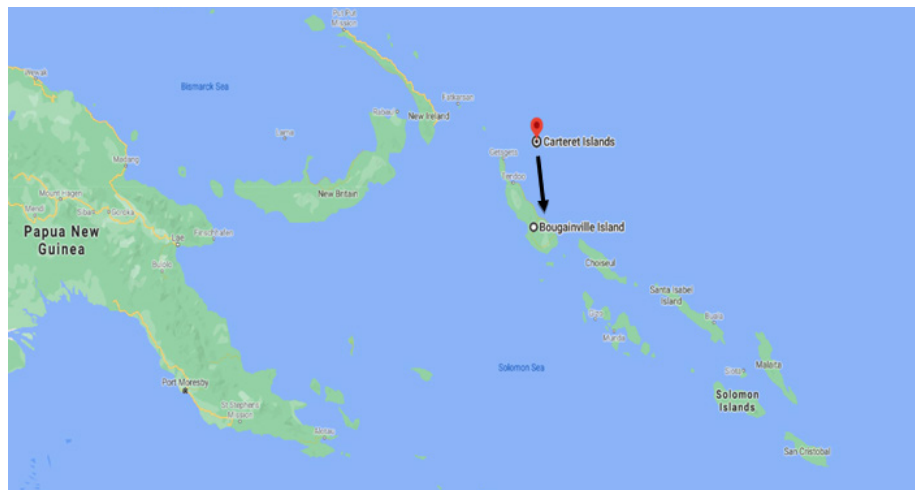


Figure 3. Map of Papua New Guinea
Data Source: Google Maps, 2022

The Carteret Islands (CI), an atoll in the autonomous region of Bougainville, PNG, has also become a classic tale of the horrors of climate change, global warming, and rising sea levels. This small group of islands is largely uninhabitable due to coastal flooding, erosion, saltwater intrusion, and destroyed ecosystems.³⁵ In 2006, the Carteret Council of Elders led an effort to migrate internally to different locations in Bougainville by creating an organization called Tulele Peisa.³⁶ Their new homeland was donated by the Catholic Church. Unlike the Fiji case, the residents were not only in favor of moving but were also the main drivers.

28 iTaukei Land Trust Board, "Land Ownership in Fiji," Land Ownership in Fiji (iTaukei Land Trust Board), accessed August 3, 2021, [https://www.tltb.com.fj/getattachment/Media/Brochures/Land-Ownership-in-Fiji-Booklet-\(1\).pdf.aspx?lang=en-US](https://www.tltb.com.fj/getattachment/Media/Brochures/Land-Ownership-in-Fiji-Booklet-(1).pdf.aspx?lang=en-US).

29 Ibid.

30 Dhrishna Charan, Manpreet Kaur, and Priyatma Singh, "Customary Land and Climate Change Induced Relocation: A Case Study of Vunidogoloa Village, Vanua Levu, Fiji," *Climate Change Management*, 2017, pp. 345-358, https://doi.org/10.1007/978-3-319-64599-5_19.

31 "Papua New Guinea," Key facts (The Commonwealth, March 26, 2021), <https://thecommonwealth.org/our-member-countries/papua-new-guinea>.

32 Ibid.

33 "Papua New Guinea Country Profile," BBC News (BBC, July 10, 2019), <https://www.bbc.com/news/world-asia-pacific-15436981>.

34 Ibid.

35 John Connell, "Last Days in the Carteret ISLANDS? Climate Change, Livelihoods and Migration on Coral Atolls," *Asia Pacific Viewpoint* 57, no. 1 (April 19, 2016): pp. 3-15, <https://doi.org/10.1111/apv.12118>.

36 Ursula Rakova, Luis Patron, and Citty Williams, "How-to Guide for Environmental Refugees," Our World (United Nations University, June 16, 2009), <https://ourworld.unu.edu/en/how-to-guide-for-environmental-refugees>.

Community leaders have long recognized the problems that rising sea levels cause and felt the PNG government did not have a strong enough response. This prompted them to take action and devise a plan to protect their people. Their plan included three components. The first was to create exchange programs between the Carteret and host site populations. The second step included securing land and building housing and infrastructure for the relocated families. The final step, which has yet to be completed, is to create “agricultural and income generation projects.”³⁷ Many of the members including Tulele Peisa leader, Ursula Rakova, view their program as an opportunity to create a blueprint for other climate-induced migrants. The initial concern started in 2006 and the Tulele Peisa received a grant for relocation in 2007.³⁸

Due to the limited space in Bougainville, CI residents are still searching for other places to migrate. This has proven challenging since 97% of the land in PNG is customarily owned.³⁹ As sea levels continue to rise the pressure to find a more sustainable place increases.⁴⁰ This is a challenge that will broadly apply to islands experiencing internal and intra-regional migration.

Case Study 3: Kiribati

The Republic of Kiribati sits centrally in the Pacific Ocean in the Micronesian region. This territory contains 33 coral islands, 21 of which are inhabited.⁴¹ These islands are broken into three categories: the Gilbert Islands, the Phoenix Islands, and the Line Islands.⁴² The focus of this case study is in the Gilbert Islands. The Kiribati islands are largely spread apart bringing the total area to roughly 810 sq. km. The 21 islands together house around 103,000 people.⁴³

Kiribati developed the National Framework for Climate Change Adaptation in 2013. This document lays out the Kiribati government’s plan to respond to climate change through a five-part strategy. Part of their strategy includes intra-regional and extra-regional migration. Population resettlement is one component of their planning document. It aims to “reduce the vulnerability of Kiribati to increasing physical risks caused by climate change by establishing host country agreements to government-sponsored and self-sponsored emigration to resettle I-Kiribati overseas and assist the inevitable migration of the population, due to climate change as and when this eventually arrives.”⁴⁴ The government hopes to begin the process of creating I-Kiribati communities overseas, so that when the “inevitable migration of the whole population” arrives they have resources and assistance.⁴⁵ The Ministry of Health, Ministry of Internal and Social Affairs, Lands, Management Division, Water Management Division, Environment and Conservation Division, National Economic Planning Office, and others are currently overseeing this process.

37 Ibid.

38 Mandy Bridenhagen, “Carteret Islanders: The Story of the First Climate Refugees,” Global Greengrants Fund (Global Greengrants Fund, August 27, 2009), <https://www.greengrants.org/2009/08/27/carteret-islanders-the-story-of-the-first-climate-refugees/>.

39 Sonja Klopff, “Private Lands Conservation in Papua New Guinea,” Colorado Law Scholarly Commons (University of Colorado Law School, September 2004), https://scholar.law.colorado.edu/books_reports_studies/164/.

