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Vulnerability and Climate Change Induced Human Displacement

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Abstract

This paper addresses the relationship between vulnerability and climate change induced human population displacement. Anthropogenic climate change is increasingly altering the way people live. A significant consequence of the effects of climate change is human displacement due to climate effects such as hurricanes, sea level rise, and drought. People displaced by the effects of climate change suffer from a legal protection gap. Increasing global attention is being addressed at closing this gap. This paper explores the relationship between vulnerability and climate change induced displacement by analyzing case studies of hurricane induced displacement in the U.S. Gulf Coast, cyclone induced displacement in Bangladesh, and drought induced displacement in Somalia. Analysis of these case studies demonstrates that there is a relationship between socioeconomically vulnerable populations and displaced populations. Both in developed and developing countries, environmental displacement affects vulnerable populations disproportionately. Policy aimed at closing the legal protection gap for environmentally displaced persons should address the socioeconomic inequalities that make marginalized groups more vulnerable to climate change.

Keywords: climate change, displacement, vulnerability, climate risk, refugee, climate law

Author's Note:
I pursued this research as an opportunity to combine my studies in Law, Societies, Justice, and Environmental Studies in a culminating senior thesis. I first explored the topic of environmental displacement in a course on U.S. Asylum and Refugee law. After gaining an introduction into how migration and refugee law applies, or more accurately does not apply, to environmentally displaced persons, I decided to further research the problem and complete a senior thesis.

Introduction

Anthropogenic climate change is adversely affecting the Earth's environment and altering the ways in which people live. Politicians and decision makers are addressing greater attention towards people displaced by the effects of climate change or who will be displaced in the future. This problem is a powerful example the human face of climate change in the international policy arena.[1] The UN High Commissioner for Refugees (UNHCR) has acknowledged that the effects of climate change have forced people to leave their homes in search of new lives in new places, and states that the UNHCR will work on human rights issues relating to climate change induced population displacement and adapt much of its environment-related planning and work to address the effects of climate change.[2] The UNHCR has expressed concern, however, because environmentally displaced persons (EDPs), are not covered by the 1951 Refugee Convention and are therefore not protected by the UNHCR's charter. The media and politicians often refer to EDPs as 'climate refugees,' however there is not a consensus among politicians, international institutions, or academics that EDPs necessarily refugees due to their legal ambiguity. This lack of consensus has created a legal protection gap.

Environmental displacement is not solely an ecological problem. It is a multicausal problem where ecological and socioeconomic vulnerability act together to displace marginalized people. Professor of Geography Steve Lonergan noted in 1998:

there is too often an uncritical acceptance of a direct causal link between environmental degradation and population displacement. Implicit in these writings is the belief that environmental degradation – as a possible cause of population displacement- can be separated from other social, economic or political causes. It must be recognized that the degradation of the environment is socially and spatially constructed; only through a structural understanding of the environment in the broader political and cultural context of a region or country can one begin to understand the 'role' it plays as a factor in population movement.[3]

The problem with relying on a refugee framework for addressing EDPs is that this method risks accepting an uncritical link between climate change and population displacement.

Climate change alone does not displace people, it exacerbates social vulnerability which contributes to displacement. While addressing environmental displacement as a refugee crisis creates a

[1] Koko Warner, "Climate Change Induced Displacement: Adaptation Policy in the Context of the UNFCCC Climate
[2] "Climate Change," *UNHCR*, accessed March 8, 2015,http://www.unhcr.org/pages/49e4a5096.html
[3] Steve Lonergan, "The role of environmental degradation in population displacement," *Environmental Change and Security Project Report* 4 (1998): 8.

sense of urgency, this framework will not adequately address the problem. Climate change is not the sole source of persecution that leads people to environmental displacement. In fact it is not a source of persecution at all because it does not discriminate. The impacts of climate change may be the reason for why people evacuate, but they alone do not explain why people do not return to their places of origin. The problem results from the complex relationship between climate change, lack of agency, and governance. In this paper I argue that socioeconomic inequality and marginalization of vulnerable communities account for the disparity in who is displaced by the effects of climate change. I will first provide a review of current scholarship on the issue, and then examine case studies of environmental displacement in the U.S. Gulf Coast, Bangladesh, and Somalia. Finally I will discuss the policy implications of my findings and argue that policies aimed at addressing the legal protection gap that exists for environmentally displaced people needs to address the underlying socioeconomic conditions of marginalization that create displacement by taking a human rights based approach.

Categories of Climate Change Induced Displacement

Environmental migration is either slow onset or rapid onset. In this paper I will look at slow onset environmental displacement and rapid onset environmental displacement from hydro-meteorological disasters, disasters caused by water related events. Climate change contributes to both rapid-onset and slow-onset environmental displacement. Climate effects like increasing ocean temperatures, rising sea levels, and increasing global temperatures, alter the way people interact with water. Climate change threatens aspects of life such as living near bodies of water and relying on bodies of water and groundwater for livelihoods. The threats to the way people interact with water influence rapid onset and slow onset migration.

Rapid onset environmental displacement is people displaced due to natural disasters such as hurricanes, cyclones, and landslides, which render places uninhabitable. It is associated with climate change because of the effect of rising ocean temperatures on ocean movements and storms. According to the Internal Displacement Monitoring Centre, "14.9 million people were displaced by sudden-onset natural disasters in 2011" alone.[4] In this paper, I will examine rapid-onset environmental displacement resulting from Hurricane Katrina in the U.S. Gulf Coast and Cyclone Aila in Bangladesh.