40 John Connell, “Last Days in the Carteret ISLANDS? Climate Change, Livelihoods and Migration on Coral Atolls,” *Asia Pacific Viewpoint* 57, no. 1 (April 19, 2016): pp. 3-15, <https://doi.org/10.1111/apv.12118>.

41 “About Kiribati,” Kiribati For Travellers (The Kiribati National Tourism Office), accessed August 5, 2021, <https://www.kiribatitourism.gov.ki/kiribati-pacific-ocean-location/>.

42 Ibid.

43 “Kiribati,” The Commonwealth (The Commonwealth, March 26, 2021), <https://thecommonwealth.org/our-member-countries/kiribati>.

44 “National Framework for Climate Change and Climate Change Adaptation.” Office of Te Beretitenti. Accessed July 28, 2021. <https://www.president.gov.ki/presidentgovki/wp-content/uploads/2019/04/National-Framework-for-Climate-Change-Climate-Change-Adaptation.pdf>.

45 Ibid

Kiribati's isolated low-lying atolls with highly concentrated population centers, make it one of the most vulnerable countries in the world.⁴⁶ Its susceptibility is further compounded by the population's low socioeconomic composition. Over the past few years, Kiribati has already experienced waves of internal migration to one of its largest urban centers, South Tarawa. Almost half of the population resides in this area, and it continues to attract more migrants as sea levels steadily rise. Unfortunately, this city faces many strains, poverty being the most prominent. According to the Multidimensional Poverty Index from 2018/2019, in Kiribati, 19.8% percent of the population is classified as multidimensionally poor. This means that roughly 23,000 suffer from multiple disadvantages simultaneously.⁴⁷ The added population places a greater strain on the nation's economy and natural resources.

While South Tarawa has provided a haven in the past, this option is not sustainable economically. Additionally, South Tarawa is a narrow island and most of the infrastructure is along the coast which exposes the population to the negative effects of climate change. Given dramatic increases in sea level, South Tarawa could become completely uninhabitable. Due to poor economic circumstances compounded with the environmental vulnerability, most I-Kiribati will likely need to migrate externally. Fortunately, the Kiribati government understands this reality and has begun establishing relations with neighboring countries. For example, in 2014, the Kiribati government has purchased land from Fiji to house climate-induced migrants.⁴⁸ However, in February of 2021, the Kiribati government began converting this land into a farm to provide food for its citizens in Kiribati.⁴⁹

Challenges

Based on the relocation programs outlined in the previous section, each country encountered various challenges. The issues that arose can be understood in two separate but related categories: physical challenges and cultural challenges. Understanding not only the physical issues that mass migration can cause but also considering the cultural nuances will create a holistic view and better help decision-makers formulate a course of action.

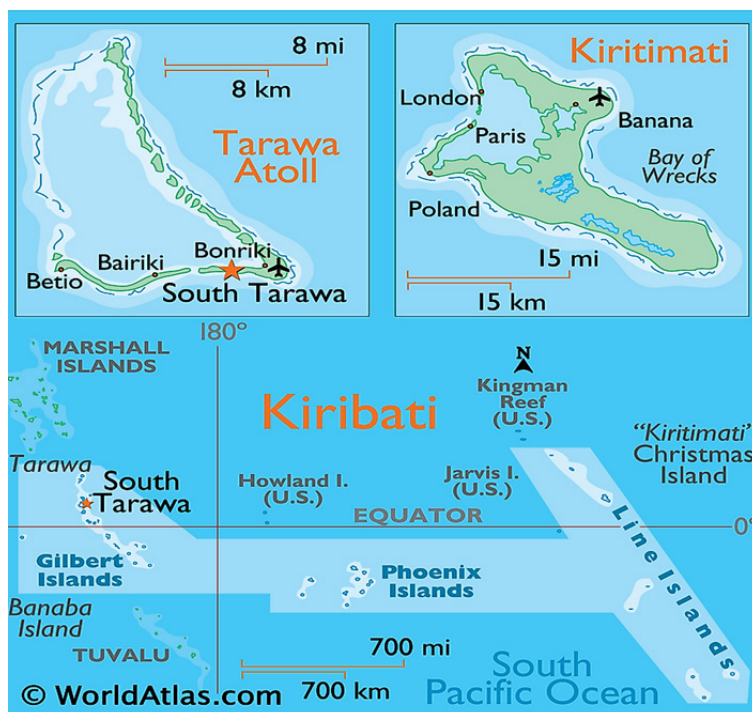


Figure 4. Map of Kiribati
Data Source: WorldAtlas.com

46 John Connell, "Last Days in the Carteret ISLANDS? Climate Change, Livelihoods and Migration on Coral Atolls," *Asia Pacific Viewpoint* 57, no. 1 (April 19, 2016): pp. 3-15, <https://doi.org/10.1111/apv.12118>.

47 Human Development, "The Next Frontier: Human Development and the Anthropocene", 2020, <http://hdr.undp.org/sites/default/files/Country-Profiles/KIR.pdf>

48 Christopher Pala, "Kiribati and China to Develop Former Climate-Refugee Land in Fiji," *Climate Change* (Guardian News and Media, February 23, 2021), <https://www.theguardian.com/world/2021/feb/24/kiribati-and-china-to-develop-former-climate-refugee-land-in-fiji>.

49 Ibid.

Physical Challenges

1. Geographical Isolation

The territories in this region are extremely isolated from larger landmasses and one another. This isolation makes it harder for assisting governments to respond quickly and makes moving extremely dangerous. Millions of people are at risk of becoming displaced, thus providing aid and transporting residents becomes an extremely daunting and slow task. This challenge is further complicated by the sheer vastness of the ocean. There will likely not be a central location to coordinate efforts or gather migrants together in every region. Assisting governments and relief organizations must be aware of how geographically spread out requirements for their assistance may be. Traveling long distances over the ocean will significantly limit the amount and type of supplies that organizations may be able to transport.

Additionally, as more people attempt to migrate the greater the possibility that other issues will arise. Without a proper vessel, traveling across large bodies of water has proven to be extremely dangerous and even deadly. The Rohingya sea migration provides a gruesome cautionary tale. Since 2017, hundreds of refugees fleeing Myanmar have died, thousands have become stranded at sea, and thousands more arrive at refugee camps with serious medical conditions.⁵⁰ Refugees were also subjected to human trafficking, abuse, and exploitation. Mass migration across the world's largest ocean will likely be even more dangerous and deadly. As such, search and rescue capabilities from assisting entities should be prepared to respond to this challenge.