Slow onset displacement involves peoples gradually forced out of their place of inhabitance due to factors such as drought, soil

[4] Vikram Kolmannskog, "Climate Change, Environmental Displacement and International Law," *Journal of International Development* 24 (2012): 1071.

erosion, and sea level rise, which make their way of life in that place impossible. Droughts are expected to become more frequent and severe due to anthropogenic climate change.[5] In particular, climate change is expected to decrease freshwater availability and affect between 75 and 250 million people in Africa by 2020.[6] Slow-onset displacement due to drought is often temporary, such as is common in Somalia. Slow-onset displacement in Somalia, which I will discuss later in this paper, is an extreme example of drought related migration. Migration related to drought is often multicausal; due to the impacts of drought combined with resulting political or economic crises. Slow-onset ecological events like droughts gradually deteriorate people's livelihoods to the point where they cannot sustain an adequate standard of living in their places of origin. Droughts alone do not necessarily render areas inhabitable or dangerous to continue residing in, but they affect many aspects of life including economies. For this reason there is greater inclination to categorize slow-onset EDPs as economic migrants than there is for rapid onset EDPs. In this case of Somalia, and in other cases of drought related displacement, environmental displacement can be thought of as migration motivated by a tipping point.[7]

Review of Literature

Terminology

The term 'climate refugee' is frequently used in politics and media, yet it is met with a degree of caution in scholarship because people displaced due to climate change are not covered by the 1951 Convention Relating to the Status of Refugees. According to the convention, a refugee is someone who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country."[8] EDPs do not have the rights that the Convention and the UNHCR, the U.N. agency mandated to safeguard the rights of refugees as guaranteed by the 1951 Convention, awards to Convention refugees. Political scientists and environmental policy scholars Biermann and Boas use the term 'climate refugee' because it has strong moral connotations and gives the problem legitimacy and urgency.[9] This understanding departs from the legal definition of a

[5] Robert A. McLeman, *Climate and Human Migration: Past Experiences, Future Challenges* (New York: Cambridge University Press, 2014), 141.
[6] Cecilia Tacoli, "Crisis or Adaptation? Migration and Climate Change in a Context of High Mobility," in *Population Dynamics and Climate Change,* ed. Jose Miguel Guzman et al. (New York: United Nations Population Fund, 2009), 108.
[7] Jane McAdam, "The concept of crisis migration," *Forced Migration Review* 45 (2014): 10.
[8] Frank Biermann and Ingrid Boas, "Preparing for a Warmer World" Towards Global Governance System to Protect Climate Refugees," *Global Environmental Politics* 10 (2010): 67.
[9] Ibid.

refugee. McAdam, a professor of refugee law, refers to the term 'refugee' as "a legal term of art" confined to the definition by international law, and does not consider EDPs as refugees.[10] Many scholars reject the term 'environmental refugees' because it assumes there is a direct causal link between environmental change and migration. The term creates an oversimplified view of the problem, which is based on 'common sense' rather than a complex understanding.[11] Subramanian and Urpelainen use the term environmentally displaced persons "so as to not confuse their rights with conventional refugees."[12] Kolmannskogg also uses this term, defining it as "those forcibly displaced at least partly because of a natural disaster."[13] EDP is also the UNHCR's preferred term and I will be using it in this paper.[14] Though imperfect, the term 'EDP' allows for considerations of climate change, human agency, and governance, when analyzing the multicausal nature of environmental displacement.

Relevance and role of international law

People fleeing regions for environmental reasons do not meet the strict definition of refugee from the 1951 Convention. The commonly used term 'climate refugee' is therefore flawed. However as McAdam notes, while the law defines 'refugee' in a particular way, this does not mean that displaced people who do not fit the definition are unworthy of refugee protection or even necessarily denied it.[15] The 1951 Convention Relating to the Status of Refugees was a stop-gap measure implemented to address the refugees of WWII. The U.N. intended for it to be temporary and solve a temporary problem. However, the 1951 Convention and the following 1967 Protocol are used today to cover the world's vast number of refugees fleeing persecution. The 1951 Convention alone cannot address the plight of EDPs first because it was written to address a specific problem, and second because climate change was not understood when the 1951 Convention and 1967 Protocol were written. The principle of protection and *non-refoulment* – not forcing refugees to return to their countries of origin – should apply to EDPs on moral grounds. The reasons for their displacement are different than those of Convention refugees, but their suffering is similar.

[10] McAdam, *Climate Change, Forced Migration, and International Law*, 97

[11] Tacoli, "Crisis or Adaptation? Migration and Climate Change in a Context of High Mobility," 107.

[12] Narayan Subramanian and Johannes Urpelainen, "Addressing cross-border environmental displacement: when can international treaties help?," *International Environmental Agreements: Politics, Law and Economics* 14 (2013): 27.

[13] Kolmannskog, "Climate Change, Environmental Displacement and International Law," 1072.

[14] UNHCR, "Environment and Climate Change." UNHCR The U.N. Refugee Agency. Accessed January 29, 2016. http://www.unhcr.org/pages/49c3646c10a.html.

[15] McAdam, *Climate Change, Forced Migration, and International Law*, 97.

Expanding the 1951 Refugee Convention

The case could be made for the Refugee Convention to be reinterpreted to include EDPs. A refugee is persecuted based on "reasons of race, religion, nationality, or membership of a particular social group or political opinion." Accordingly, EDPs experience climate disasters differently based on their demographics and memberships in certain social groups. Politicians in ecologically vulnerable countries like the Maldives and Bangladesh have even called for the Convention to be amended to include protections for EDPs.[16] While EDPs do not meet the strict definition of a refugee, it is too soon to say that EDPs will never be covered by the refugee definition.[17] The reason for this is that displacement is not random. Marginalized populations that become environmentally displaced arguably constitute a 'particular social group.' Marginalized groups such as ethnic minorities and members of oppressed castes are both more exposed to climate disaster before they occur and suffer from inequitable distribution of relief and assistance after the disaster. This distinction between the general population and marginalized groups' experience of climate change, which I discuss through three case studies in this paper, could fulfill the requirement of "reasons of race, religion, nationality, or membership of a particular social group or political opinion."

Lack of protection assistance in the aftermath of disasters is comparable to persecution if the assistance is unequally or inequitably distributed. In cases of politicized disaster relief, as was the case in the aftermath of Hurricane Katrina, particular social groups may be unable to avail themselves of state protection in the form of disaster relief. Sources of persecution need not be a state actor, or even supported by state actors, to be considered persecution under the Convention. Deborah Anker, Professor of Law and Director of the Harvard Law School Immigration and Refugee Clinical Program, argues that persecution includes situations where the state is "simply unable to protect its citizens."[18] She further argues that "refugee law exists to provide surrogate… protection when the state has failed in fundamental duties it owes to its population and this failure has a discriminatory impact based on" Convention categories.[19] Anker's surrogacy principle is useful in analyzing the role of international refugee law for EDPs. Discriminatory climate adaptation policies and failure to provide adequate disaster relief can be considered as persecutory because the state is failing in its fundamental duties it owes to its population, the protection of people's lives.

[16] Jane McAdam, "Swimming against the tide: why a climate change displacement treaty is not the answer," *International Journal of Refugee Law* 23 (2011): 6.
[17] Kolmannskog, "Climate Change, Environmental Displacement and International Law," 1075-1076.
[18] Deborah Anker, "Refugee Status and Violence Against Women in the 'Domestic' Sphere: the Non-State Actor Question." *Georgetown Immigration Law Journal* 15 (2001): 394.
[19] Ibid, 399.

As discussed earlier, not all scholars reject using the term 'climate refugee.' Biermann and Boas support using the term, but they do not support expanding the 1951 Convention to cover said climate refugees. They argue that the UNHCR rejects the term 'climate refugee' because of the legal rights that it bestows upon 'refugees.' Transboundary flight distinguishes refugees from internally displaced persons (IDPs). By law, refugees must be outside of their country of nationality. If their flight is internal, they are considered IDPs. Biermann and Boas disregard the transboundary flight requirement for refugees because climate change will cause transnational and internal flight. They choose to use the term refugee because it has "strong moral connotations of social protection... [and] by using this term, the protection of climate refugees will receive the legitimacy and urgency it deserves."[20] They define climate refugees as "people who have to leave their habitats, immediately or in the near future, because of sudden or gradual alterations in their natural environment related to at least one of three impacts of climate change: sea level rise, extreme weather events, and drought and water scarcity."[21] One argument against expanding the Convention's mandate to cover people under Biermann and Boas' definition is that it would extend Convention protections to a group 20 times larger than what is currently covered. This could produce a trade-off between the legal protection of climate refugees and the protective services currently awarded to Convention refugees. Another argument is that climate refugees require a different kind of protection than Convention refugees because most will remain in their home countries. [22] Rather than expanding the Convention, Biermann and Boas propose establishing a new regime for governing climate refugees, with an emphasis on resettlement, collective rights, and international assistance and burden sharing.[23] They suggest this regime could take the form of a protocol to the United Nations Framework Convention on Climate Change.[2425] The UN Development Programme and the World Bank could serve as implementing agencies.[26] Biermann and Boas acknowledge that the proposed governance system would have to overcome practical and political hurdles. An obvious hurdle is the emphasis on international assistance and burden sharing based on grant funding, which creates

[20] Biermann and Boas, "Preparing for a Warmer World" Towards Global Governance System to Protect Climate Refugees," 66-67.
[21] Ibid.
[22] Ibid, 74.
[23] Ibid, 79.
[24] Ibid, 75-76.
[25] United Nations Framework Convention on Climate Change, *Paris Agreement,(* FCCC/CP/2015/10/Add.1) 2015. http://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf
[26] Biermann and Boas, "Preparing for a Warmer World" Towards Global Governance System to Protect Climate Refugees," 79.

a financial burden for donor countries. However, they argue that attitudes of self-interest may, or may have to, change.[27]

In some cases, new contextual interpretations of the Refugee Convention could be useful in addressing the problem of environmentally displaced persons. However, as supported by both McAdam and Biermann and Boas, the Convention alone cannot address the problem because it was not designed to address this issue. The majority of environmental displacement cases do not meet its criteria. Limiting the understanding of EDPs as 'refugees' lessens the severity of the problem by limiting it to a framework with which it is not wholly compatible.

Internal displacement protocols

Another reason that the Refugee Convention is not the most appropriate legal mechanism for addressing EDPs is that they are predominantly internally displaced, meaning they are displaced within their countries of origin. Kolmannskogg suggests that the 1998 Guiding Principles on Internal Displacement, which incorporate aspects of international refugee law, provide a useful framework for addressing environmental displacement. The Guiding Principles contain a broad definition of internally displaced persons (IDPs), "which includes those fleeing man-made or natural disasters." The UN Special Rapporteur on the Human Rights of Internally Displaced Persons has further clarified that the definition covers EDPs. The Guiding Principles are a soft law mechanism that are increasingly being incorporated into national laws and policies. Soft law is legal agreements and understandings that are non-binding. Its biggest advantage is its flexibility.[28] Soft law is often associated with international law, as most U.S. Resolutions and Declarations fall under it. States are not bound by soft law provisions, but there is a legal expectation that they abide by them and use them to guide domestic policy. Soft law is especially relevant when discussing the impacts of climate change, as it is still a developing field of science and policy, and non-binding law may be temporarily more appropriate. However, because they are non-binding, there is also very limited enforceability and accountability with soft law mechanisms.

Regional regimes

Subramanian and Urpelainen use a game theory analysis to study when regional collaboration in the form of environmental displacement treaties is feasible to address cross-border displacement caused by environmental degradation.[29] Game theory analyses allow

[27] Ibid, 83.
[28] Kolmannskog, "Climate Change, Environmental Displacement and International Law," 1072-1073.
[29] Subramanian and Urpelainen, "Addressing cross-border environmental displacement: when can international treaties help?," 25.

us to see under what quantifiable conditions two states will cooperate. The study finds that treaty formation is easier under conditions of mutual vulnerability.[30] Countries are more likely to agree to a cross-border displacement treaty with each other when each is somewhat equally vulnerable. This is because they have similar assets and securities to lose or gain from a treaty.

Subramanian and Urpelainen analyze different variables to determine if two countries will agree on treaty participation. Participation involves a commitment to assisting EDPs from other countries. The analysis shows that countries join displacement treaties only if they expect the benefits of assistance from participatory states to outweigh the costs of offering assistance to other states. For this reason, treaty formation is easier when countries are similarly situated in terms of vulnerability to climate change. Subramanian and Urpelainen support regional treaties because mutual vulnerability is more likely in geographic regions.[31] Global treaties are unlikely to get support from low vulnerability countries that would have to take on a greater financial burden.

Though environmental displacement is primarily internal, cross-border displacement can be expected in low-lying island nations and in border areas.[32] Cross-border environmental displacement is already happening in countries like Somalia, where slow-onset environmental disasters are gradually driving people out of the country. Researching theories on cross-border environmental displacement is important for governments to consider when cooperation can be in a state's interests.