2. Limited Natural Resources

As islands slowly become uninhabitable, population density on habitable lands will increase. Consequently, the natural resources become strained. Land, agriculture, and water are the three most basic resources that are most vulnerable. First, the land is extremely limited on many of these islands. Even the larger islands such as Fiji, PNG, Guam, and New Zealand have limited habitable land due to the mountainous regions, geography, and customary practices. Secondly, to make room for a larger population, agricultural land will likely become compromised. The demand for natural resources will increase in some locations, yet climate change may significantly degrade those resources.

Rising sea levels can cause salinization of fresh water sources that affects both potable water and harms agricultural production even on larger islands that are not at risk of submergence. Decreasing agriculture capabilities also create food insecurities. The fewer agricultural lands available will be further limited by salinization from floodwaters. In many PICs, food must often be imported from other regions. While addressing mass migration, host PICs will likely need even greater food importation. This is a challenge that will be immediately necessary for the short term and needed to sustain the increase in population over the long term.

Other effects of climate change include higher temperatures, droughts, and flooding that threaten the natural resources in PICs. These severely threatened resources are expected to come under even more pressure as the population density in host countries, specifically other PICs increases. Responders and decision-makers should be aware of these challenges. These issues are also likely to drive higher rates of extra-regional migration.

⁵⁰ "Bangladesh: Rohingya REFUGEES Stranded at Sea" (Human Rights Watch, October 28, 2020), <https://www.hrw.org/news/2020/04/25/bangladesh-rohingya-refugees-stranded-sea>.

3. Weakened Infrastructure

Climate change intensifies natural disasters which can destroy infrastructure. Once structures like roads, electrical grids, water supplies, and telecommunications are damaged, it can take years and millions of dollars to reconstruct. Kiribati, the Solomon Islands, and Tuvalu are among the most vulnerable and have been classified as a Least Developed Country (LDC) by the United Nations.⁵¹ These territories tend to have less funding for their infrastructure due to their low economic standing. The infrastructure that does exist is heavily threatened by climate change and natural disasters. The Fiji case study showed how weakened infrastructure can lead to relocation. In addition to causing displacement, damaged infrastructure can stifle migration potentially trapping people in an unsafe environment. Damaged pathways filled with debris and other hazardous material pose a health and physical risk for migrating populations. Extreme flooding contaminates water sources with power lines, waste, harmful chemicals, and wild animals.⁵² Additionally, water can become breeding grounds for water-borne illnesses or attract pests that spread diseases.⁵³ Internal migration becomes more dangerous and intra-regional and extra-regional migration becomes more necessary.

Weakened infrastructure not only becomes a public health concern but also can significantly limit disaster relief efforts. Agencies may be unable to distribute humanitarian aid in certain areas due to the damage caused by the extreme flooding. Responding agencies may not be able to reach the population in need or may not be able to properly distribute humanitarian aid. Relief capabilities will likely become less efficient and more challenging. Rebuilding infrastructure is extremely costly and challenging, yet without it, greater challenges arise.

4. Increased Urbanization

Forced mass migration risks creating increased urbanization both in PICs and in extra-regional host countries. The rural coastal areas are not conducive to hosting large migrant populations. This is primarily because coastal areas significantly expose the population to the harsh effects of climate change. Additionally, the lack of access to social support services in rural areas provides a huge barrier. Since climate-induced migrants are fleeing from one exposed area it is in their best interest to move to another area and urban centers generally provide the best option. Urbanization will increase due to climate-induced migration and climate change-related migration. According to the International Labour Organization, higher urbanization rates leads to other problems such as “[limited] access to land by migrants, a lack of employment and limited opportunities for subsistence livelihoods, and the growth of squatter settlements, which have limited access to infrastructure and are often located on exposed sites, such as low-lying or steep land.”⁵⁴ With land already extremely limited due to the smaller sizes of many islands, heavily concentrating a migrant population in one area can exacerbate problems and strain public services. Increased urbanization also worsens public health problems due to lack of sanitation in crowded areas, and over-burdened water sanitation systems.⁵⁵ Additionally, host countries will need to address social issues like higher unemployment rates. Mass migrations can place a substantial strain on their social services.⁵⁶

51 “List of Least Developed Countries (as of 11 February 2021),” Committee for Development Policy (United Nations, February 11, 2021), <https://www.un.org/development/desa/dpad/least-developed-country-category/lfdc-at-a-glance.html>.

52 “Flood Waters or Standing Waters,” Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, October 15, 2019), <https://www.cdc.gov/healthywater/emergency/extreme-weather/floods-standingwater.html>.

53 Ibid.

54 John Campbell and Olivia Warrick, “International Labour Organizations,” International Labour Organizations (United Nations Economic and Social Commission for Asia and the Pacific, August 2014), <https://www.ilo.org/dyn/migpractice/docs/261/Pacific.pdf>.

55 “Kiribati and Tuvalu Will Drown without Global Climate Action” (The Ecologist, November 17, 2017), <https://theecologist.org/2010/nov/11/kiribati-and-tuvalu-will-drown-without-global-climate-action>.

56 John Campbell and Olivia Warrick, “International Labour Organizations,” International Labour Organizations (United Nations Economic and Social Commission for Asia and the Pacific, August 2014), <https://www.ilo.org/dyn/migpractice/docs/261/Pacific.pdf>.

Despite the numerous challenges mentioned above, increased urbanization may be necessary and helpful. It centrally locates migrant populations in one area instead of dispersing them. In a geographically isolated region like Oceania, urbanization can overcome the aid distribution challenges mentioned above. This is especially important since responding organizations will need an area to coordinate efforts and distribute supplies. Responding entities should be aware that in exchange for ease of access, there is the potential for the difficulties discussed above.

Cultural Challenges

1. Conflicting Customs and Social Structures

The social and cultural challenges are perhaps the most nuanced and will vary depending on which population is migrating away from their home. In many Pacific Islander cultures, the land is symbolic and deeply embedded into their social norms. Oftentimes, it is only passed down through familial lines. For example, the residents on the Carteret Islands live in a matriarchal society in which land is passed down from the mothers to their daughters. Territories with deep historical and ancestral ties often cannot be bought or sold. This presents a major challenge to acquiring land in an already limited space. In some cases, the government is completely unable to acquire new land for potential migrants. Even local clans that wish to assist in relocating other refugees can be prevented from selling land. The Vunidogoloa case of resettlement was a fortunate exception. As a larger number and more diverse populations are forced from their homes, this will become a significant challenge. Land on PICs is finite by nature, they have smaller landmasses and sometimes mountainous regions that make them inhospitable for humans to reside. These cultural differences are not just socially understood, oftentimes the local legislature reflects these norms as well. Relocation may entail reforming local laws in addition to moving entire populations. Host countries may need to acquire legal title to land to provide for increases in their population.