Subramanian and Urpelainen cite the Kampala Convention as an example treaty that supports their model. The Kampala Convention is a treaty adopted by the African Union that covers a wide range of cases for displacement including those "due to natural or human made disasters, including climate change."[33] The treaty includes measures to prevent internal displacement and mitigate its root causes. It also calls for assistance by humanitarian agencies and other relevant actors when a state is unable to provide sufficient protection. Subramanian and Urpelainen interpret 'other relevant actors' to include other state parties.[34] The Kampala Convention supports their model as all 24 countries that have ratified the Convention are above median vulnerability when country vulnerability is quantified.[35] A regional treaty can therefore serve as collective insurance against the threat of environmental

[30] Subramanian and Urpelainen, "Addressing cross-border environmental displacement: when can international treaties help?," 25.
[31] Ibid, 26-27.
[32] Ibid, 26.
[33] Ibid, 37.
[34] Ibid.
[35] Ibid, 38.

displacement.[36] While their model of mutual vulnerability can be useful in addressing EDP treaties at a regional level, it does not account for the fact that there is significant asymmetry in climate vulnerability among countries of the Global North and South. It also fails to consider regional political conflict in parts of the Global South most vulnerable to climate change. In cases where states do not have the capacity to accept EDPs from neighboring states, or are equally affected by climate change, regional treaties may not help the countries that are most vulnerable to climate change. In the following section, I discuss the disparity in vulnerability between the Global North and South, using the research of Tracey Skillington, a sociologist whose research focuses on climate justice.

Legal violence and environmental colonialism

Skillington considers the lack of legal protection for EDPs as a form of "legal violence." She comes at the issue from a perspective of morality and human rights, and argues that the protection gap that exists for EDPs violates expectations of universal human rights law and the principles of cooperation upon which the human rights community is founded. In discussing the vulnerability differences between sending and receiving states, Skillington argues that most receiving states hold a significant responsibility for causing displacement due to the Global North's history of carbon pollution. [37] The industrialization of the Global North contributed immensely to global climate change, the results of which are most severely experienced by the Global South. Yet, Global North states shape responses that deny safe haven to EDPs. This denial amounts to legal violence as in many ways Global North states are denying protection to people harmed by their actions. Due to the temporal separation between the Global North's industrialization and the effects of climate change experienced by the Global South, culpability of the Global North is lessened, and denying safe haven can be seen as a right of sovereignty instead of legal violence. In the following section I will discuss an example where the U.S. has maintained its sovereignty while offering some limited assistance to EDPs from the Global South.

Domestic legal responses

While there is still no legal obligation based in international law to offer assistance to EDPs, some countries have initiated legislative mechanisms to offer relief to people fleeing natural disasters. This relief is usually in the form of temporary protection. The United States Immigration Act of 1990 (IMMACT) provides Temporary Protected Status (TPS) to people from a country where

[36] Ibid, 39.

[37] Tracey Skillington, "Climate justice without freedom: Assessing legal and political responses to climate change and forced migration." *European Journal of Social Theory* 18 (2015): 290-291.

conditions in that country prevent nationals from returning safely.[38] Conditions include earthquakes, floods, droughts, epidemics, or other environmental disasters that result in a substantial but temporary disruption of living conditions.[39] IMMACT reformed the Immigration and Nationality Act of 1965 and greatly expanded and revised legal immigration to the U.S.[40] U.S. Citizenship and Immigration Services may grant TPS to nationals of eligible countries who are already in the U.S. Individuals protected under TPS are not removable from the U.S., can obtain employment authorization, and may be granted travel authorization. They also cannot be detained for their immigration status.[41] For example, the U.S. designated 18 month TPS to Haitians residing in the U.S. after the 2010 Haitian Earthquake and granted TPS to almost 150,000 Nicaraguan and Honduran migrants who migrated after Hurricane Mitch. [42] [43] The main benefit of temporary protection measures is that EDPs in the U.S. from eligible countries are protected by *non-refoulment* until their home countries are safe to return to. Unfortunately, TPS is not applicable for many EDPs because they are usually displaced within their countries of origin.

Two key factors of TPS make it an unsuitable legal remedy for EDPs. First, TPS in the U.S. is highly discretionary, and the Secretary of Homeland Security must designate a country before its nationals are eligible for protection. Second, TPS only benefits people legally or illegally already in the U.S.[44] The U.S. granted TPS to migrants from Honduras and Nicaragua in 2003, five years after Hurricane Mitch in 1998. Most of those migrants had entered the U.S. illegally.[45] This second requirement makes TPS a challenging and uncertain resource for EDPs. The theory behind temporary protection for individuals fleeing unsafe conditions, however, is promising in relation to environmental displacement. It is yet to be seen if TPS measures will become an encouraged legal norm as the effects of anthropogenic climate change intensify.

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[38] "Temporary Protected Status." U.S. Citizenship and Immigration Services. Accessed February 05, 2016. https://www.uscis.gov/humanitarian/temporary-protected-status.

[39] Subramanian and Urpelainen, "Addressing cross-border environmental displacement: when can international treaties help?," 27- 28.

[40] Marianne Grin and Miguel Lawson, "The Immigration Act of 1990" *Harvard International Law Journal* 33 (1992): 255-257.

[41] "Temporary Protected Status." U.S. Citizenship and Immigration Services. Accessed February 05, 2016. https://www.uscis.gov/humanitarian/temporary-protected-status.

[42] McAdam, *Climate Change, Forced Migration, and International Law*, 182.

[43] Robert A. McLeman and Lori M. Hunter, "Migration in the context of vulnerability and adaptation to climate change: insights from analogues," *Wiley Interdisciplinary Reviews: Climate Change* 1 (2010): 451.

[44] "Temporary Protected Status." U.S. Citizenship and Immigration Services. Accessed February 05, 2016. https://www.uscis.gov/humanitarian/temporary-protected-status.

[45] McLeman and Hunter, "Migration in the context of vulnerability and adaptation to climate change: insights from analogues," 451.