Each ethnic group will also have differing complex social structures. The Carteret Islanders' interaction with the PNG government is the best example. The Islanders are primarily a matriarchal chiefdom with a governing body called the Carterets Council of Elders. Even though the Council of Elders were the main drivers of the relocation programs they needed the PNG government to authorize their plan. PNG has authority over the island territories, but the Council of Elders and Chiefs have local authority granted by the House of Representatives of the Autonomous Bougainville Parliament to represent the islanders. Other PICs have dual authority structures as well. Host countries and responding agencies will need to be sensitive to these differences.

2. Population Reluctance

Pacific Islanders' deep cultural and historical ties to their homeland account for the significant reluctance to relocate. Though the urgency of climate change is felt across the Oceania region, the response varies greatly. The Vunidogoloa case illuminated how reluctance became a challenge. The elderly in particular, tend to be the most resistant to migrating. Many hold firm religious beliefs that their land will be protected. One study observed that the younger generation felt more comfortable leaving their home island compared to the older generation. This general sentiment is reflected in the climate change adaptation plans that PICs have formed. The International Journal of Climate Change Strategies and Management states that only 11 of the Pacific small island developing states (SIDS) referenced either existing or plans for policies that integrate disaster risk reduction with climate change adaptation. Fiji and Kiribati are among the only PICs to include potential resettlement or migration into their adaptation

plans. Despite the worsening climate change effects, decision-makers show a clear proclivity towards mitigation plans as opposed to migration.

In the Vunidogoloa case, the villagers moved from one island within the Fiji territory to another. Many saw this as a huge loss. A similar sentiment can be expected from other populations across Oceania. Migrants moving extra-regionally will likely have an even greater struggle. Migration as a last resort option has the potential to endanger populations as they risk waiting too long to move. The more a population resists, the direr the circumstances they encounter that eventually force them to take refuge elsewhere. This means that the responding agencies will need to prepare to provide emergency responses. As previously mentioned, most climate-induced migration will not happen in one catastrophic event and is likely to create waves of migrants over time. Even with this trend, an extremely reluctant population increases the likelihood of becoming stranded or trapped. In the “migration trend” section of this paper, the potential for trapped populations existed for socioeconomic reasons. This possibility also exists for reluctant populations. Responding agencies should be extremely sensitive and aware of this challenge. Ignoring the perspective of locals losing their land will be detrimental to relations and could lead to creating a more dangerous situation. In addition, reluctant populations will likely struggle more with integrating into their host country.

3. Population Integration

Relocating populations internally, intra-regionally, and extra-regionally is a massive task with a unique set of challenges. Everything from selecting land, to transporting mass amounts of people, to meeting migrants’ basic needs all require a great amount of effort and consideration. The other facet of migration is the population’s integration into their host country’s society. Migrating into a new society, especially extra-regionally, can fracture the migrants’ social structures. The above paragraphs explained how certain cultural norms conflict with migration, but it also hinders a population’s ability to integrate into their new home. Aside from the culture shock that many will encounter, other tangible challenges arise. Many Pacific Islanders are highly skilled in subsistence farming. With some extra-regional societies, this skill may not provide enough income to sustain migrant families. Additionally, the intra-regional territories may have less agricultural land in general for them to work and live. Their skills are suited for life on their home island but may not help them become productive in their new home. Other factors like language barriers or traditional gender roles may hinder their ability to smoothly integrate. These issues by themselves may not seem significant, however, if mass amounts of people are experiencing difficulty, then that creates issues for host governments. Problems like high unemployment rates, poor physical and mental health, and strains on social services could negatively affect a government’s ability to aid migrants. This issue also exists within climate change-related migration as well, but it likely will not become detrimental to the host government when there’s a small population struggling to integrate.

The Kiribati government recognized this challenge and has incorporated a solution into their relocation strategy. They plan to utilize the I-Kiribati communities abroad to help settle future forced climate migrants. The government encourages its residents to continue moving abroad for this reason. The voluntary climate change-related migrants could prove to be beneficial in helping others successfully migrate and cope. Areas with high immigrant populations often adopt resources to better serve their residents. This could include language classes, bi-lingual schools, and job training programs. These existing resources could be modeled and utilized in other places to help integrate future migrants.

Lessons Learned

Each example highlights various challenges from which important lessons can be inferred. These cases possess numerous factors that make them unique, thus all of the lessons garnered cannot be applied to all situations. For example, the Kiribati government's decision to buy land from Fiji is an effective means of protecting their population. Other territories may consider similar strategies, but Fiji cannot be used as an option for every nation. The concepts provided in this section are meant to bring awareness, but it is by no means a comprehensive list of all the steps necessary to ensure a smooth migration. There are many other complex and unforeseeable issues that may arise. However, this report will provide decision-makers with an advantage by outlining the lessons already acquired from previous relocation programs.

One of the biggest physical challenges is the lack of available and suitable land to host migrants. Many will need areas for subsistence farming in addition to housing. As sea levels continue to rise and threaten culturally diverse regions, finding land that aligns with regional practices will become increasingly challenging. Government agencies will need to identify relocation areas well in advance. Waiting until thousands are displaced will exacerbate an already catastrophic event and introduce avoidable complications. Failure to create a plan for potential relocation could endanger many Pacific Islanders' lives. Additionally, negotiations with local ethnic groups may be necessary. This is a lengthy process and is best conducted ahead of drastically changed sea levels.

Vunidogoloa, Kiribati, and the Carteret Islands highlighted the importance of involving the local communities. The migrating population and host government will need to consider the cultural differences and move beyond those challenges. Both parties should be involved in the relocation process from the beginning. Local community leaders understand the needs of their people better than government agencies could. Relocating populations is more than just getting them to safety, it is also about ensuring they can continue to have a quality life afterward. Therefore, cultural considerations and challenges are equally as important as physical ones. Community members can also educate responding agencies on local customs and practices that may hinder efforts. This report mentioned how chiefdoms with dual authority and family-based land ownership can stifle migration and create larger issues. These are just a few potential challenges based on published studies. There are many more nuances within each culture that could present points of contention. The lack of consideration for the local community's opinions and preferences has caused huge issues in past relocation efforts. To address these challenges in the future, government officials must consider the opinion of the population they are affecting. The earlier responding agencies understand and include cultural considerations into their planning, the more efficient the process can become.