Vulnerability and Socioeconomic and Political Factors of Environmental Displacement

EDPs are displaced due to the interplay of ecological and social vulnerability. The Intergovernmental Panel on Climate Change's (IPCC) definition of vulnerability is "the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes."[46] The IPCC, a scientific intergovernmental body established by the U.N., provides an ecological definition of vulnerability based on a 'system's' ability to cope. The United Nations Office for Disaster Risk Reduction uses a human-based definition. Their definition of vulnerability is "the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard."[47] Socioeconomic inequities exacerbate ecological vulnerability, and contribute to environmental displacement. An extreme environmental event becomes a disaster when it affects vulnerable communities.[48]

Racial and class inequities can make certain groups more vulnerable to climate change than others due to differing levels of protection and resilience. Resilience is "the ability of communities to absorb external changes and stresses while maintaining the sustainability of their livelihoods."[49] Lower resilience means a lessened capacity to adapt. In my case studies, I find that marginalized groups are less resilient than dominant groups. The IPCC defines adaptive capacity as "the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences."[50] For marginalized groups, a lessened capacity to adapt can lead to environmental displacement. I will use vulnerability indexes in my analysis of case studies to quantify different groups' varying levels of vulnerability.

Vulnerability indexes

A vulnerability index is a method of quantifying the vulnerability of groups, census tracts, countries, and other organizational units. The Social Vulnerability Index (SoVI) was developed by the Hazards and Vulnerability Institute at the University of South Carolina.[51] The index uses 30 U.S. Census tract

[46] IPCC Climate Change. *Impacts,, Adaptation and Vulnerability.* Contribution of working group II to the fourth assessment report of the Intergovernmental Panel on Climate Change 2007. Cambridge University Press, (2007): 883.
[47] "Terminology." The United Nations Office of Disaster Risk Reduction. Accessed February 07, 2016. https://www.unisdr.org/we/inform/terminology.
[48] Tacoli, "Crisis or Adaptation? Migration and Climate Change in a Context of High Mobility," 109.
[49] Adger et al., "Migration, Remittances, Livelihood Trajectories, and Social Resilience," 358.
[50] IPCC Climate Change. *Impacts,, Adaptation and Vulnerability.* 869.
[51] "Social Vulnerability Index." Hazards and Vulnerability Research Institute. October 30, 2013. http://webra.cas.sc.edu/hvri/products/sovi_details_2006.aspx.

variables, including race, age, median house value, immigrant population, and households without cars, to quantify vulnerability at the census tract level. The 30 variables contribute to a community's ability to respond to and recover from hazards.[52] The SoVI does not include ecological variables such as temperatures, land level above sea level, and level at risk for hydro-meteorological events. This allows for the comparison of the SoVI with individual ecological variables.

Geographic Information System (GIS) mapping of vulnerability indexes provide a useful tool for analyzing the overlap of ecological and social vulnerability. GIS visually presents data in maps. A study by Martinich et al., a climate scientist at the U.S. Environmental Protection Agency, combined the SoVI with a sea level rise coastal property model to determine if and where socially vulnerable population groups would experience disproportionate effects and burdens of adaptation to climate change induced sea level rise. They examined census tracts along the continuous U.S. coastline.[53] The study found that 22 percent of the population at risk of sea level rise is in the highest and second highest social vulnerability categories. Their analysis is that "socially vulnerable populations would be more likely to have fewer resources within their communities" to respond to the risk of sea level rise.[54] I argue that marginalized populations are more vulnerable to climate change because of discriminatory zoning practices and property value based protection decisions. This holds true in the U.S. and in developing countries.

Because data is less available for population areas in developing nations, I use the Wheeler Vulnerability Index (WVI), an index of the vulnerability of countries as a whole, to quantify vulnerability outside of the U.S. The WVI, created by environmental economist David Wheeler, considers the three main impacts of climate change (extreme weather changes, sea level rise, and agricultural productivity loss) and relevant political and economic factors.[55] Country indexes are useful for analyzing which countries may contribute higher numbers of environmentally displaced persons. Their main shortcoming, however, is that vulnerability can greatly vary for different populations and regions within a country. This is due to variance in geographic and social vulnerability of groups. For example in Bangladesh, rural communities on the southern coast of the country are much more vulnerable than the capital city of Dhaka. While indexes based on subnational population

[52] Ibid.

[53] Jeremy Martinich et al., "Risks of sea level rise to disadvantaged communities in the United States," *Mitigation and Adaptation Strategies for Global Change* 18 (2013): 171.

[54] Ibid, 177.

[55] David Wheeler, "Quantifying Vulnerability to Climate Change: Implications for Adaptation Assistance - Working Paper 240," 240 (2011).

areas such as U.S. census tracts reveal these differences, this information is less available in developing countries. Additionally even if it is available, census variables are not uniform across countries. Without a uniform list of variables, one index could not be used for different countries. The WVI shows us that Bangladesh and Somalia are vulnerable to climate change. I use qualitative research of population shifts and demographics to analyze socioeconomic and ecological differences of social groups within each country.

Coastal vulnerability and disaster relief

By examining the impact of hydro-meteorological disasters, I show that discrimination trends in spatial vulnerability manifest similarly in developed and developing countries. Hydro-meteorological disasters like hurricanes can cause mass destruction to homes and infrastructure. Research shows that lower social classes often suffer disproportionate levels of population displacement. Hurricane Mitch struck Central America in 1998 and displaced about 2 million people. Decades of civil conflict in the region left large populations of people impoverished and occupying marginal and hazardous lands in the countryside and peripheral urban slums."[56] People occupying these areas were considered vulnerable communities because of land characteristics like steep slopes prone to landslides and low-lying flood prone areas. Over a year after the storm, people continued to live in temporary dwellings around urban centers in Honduras, and migration out of the country after the hurricane tripled.[57] The underlying spatial inequities beforehand and population displacement after Hurricane Katrina in the U.S. Gulf Coast were very similar to the narrative of Hurricane Mitch. In New Orleans, marginalized populations did not live in vulnerable areas because of a civil conflict, but rather because of a history of racial segregation and redlining. Segregation laws in post-slavery New Orleans forced African Americans to live in low-lying areas like the Lower Ninth Ward, which put them at higher risk of flooding. The areas of New Orleans most at risk of flooding continued to be primarily inhabited by people of color in 2005 when Hurricane Katrina struck the Gulf Coast.[58] The hurricane displaced over 378,000 people and its 2008 population was 72 percent of its pre-hurricane population. Environmental justice scholars Bob Bullard and Beverly Wright note that the hurricane more severely affected African American households than it did white households.[59] African

[56] McLeman and Hunter, "Migration in the context of vulnerability and adaptation to climate change: insights from analogues," 452.
[57] Ibid.
[58] Earthea Nance, "Making the Case for Community-Based Laboratories," in *Race, Place and Environmental Justice After Hurricane Katrina,* ed. Robert Bullard and Beverly Wright. (Boulder: Westerview Press, 2009) 155.
[59] Robert D. Bullard and Beverly Wright, "Race, Place, and the Environment in Post-Katrina New-Orleans," in *Race, Place and Environmental Justice After Hurricane Katrina,* ed. Robert Bullard and Beverly Wright. (Boulder: Westerview Press, 2009) 30.