Human resource development prior to migration is another important lesson the I-Kiribati government learned. As previously mentioned, the migration process is about more than just moving populations from one location to the next. Creating a space where their basic necessities are met is crucial as well. It does the migrating population and the host countries little good to move a population from one dangerous location to the next. Employment, education, and healthcare are just a few of the areas that will need attention. Many cultures in this region primarily focus on subsistence farming, but in cases like extra-regional migration, these skills may not be adequate to provide for their well-being. In these cases, human resource development programs like job training and language instruction become crucial. Without proper resources, larger problems such as unemployment, homelessness, and illiteracy put people in a vulnerable state. This problem has the potential to snowball, creating larger issues for

the migrating population and the host government. Unfortunately, these programs will create additional costs and burdens on the host countries economy. While it is ideal that these social programs are in place, not every host country will be able to afford them. If this is the case, it is important to note the additional challenges that can arise as a result.

Conditions to Consider

Each of the sections above highlights the lessons learned from existing climate-induced migration literature. These warnings are based purely on what has already happened. As such, it is worth understanding other factors that could influence the situation. The case studies do not address 1) the mass amounts of people migrating to one area, 2) mass migration to other sovereign states, or 3) the realities of life after the move. Several studies explore how migrants adjust to their new homeland, but the case studies themselves do not delve into these issues. This section serves to illuminate other considerations outside of the ones presented in the case study.

First, the political landscape will largely be responsible for shaping the logistics of how migration will take place. Depending on the local politics, some countries may be more or less willing to accept waves of migrants. Places like the U.S., Australia, and Europe continuously have debates over immigration. In March 2021, the Washington Post released a study gauging Americans' perceptions of different types of migrants. They found that "Our respondents saw climate migrants about four percentage points more favorably than economic migrants, those who migrate for better economic opportunities. But they preferred refugees to climate migrants by about three percentage points."⁵⁷ Navigating this tricky scenario will likely come into play as vulnerable PICs begin to find land to host their populations. As their governments begin negotiating with various states, they will need to consider the political environment. As proven in the Rohingya case, if a host country is unwilling to take on migrants it severely endangers them and makes them even more vulnerable.

Second, one of the issues now with current climate-induced migrants is their legal status. The United Nations and governments have a specific definition for refugees and currently, those fleeing their homes due to climate change, do not meet that definition. As such, all of the legal protections that accompany someone possessing a "refugee" status do not apply. There are various efforts across international bodies that are working to address this gap and perhaps as the problem becomes more apparent a resolution will be reached. However, as it currently stands, climate-induced migrants are not classified as refugees and thus do not have protections under international law.

Third, the broader implications of mass migration should be considered. As mentioned earlier in the report, violence and mental distress are common among those who face a natural disaster. Migrants and refugees often face similar trends. Failing to properly address these issues could unnecessarily burden host countries and endanger the migrant populations' well-being. Host countries will need to address interpersonal and community violence. They should also be aware of the sub-replacement rates and high illiteracy that may accompany mass migration

Finally, Islanders' access to social services is a potential problem. Even now in the U.S., despite the immigration benefits that Islanders of Compact of Free Association nations receive, they are still

⁵⁷ Sabrina B. Arias and Christopher W. Blair, "Analysis | the Biden Administration Is Planning for Climate Migration. Do Americans Support Helping Climate Migrants?" (The Washington Post, March 5, 2021), <https://www.washingtonpost.com/politics/2021/03/05/biden-administration-is-planning-climate-migration-do-americans-support-helping-climate-migrants/>.

barred from accessing social services. On one hand, this exacerbates issues such as unemployment, homelessness, and illiteracy which ultimately can burden a host country's economy. On the other, funding these resources of a new subset of the population could also severely weigh on the host country. Most governments would be cognizant of this dilemma and lead to them becoming less willing to accept migrants. Humanitarian organizations will become crucial to balancing these extremes. As a result, responding agencies will need to work closely not only with the local communities, and the local government but also outside humanitarian organizations. Once again, this highlights the importance of being proactive as opposed to reactive when addressing climate-induced mass migration.

Areas for Future Research

Understanding the additional 'conditions to consider' uncovers various gaps in the present research. Studies on climate change-induced migration have exponentially improved over the last decade but researchers should delve deeper into certain topics to foster a more comprehensive understanding of the subject. First, it is important to understand the substantial ethnic, cultural, and linguistic diversity in the Oceania region. Terms such as "Pacific Islanders" are used to group hundreds of different ethnic groups. To truly understand the challenges and fully track migrants, the subcategories of "Pacific Islanders" will need dissection. Diving into the various ethnic groups will influence how policies are shaped and how the populations in this region are handled.

Additionally, the effects of voluntary climate change-related migration deserve more attention. Analyzing voluntary migration could shed light on issues such as integration, host population attitudes toward environmental migrants, and economic impacts. These issues in combination with climate-induced migration have larger implications than what is discussed in this report. In her paper, "Understanding the Human Side of Climate Change Relocation," researcher Sarah Munoz provides insight into the personal and political challenges of climate migration.⁵⁸ This field deserves more attention because the human aspect of migration is equally important as the logistical and political.

Further research on trapped populations is necessary. To properly respond to this potential disaster, studies concerning the implications, challenges, and lessons learned must be conducted. This issue will require planning and preparation to successfully assist in providing relief efforts. As mentioned at the beginning of this report, the 2011 Foresight Migration and Global Environmental Change report made huge strides in bridging the knowledge gaps. Researchers should continue to build on this report to assess the challenges and to create responses ahead of this disaster. Trapped populations and forced climate migration are created from the same environmental problems; thus they are closely linked. However, addressing stranded populations creates a unique challenge and requires individual response plans that differ from climate change-induced migration. Thinking through these challenges is crucial to managing this disaster.

Finally, a deeper dive into the cultural differences, political landscape, and effects on economies are all necessary. Political and economic realities will inevitably influence mass migration caused by climate change. Progressively rising sea levels increase the pressure on potential host states to reexamine their practices. Immigration policies should account for the influx of migrants. States, in partnership with the migrating country's government, may need to locate potential land. Doing so not only mitigates cultural conflicts but also reduces the burden placed on urban centers. The economic effect will be

⁵⁸ Sarah M. Munoz, "Understanding the Human Side of Climate Change Relocation." Resilience. The Conversation, June 11, 2019. <https://www.resilience.org/stories/2019-06-11/understanding-the-human-side-of-climate-change-relocation/#>.

tremendous. Understanding the potential impacts on all parties involved (migrants, origin governments, and host governments) is key to preventing extreme economic conditions. If governments, international organizations, and other responding groups can comprehend the financial implications, then they can better plan and coordinate efforts to address the problem. Waiting to discuss immigration policies, locate land, and address economic concerns until migrants are at their shorelines could prove catastrophic for host countries. This report fervently recommends a proactive approach to addressing this issue to include initiating dialogue.