American and white populations were displaced at drastically different rates: "47 percent of African American households live someplace different, compared to only 19 percent of white households."[60] Hurricanes Mitch and Katrina demonstrate the importance of underlying socioeconomic inequities on migration following natural disasters. The migration outcomes from these two disasters were not random, rather particular demographic groups that were economically disadvantaged or marginalized were more likely to permanently relocate.[61]

Cost-benefit analysis based hazard protection decisions also perpetuate and exacerbate marginalized groups' vulnerability to climate change. In a cost-benefit analysis based protection decision, agencies or developers award resources for protection or resilience based on local property values. Protection in the form of beach nourishment or a levee would be awarded if the cost of installing the protective measure were less than the potential property loss without the measure in place.[62] Areas inhabited by marginalized communities often have lower property values. Therefore these communities suffer when protection decisions are made using cost-benefit analyses. For example, Martinich et al. find that highly socially vulnerable are more likely to be abandoned than protected in response to sea level rise.[63] These communities are abandoned because the cost of making them resilient is greater than the monetary value of lost property if a disaster strikes. In the U.S., The Army Corps of Engineers, a federal agency under the Department of Defense, plans and constructs most adaptive infrastructure. The responsibility for flood protection primarily falls with the Corps. The Corps requires cost benefit analyses to support or justify coastal infrastructure and nourishment projects. Where the cost of protection exceeds the benefit, abandonment is the estimated response.[64] This demonstrates how reliance on cost benefit analyses creates situations of environmentally displaced persons. People living in areas with lower property values, due to various inequities and historical injustices, are less likely to be protected in the face of a natural disaster. Though cost-benefit analyses can be useful, they should not be the primary method for making protection decisions.

The connection demonstrated above, between social and ecological vulnerability, reflects how a lack of social power influences population groups' ability to adapt to climate change and the likelihood of them being forced to migrate. In governance systems reliant on cost-benefit analyses for protection decisions, marginalized

[60] Ibid, 30.
[61] McLeman and Hunter, "Migration in the context of vulnerability and adaptation to climate change: insights from analogues," 453.
[62] Martinich et al., "Risks of sea level rise to disadvantaged communities in the United States," 175.
[63] Ibid, 169.
[64] Ibid, 175-176.

populations do not have the resources to protect their communities. Social hierarchies and oppression also keep marginalized groups ecologically vulnerable. In the aftermath of cyclone Aila in 2009, the location of support service in rural Bangladesh depended on the rural power structure and the influence of rural leaders."[65] In rural villages in Bangladesh, families voluntarily organized into mutual benefit associations. Leaders of these associations, known as *matabdars*, settled village disputes between associations. The social position of these associations and *matabdars,* based on factors such as income, literacy, and housing, had a significant influence on the location of cyclone relief services.[66] Marginalized groups lower in the rural power structure – those most landless and impoverished – did not have the social capital to acquire adequate disaster relief assistance. A lack of fair governance allows government agencies to make inequitable protection.

Vulnerability and governance

Effective governance can make a difference in whether a situation results in forced displacement or adaptive migration. This is because the effectiveness and equity of governance can determine whether migrants will return to their places of origin, or whether they will migrate and not return. In the immediate aftermath of rapid-onset events, people are able to return to their origins based on the effectiveness of governance to recover restore social, economic, and physical characteristics of the affected area.[67] McLeman claims a key lesson from Hurricane Katrina is that damage to housing and competency of institutional authorities to provide relief and recovery are key determinants of whether people return or migrate elsewhere.[68] Both of these are associated with disproportionate levels of vulnerability and the role of government.

I build off the ideas presented by McLeman, Bullard, and Mallick in my discussion of the relationship between environmental displacement and socioeconomic vulnerability. In the following section, I will discuss how local governance had weak efficacy in recovering social, economic, and physical characteristics in the aftermath of Hurricane Katrina in New Orleans, Cyclone Aila in Bangladesh, and the 2011 drought in Somalia, causing environmental displacement.

Case Studies

[65] Bishawjit Mallick et al., "Coastal livelihood and physical infrastructure in Bangladesh after cyclone Aila," *Mitigation and Adaptation Strategies for Global Change* 16 (2011): 636

[66] Bishawjit Mallick, and Joachim Vogt, "Social Supremacy and Its Role in Local Level Disaster Mitigation Planning in Bangladesh," *Disaster Prevention and Management* 20 (2011): 548.

[67] Warner, Koko. "Assessing Institutional and Governance Needs Related to Environmental Change and Human Migration." United Nations University (2010): 2.

[68] McLeman, *Climate and Human Migration: Past Experiences, Future*, 141.

Hurricane Katrina in New Orleans

Hurricane Katrina hit the United States Gulf Coast in 2005 and resulted in the evacuation or displacement of approximately 1 million people.[69] Many have termed the disastrous situation in New Orleans following the hurricane 'unnatural' or 'man-made.'[70] When New Orleans' levees failed, 80 percent of the city was flooded. Although evacuation rates from New Orleans do not vary greatly across demographic groups, the probability of returning varies significantly by demographic group. [71] More than a million people in the Gulf Coast were displaced, 600,000 of which remained displaced a month after the storm. A year after the hurricane, the city was at half its previous population. Since then it has been rising; the 2014 population was 79 percent of the 2000 population.[72]

Local vulnerability

The city of New Orleans is situated in the very ecologically vulnerable Mississippi River delta. McLeman describes the city before the hurricane as "three shallow bowls holding a half million people at or below sea level." A series of hurricanes in the twentieth century motivated the government to invest in protective levees to reduce the risk of storm flooding in the city.[73] The U.S. Army Corps of Engineers used a cost benefit analysis based on property values in the levee project plan. The environmental impact statement for the project issued in 1984 states that the Corps 1974 and the final statement was issued and approved in 1984. The statement calculated annual benefits as the difference between the expected costs of damage caused by hurricanes without the proposed projects and the expected costs with the projects. [74] Adaptation and investment decisions based on property values instead of population density resulted in inequitable levels of adaptation and increased ecological vulnerability for more socioeconomically disadvantaged neighborhoods. Consistent with the Corps' method for adaptation decision-making in the U.S., Martninch et al. found that when land value is higher than the cost of protection, the land will be protected through adaptive infrastructure. When the value of land is lower than the cost of protection, evacuation and abandonment will be the primary response to coastal threats. [75] The study's use of GIS

[69] Ibid, 95.

[70] Robert D. Bullard and Beverly Wright, "Introduction," in *Race, Place and Environmental Justice After Hurricane Katrina,* ed. Robert Bullard and Beverly Wright. (Boulder: Westerview Press, 2009) 2.

[71] Jeffrey A. Groen and Anne E. Polivka. "Going Home after Hurricane Katrina: Determinants of Return Migration and Changes in Affected Areas." Working Paper 428. U.S. Bureau of Labor Statistics. (2009). 15.

[72] Allison Plyer, "Facts for Features: Katrina Impact." Last modified August 28, 2015, datacenterresearch.org

[73] McLeman, *Climate and Human Migration: Past Experiences, Future*, 95.

[74] Detlof von Winterfeldt, "Using Risk and Decision Analysis to Protect New Orleans Against Future Hurricanes," in *On Risk and Disaster: Lessons from Hurricane Katrina,* ed. by Ronald J. Daniels et al. (Philadelphia: University of Pennsylvania Press, 2006), 30.

[75] Martinich et al., "Risks of sea level rise to disadvantaged communities in the United States," 175.

highlights where land that is likely to be unprotected or abandoned overlaps with a high social vulnerability index. They find that the Gulf Coast is the region in the U.S. with greatest intersection of population tracts with high social vulnerability and sea level rise risk.

New Orleans' hardest hit neighborhood was the predominantly African American Lower Ninth Ward. The city has a racially discriminatory historical geography, which concentrates black populations in ecologically vulnerable zones. After the Civil War, the rapidly growing numbers of African Americans in New Orleans were legally forced to live in low-lying areas such as the Lower Ninth Ward, which put them at greater risk of flooding and contamination. African Americans were redlined into low-lying land uninhabited by white people.[76] The effect of this redlining remains in place into present day. At the time of Hurricane Katrina in 2005, the low-lying areas were most at risk of flooding; New Orleans East, Lower Ninth Ward, and Gentilly, were primarily inhabited by people of color.[77] A history of racial discrimination placed minority New Orleans residents in a more ecologically vulnerable position than white residents.

Who did not return?

Analysis of racial differences in return rates suggests racially correlated ecological vulnerability and social capital. Within three months of the hurricane, half of white residents who had evacuated had returned to the city. Yet over a year after the hurricane less than half of black residents had returned.[78] Furthermore, only 38 percent of black evacuees from the entire affected Gulf Coast returned to their pre-Katrina counties, compared with 76 percent of white evacuees.[79] These racial differences in the pre and post Katrina populations remain significant ten years after the storm. According to the U.S. Census Bureau, there are now 99,650 fewer African Americans living in New Orleans and 11,494 fewer whites. The predominantly African American Lower Ninth Ward saw only 9.9 percent of its population return. Comparatively, affluent and predominantly white neighborhoods repopulated back to their previous populations, and some grew more populated than previous levels For example, the predominantly white neighborhoods of

[75] Ibid., 169

[76] Nance, "Making the Case for Community-Based Laboratories," 155.

[77] Ibid.

Martinich et al., "Risks of sea level rise to disadvantaged communities in the United States," 181.

[78] McLeman, *Climate and Human Migration: Past Experiences, Future*, 95.

[79] Groen, and Polivka. "Going Home after Hurricane Katrina: Determinants of Return Migration and Changes in Affected Areas," 16.

Garden District, the French Quarter, and Faubourg Marigny all had 2008 populations greater than before the hurricane.[80]

To be sure, return rates to different neighborhoods are related to levels of damage, but these too exhibit institutionally-reinforced racialized inequalities. Damaged areas in the city "were populated by 46 percent African Americans compared to 26 percent African Americans in the rest of the city."[81] The disparity in damage is related to ecologically discriminatory redlining of African American populations described above, and to the lack of adequate investment and protection in ecologically vulnerable areas with low property values.

Another factor in why affluent residents returned at a higher rate than low-income residents is homeownership and flood insurance. Groen and Polivka consider homeownership as "location-specific capital," an indicator of likeliness to return. Their analysis of the U.S. Census Bureau Current Population Survey following Hurricane Katrina finds that returnees were disproportionately homeowners compared with non-returnees.[82] However homeownership alone is not a strong indicator of whether people returned home. A comparison of the repopulation of two neighborhoods in Orleans Parish, the Lower Ninth Ward and the Garden District, reveals why homeownership is not a strong indicator.

The Lower Ninth Ward and the Garden District repopulated at very different rates. Based on U.S. Census data, the neighborhoods had similar homeownership rates but very different demographics. In 2010, 59 percent of housing units in the Lower Ninth Ward and 49.1 percent of housing units in the Garden District were owner occupied. The Lower Ninth Ward's number of total occupied housing units in 2000 was 4,820 and in 2010 was 1,061. The Garden District's number of total occupied housing units in 2000 was 1,117 and in 2010 was 1,063. Though the Lower Ninth Ward had a higher rate of homeownership than the Garden District, it repopulated at a much lower rate. The two neighborhoods had, and still have, contrasting race and income demographics. In 2000, the Lower Ninth Ward had an average household income of $37,803 and was 98.3 percent African American. The Garden District had an average household income of $124,688 and was 89.2 percent white.

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[80] Robert D. Bullard and Beverly Wright, "Race, Plane and the Environment in Post- Katrina New Orleans," in *Race, Place and Environmental Justice After Hurricane Katrina,* ed. Robert Bullard and Beverly Wright. (Boulder: Westerview Press, 2009) 30-31.