Conclusion

Migration is not a new or uncommon practice for the Oceania region. Even migrating specifically due to natural disasters or worsening climate conditions is not a new phenomenon. Unfortunately, as sea levels continue to rise causing coastal erosion, intensified natural disasters, and water salinization, more people will be forced to leave their homes. Numerous uninhabited islands in the Pacific have already become completely submerged. On habitable islands, residents have been forced to move further inland or relocate to an entirely different island. The three case studies presented outline three different scenarios providing meaningful lessons learned.

The Fiji case study as an example of internal migration highlighted the challenges of finding suitable land, the complex interactions between differing authoritative bodies, and Islander reservations concerning migration. First, the cultural considerations, as well as the inherent lack of habitable space on many islands, are likely to become a primary issue for migrating populations. The Vunidogoloa case demonstrated ways that migrants were able to locate land that avoided both of these issues. Other islands facing similar circumstances may not have the same fortune, however. In the lessons learned and conditions to consider section, this report emphasized the importance of locating suitable land for migrants ahead of the crisis. Failure to plan will only exacerbate the catastrophe by leaving populations vulnerable thereby unnecessarily burdening host countries. This case also highlights the partnership between the government and local community members. The native population's governing body worked closely with the Fijian authorities. Lastly, the Vunidogoloa case shows the reservations and hesitation Islanders may have towards migration. While it is understandable why populations are reluctant to relocate, this position may create trapped populations or make integration into a new country extremely difficult.

The PNG example demonstrates a community-led approach to internal migration and further illuminates the challenges that can arise between the government and various tribes. The political issues as well as physical challenges have been a primary concern for current migrants and are likely to continue. This case shows how cooperation between semi-autonomous nations and the government at large is a potential point of conflict. Analyzing the PNG climate-induced migration has also highlighted the importance and benefit of using a community-led approach. Climate advocate and PNG native, Ursula Rakova often stresses the importance of involving the local community and listening to their concerns.⁵⁹ This cooperation and cultural consideration are vital to reducing risks. Being keen on cultural differences allows responding bodies to better aid migrants. Local community leaders are the best informed and equipped to address their community's needs. This is especially pertinent when providing humanitarian assistance.

59 Ursula Rakova, *Displacement Solutions* (Displacement Solutions, December 11, 2008), <http://displacementsolutions.org/wp-content/uploads/BG.pdf>.

The Kiribati case of forced migration shows how migration increases the population concentration in urban centers and demonstrates preparation for intra-regional and extra-regional migration. Without proper planning, increased urbanization can make migrating populations extremely vulnerable and weigh heavily on host countries' economies. This case also displays how governments are planning to use voluntary climate-related migration to future forced climate migrants. This is one possible solution to the population integration challenge. The Kiribati government emphasizes the importance of human resource development in host countries. To combat unemployment and decrease their likelihood of becoming a vulnerable population, language development and job training are crucial to their adjustment. This, of course, comes with a financial cost, but origin countries must recognize its importance to their populations.

The four physical challenges- *geographical isolation, limited natural resources, weakened infrastructure, and increased urbanization*- and the three cultural challenges -*conflicting customs and social structures, population reluctance, and population integration*- are illuminated by the case studies provided. Each case revealed significant lessons regarding the planning and implementation stages of mass climate-induced migration. From these lessons, further considerations should also be made. The political landscape, legal status, and access to social services are a few of the other challenges not discussed in the case studies but will likely impact mass migration.

Climate change, rising sea levels, and intensified natural disasters due to climate change will continue to threaten the livelihoods of many Pacific Islanders. Mitigation and adaptation efforts take priority in response to this growing crisis. However, as conditions worsen it is imperative to recognize the dangers that await if mitigation efforts are not successful. In the last few decades, the negative consequences of climate change have materialized and forced people away from their homelands. Incidences like the ones mentioned in the case studies above will continue to increase as conditions worsen. Responding organizations, decision-makers, and government entities should begin the planning process to address forced relocation. Migrants, countries of origin, nor host countries can afford to ignore the potential mass climate-induced migration that severe climate change will cause.

Bibliography

- “About Kiribati.” Kiribati for Travellers. The Kiribati National Tourism Office. Accessed August 5, 2021. <https://www.kiribatitourism.gov.ki/kiribati-pacific-ocean-location/>.
- “About Our Region.” International Union for Conservation of Nature. International Union for Conservation of Nature. Accessed August 5, 2021. <https://www.iucn.org/regions/oceania/about>.
- Andrew, Neil L., Phil Bright, Luis de la Rua, Shwu Jiau Teoh, Mathew Vickers, “Coastal proximity of populations in 22 Pacific Island Countries and Territories,” *PLoS ONE*, 14(9): e0223249. <https://doi.org/10.1371/journal.pone.0223249>
- “Bangladesh: Rohingya REFUGEES Stranded at Sea.” Human Rights Watch, October 28, 2020. <https://www.hrw.org/news/2020/04/25/bangladesh-rohingya-refugees-stranded-sea>.
- Barnett, Jon, and Celia McMichael. “The Effects of Climate Change on the Geography and Timing of Human Mobility.” *Population and Environment* 39, no. 4 (2018): 339–56. <https://doi.org/10.1007/s11111-018-0295-5>.
- Bertana, Amanda. “Relocation as an Adaptation to Sea-Level Rise: Valuable Lessons from the Narikoso Village RELOCATION Project in Fiji.” *Case Studies in the Environment* 3, no. 1 (2019): 1–7. <https://doi.org/10.1525/cse.2018.001701>.
- Boege, Volker, and Ursula Rakova. “Community Input Improves Climate Change-Induced Resettlement Effort.” *New Security Beat*. New Security Beat, January 7, 2020. <https://www.newsecuritybeat.org/2020/01/community-input-improves-climate-change-induced-resettlement-effort/>.
- Boudreau, Diane, Melissa McDaniel, McDaniel, and Andrew Turgeon. “Australia and Oceania: Physical Geography.” National Geographic Society. National Geographic Society, October 9, 2012. <https://www.nationalgeographic.org/encyclopedia/oceania-physical-geography/>.
- Bridenhagen, Mandy. “Carteret Islanders: The Story of the First Climate Refugees.” Global Greengrants Fund. Global Greengrants Fund, August 27, 2009. <https://www.greengrants.org/2009/08/27/carteret-islanders-the-story-of-the-first-climate-refugees/>.
- Campbell, John, and Olivia Warrick. “Climate Change and Migration Issues in the Pacific.” International Labour Organizations. United Nations Economic and Social Commission for Asia and the Pacific, August 2014. <https://www.ilo.org/dyn/migpractice/docs/261/Pacific.pdf>.
- Charan, Dhrishna, Manpreet Kaur, and Priyatma Singh. “Customary Land and Climate Change induced Relocation: A Case Study of Vunidogoloa Village, Vanua Levu, Fiji.” *Climate Change Management*, 2017, 345–58. https://doi.org/10.1007/978-3-319-64599-5_19.
- Connell, John. “6 Nothing There ATOLL? ‘Farewell to the Carteret Islands.’” *Pacific Climate Cultures*, 2018, 73–87. <https://doi.org/10.2478/9783110591415-007>.

- Connell, John. “Last Days in the Carteret ISLANDS? Climate Change, Livelihoods and Migration on Coral Atolls.” *Asia Pacific Viewpoint* 57, no. 1 (April 19, 2016): 3–15. <https://doi.org/10.1111/apv.12118>.
- Corcoran, Joseph, and Anne Virnig, eds. “Tulele Peisa.” *Equator Initiative Case Studies*. Equator Initiative, 2016. https://www.equatorinitiative.org/wp-content/uploads/2017/05/case_1473429470.pdf.
- “‘Deadly Sea Crossings’: 41 Migrants Drown in the Mediterranean.” *Human Rights News | Al Jazeera*. Al Jazeera, February 24, 2021. <https://www.aljazeera.com/news/2021/2/24/un-says-41-europe-bound-migrants-drown-in-mediterranean>.
- “Environmental Migration Portal.” *Trapped populations | Environmental Migration Portal*. International Organization for Migration. Accessed July 27, 2021. <https://environmentalmigration.iom.int/trapped-populations>.
- “Facts about Fiji.” *Embassy of the Republic of Fiji*. Embassy of the Republic of Fiji. Accessed August 5, 2021. http://www.fijiembassy.be/index.php?page_in=fiji_facts.
- “Flood Waters or Standing Waters.” *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, October 15, 2019. <https://www.cdc.gov/healthywater/emergency/extreme-weather/floods-standingwater.html>.
- “Foresight: Migration and Global Environmental Change” (2011) Final Project Report the Government Office for Science, London
- Fröhlich, Christiane, and Silja Klepp. “Effects of Climate Change on Migration Crises in Oceania.” *The Oxford Handbook of Migration Crises*, February 2019, 330–46. <https://doi.org/10.1093/oxfordhb/9780190856908.013.52>.
- Gaynor, Tim. “‘Climate Change Is the Defining Crisis of Our Time and It Particularly Impacts the Displaced.’” *UNHCR*, November 30, 2020. <https://www.unhcr.org/en-us/news/latest/2020/11/5fbf73384/climate-change-defining-crisis-time-particularly-impacts-displaced.html>.
- Henson, Morgan, et. all. “Forced Climate Migration in Oceania.” *LBJ School, the University of Texas at Austin*. 18 May 2020.
- Hezel, Francis X. *Micronesians on the Move: Eastward and Upward Bound*. Honolulu, Hi: East-West Center, 2013.
- Hixson, Lindsay, Bradford B. Hepler, and Myoung Ouk Kim. “The Native Hawaiian and Other Pacific Islander Population: 2010.” *2010 Census Briefs*. U.S. Department of Commerce, May 2012. <https://www.census.gov/prod/cen2010/briefs/c2010br-12.pdf>.
- “How Many Islands in Fiji Are Uninhabited?” *WorldAtlas*. WorldAtlas, August 13, 2019. <https://www.worldatlas.com/articles/how-many-islands-in-fiji-are-uninhabited.html>.
- Human Development, “The Next Frontier: Human Development and the Anthropocene”, 2020, <http://hdr.undp.org/sites/default/files/Country-Profiles/KIR.pdf>

- iTaukei Land Trust Board. Land Ownership in Fiji. iTaukei Land Trust Board. Accessed August 3, 2021. [https://www.tltb.com.fj/getattachment/Media/Brochures/Land-Ownership-in-Fiji-Booklet-\(1\).pdf.aspx?lang=en-US](https://www.tltb.com.fj/getattachment/Media/Brochures/Land-Ownership-in-Fiji-Booklet-(1).pdf.aspx?lang=en-US).
- James, Darren. "Lost at Sea: The Race against Time to Save the Carteret Islands from Climate Change." ABC News. ABC News, August 3, 2018. <https://www.abc.net.au/news/2018-08-04/the-race-against-time-to-save-the-carteret-islanders/10066958?nw=0>.
- Kaestle, Klaus. "Countries of Australia and Oceania." Your Guide to the World: Nations Online Project. Your Guide to the World: Nations Online Project. Accessed July 29, 2021. <https://www.nationsonline.org/oneworld/oceania.html>.
- "Kiribati." The Commonwealth. The Commonwealth, March 26, 2021. <https://thecommonwealth.org/our-member-countries/kiribati>.
- "Kiribati and Tuvalu Will Drown without Global Climate Action." The Ecologist, November 17, 2017. <https://theecologist.org/2010/nov/11/kiribati-and-tuvalu-will-drown-without-global-climate-action>.
- Kiribati poverty and equity brief: spring 2018*. Poverty and equity brief Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/767551528203422506/Kiribati-poverty-and-equity-brief-spring-2018>
- Klopf, Sonja. "Private Lands Conservation in Papua New Guinea." Colorado Law Scholarly Commons. University of Colorado Law School, September 2004. https://scholar.law.colorado.edu/books_reports_studies/164/.
- "List of Least Developed Countries (as of 11 February 2021)." Committee for Development Policy. United Nations, February 11, 2021. <https://www.un.org/development/desa/dpad/least-developed-country-category/lpcs-at-a-glance.html>.
- "Low-Lying Areas of Tropical Pacific Islands." Overview. United States Geological Survey. Accessed July 28, 2021. https://www.usgs.gov/centers/pcomsc/science/low-lying-areas-tropical-pacific-islands?qt-science_center_objects=0#qt-science_center_objects.
- MacInnis, Bo, and Jon Krosnick. "Climate Insights 2020: Natural Disasters." Resources for the Future. Resources for the Future, September 4, 2020. <https://www.rff.org/publications/reports/climateinsights2020-natural-disasters/>.
- Martin, Pierrick C.M., Patrick Nunn, Javier Leon, and Neil Tindale. "Responding to Multiple Climate-Linked Stressors in a Remote Island Context: The Example OF YADUA ISLAND, FIJI." *Climate Risk Management* 21 (May 18, 2018): 7–15. <https://doi.org/10.1016/j.crm.2018.04.003>.
- McCullough, Carson. "Some Islands Prove Resistant to Sea-Level Rise." Courthouse News Service, June 10, 2020. <https://www.courthousenews.com/some-islands-prove-resistant-to-sea-level-rise/>.
- McMichael, Celia, Carol Farbotko, and Karen E. McNamara. "Climate-Migration Responses in the Pacific Region." *The Oxford Handbook of Migration Crises*, 2018, 296–314. <https://doi.org/10.1093/oxfordhb/9780190856908.013.53>.

- McNamara, Karen E., and Helene Jacot Des Combes. "Planning for Community Relocations Due to Climate Change in Fiji." *International Journal of Disaster Risk Science* 6, no. 3 (September 21, 2015): 315–19. <https://doi.org/10.1007/s13753-015-0065-2>.
- McSweeney, Robert. "Low-Lying Atolls Could Become 'Uninhabitable' Earlier than Thought." *Sea Level Rise. Carbon Brief*, April 25, 2018. <https://www.carbonbrief.org/low-lying-atolls-could-become-uninhabitable-earlier-than-thought>.
- Munoz, Sarah M. "Understanding the Human Side of Climate Change Relocation." *Resilience. The Conversation*, June 11, 2019. <https://www.resilience.org/stories/2019-06-11/understanding-the-human-side-of-climate-change-relocation/#>.
- "National Framework for Climate Change and Climate Change Adaptation." Office of Te Beretitenti. Accessed July 28, 2021. <https://www.president.gov.ki/presidentgovki/wp-content/uploads/2019/04/National-Framework-for-Climate-Change-Climate-Change-Adaptation.pdf>.
- "Oceania." *Encyclopædia Britannica*. Encyclopædia Britannica, inc. Accessed August 5, 2021. <https://www.britannica.com/place/Oceania-region-Pacific-Ocean>.
- "Oceania Population (Live)." *Worldometer*. Accessed July 27, 2021. <https://www.worldometers.info/world-population/oceania-population/>.
- Olmos, Sergio. "Micronesia Climate Refugees Increasingly Relocate to Oregon." *Pamplin Media Group*. Pamplin Media Group, July 21, 2020. <https://pamplinmedia.com/pt/9-news/474347-381743-micronesia-climate-refugees-increasingly-relocate-to-oregon&c=8116204908960316089&mkt=en-us>.
- Oppenheimer, M., B.C. Glavovic, J. Hinkel, R. van de Wal, A.K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R.M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meysignac, and Z. Sebesvari, 2019: *Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities*. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*. In press.
- Owuor, Sophy. "What Is a High Island?" *WorldAtlas*. WorldAtlas, May 27, 2019. <https://www.worldatlas.com/articles/what-is-a-high-island.html>.
- "Papua New Guinea." *Key facts*. The Commonwealth, March 26, 2021. <https://thecommonwealth.org/our-member-countries/papua-new-guinea>.
- "Papua New Guinea Country Profile." *BBC News*. BBC, July 10, 2019. <https://www.bbc.com/news/world-asia-pacific-15436981>.
- Peterson, Jesse. "Vunidogoloa: What Can We Learn from Climate Change Relocation?" *Transformative Humanities*. KTH, November 13, 2020. <https://www.kth.se/blogs/hist/2020/01/vunidogoloa-what-can-we-learn-from-climate-change-relocation/>.
- Piggott-McKellar, Annah, Karen McNamara, Patrick Nunn, and Seci Sekinini. "Moving People in a Changing Climate: Lessons from Two Case Studies in Fiji." *Social Sciences* 8, no. 5 (2019): 133. <https://doi.org/10.3390/socsci8050133>.

- “A Quarter of Pacific Islanders Live below ‘Basic Needs Poverty Lines’, Top UN Development Forum Hears.” News. United Nations, July 10, 2019. <https://www.un.org/development/desa/en/news/sustainable/hlpf-2019-pacific-islands-forum.html>.
- Rakova, Ursula. The Bougainville Resettlement Initiative Meeting Report. Other. *Displacement Solutions*. Displacement Solutions, December 11, 2008. <http://displacementsolutions.org/wp-content/uploads/BG.pdf>.
- Rakova, Ursula, Luis Patron, and Citty Williams. “How-to Guide for Environmental Refugees.” Our World. United Nations University, June 16, 2009. <https://ourworld.unu.edu/en/how-to-guide-for-environmental-refugees>.
- Rezaeian, Mohsen. The association between natural disasters and violence: A systematic review of the literature and a call for more epidemiological studies. *J Res Med Sci* 2013; 18:1103-7
- “Sea-Level Rise and Tsunami Vulnerability of Habitat and Wildlife of the Northwestern Hawaiian Islands.” Overview. United States Geological Survey. Accessed July 28, 2021. https://www.usgs.gov/centers/pierc/science/predicting-risks-island-extinctions-due-sea-level-rise-model-based-tools?qt-science_center_objects=0#qt-science_center_objects.
- Stern, Nicholas. Essay. In *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2011.
- Storlazzi, Curt D., Stephen B. Gingerich, Ap van Dongeren, Olivia M. Cheriton, Peter W. Swarzenski, Ellen Quataert, Clifford I. Voss, et al. “Most Atolls Will Be Uninhabitable by the Mid-21st Century Because of Sea-Level RISE Exacerbating WAVE-DRIVEN FLOODING.” *Science Advances* 4, no. 4 (April 25, 2018). <https://doi.org/10.1126/sciadv.aap9741>.
- Thomas, A. and Benjamin, L. (2018), “Policies and mechanisms to address climate-induced migration and displacement in Pacific and Caribbean small island developing states”, *International Journal of Climate Change Strategies and Management*, Vol. 10 No. 1, pp. 86-104. <https://doi.org/10.1108/IJCCSM-03-2017-0055>



Prepared By:
Center for Excellence in Disaster Management & Humanitarian Assistance
456 Hornet Avenue, Joint Base Pearl Harbor - Hickam, Hawaii 96860-3503
Telephone: (808) 472-0518
<https://www.cfe-dmha.org>

ISBN 978-1-955429-27-6