[81] Sheila J. Webb, "Investing in Human Capital and Healthy Rebuilding," in *Race, Place and Environmental Justice After Hurricane Katrina,* ed. Robert Bullard and Beverly Wright. (Boulder: Westerview Press, 2009) 145.

[82] Groen, and Polivka. "Going Home after Hurricane Katrina: Determinants of Return Migration and Changes in Affected Areas," 18-19.

[82] Webb, "Investing in Human Capital and Healthy Rebuilding," 149.

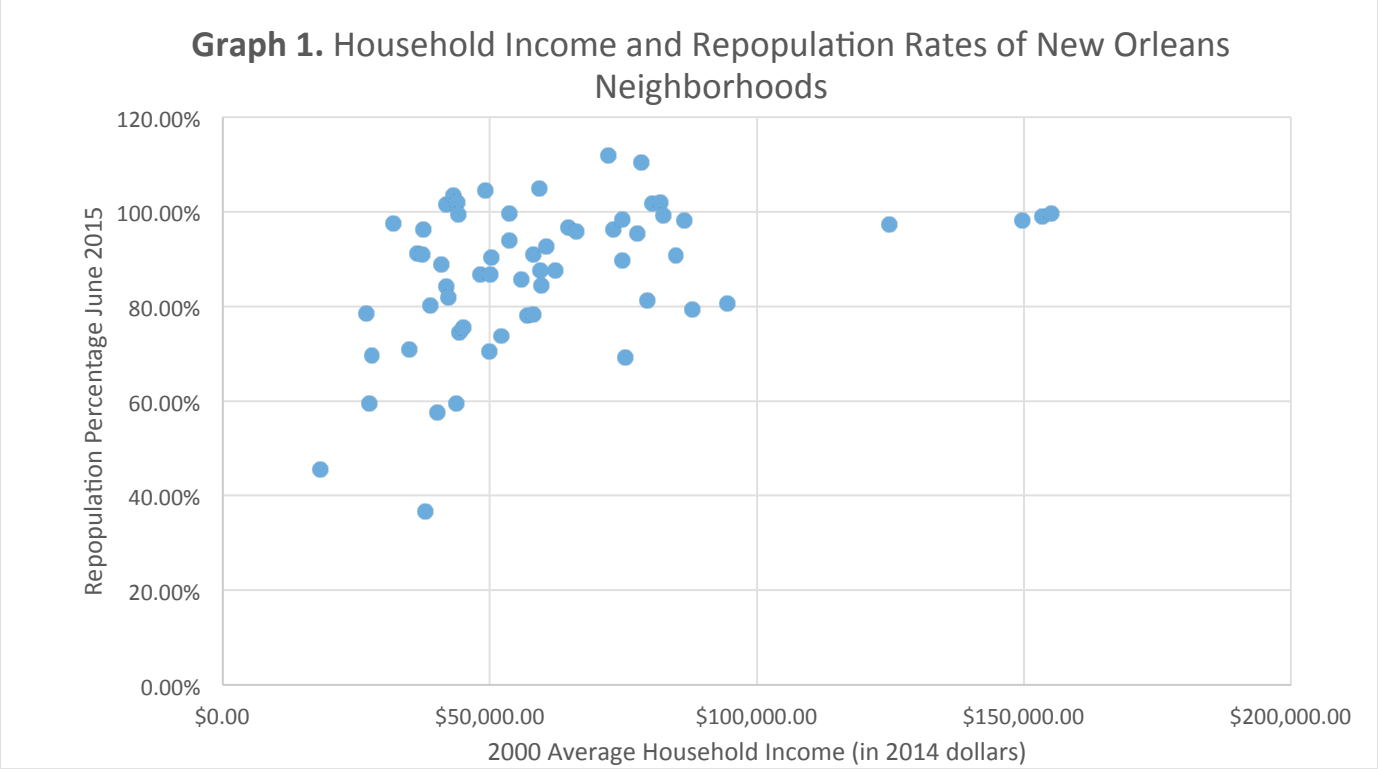
Owning flood insurance made it much easier for people to return to their homes in New Orleans. Homeowners with flood insurance could expect relatively quick and fair settlements to begin funding housing recovery. There is a positive correlation with household income and possessing flood insurance. The majority Lower Ninth Ward residents were low income and did not have flood insurance. The Louisiana Recovery Authority's The Road Home program was a grant program intended to provide funds to rebuild uninsured and underinsured homeowners.[83] Though the program was intended to compensate for the socioeconomic differences in flood insurance protection, its implementation was slow and ineffective due to numerous administrative obstacles, and it ultimately failed in achieving its goal. [84] McLeman states two key lessons from Hurricane Katrina are that:

damage to housing is a key determinant of whether people will return… or migrate elsewhere [and] the competency of institutional authorities to provide relief and recovery assistance is an important influence on how people adapt, especially the poor and marginalized.[85]

The relationship between lack of flood insurance with low-income people and low return rates demonstrates the importance of these takeaways. He also notes "strong social capital can overcome institutional inadequacy." [86] Low-income people also did have access to social capital to improve their situation and overcome inadequacies of the Louisiana Recovery Authority and FEMA. Bates and Green argue that government program design and implementation have maintained the bias towards well-insured homeowners with private resources, to the detriment of African American homeowners in the Lower Ninth Ward.[87] A difference in access to resources and capital made a big difference in who was able to return home.

Overall, the data shows a slight positive correlation throughout the city of average household income of neighborhoods and rates of return in those neighborhoods. In Graph 1, the repopulation percentage of neighborhoods is the change in number of houses receiving mail from June 2005 and June 2015. Households receiving mail is a useful indicator for analyzing the number of occupied homes.

[83] Lisa K. Bates and Rebekah A. Green, "Housing Recovery in the Ninth Ward," in *Race, Place and Environmental Justice After Hurricane Katrina,* ed. Robert Bullard and Beverly Wright. (Boulder: Westerview Press, 2009) 236-237.
[84] Ibid.
[85] McLeman, *Climate and Human Migration: Past Experiences, Future*, 103.
[86] Ibid.
[87] Bates and Green, "Housing Recovery in the Ninth Ward," 243.

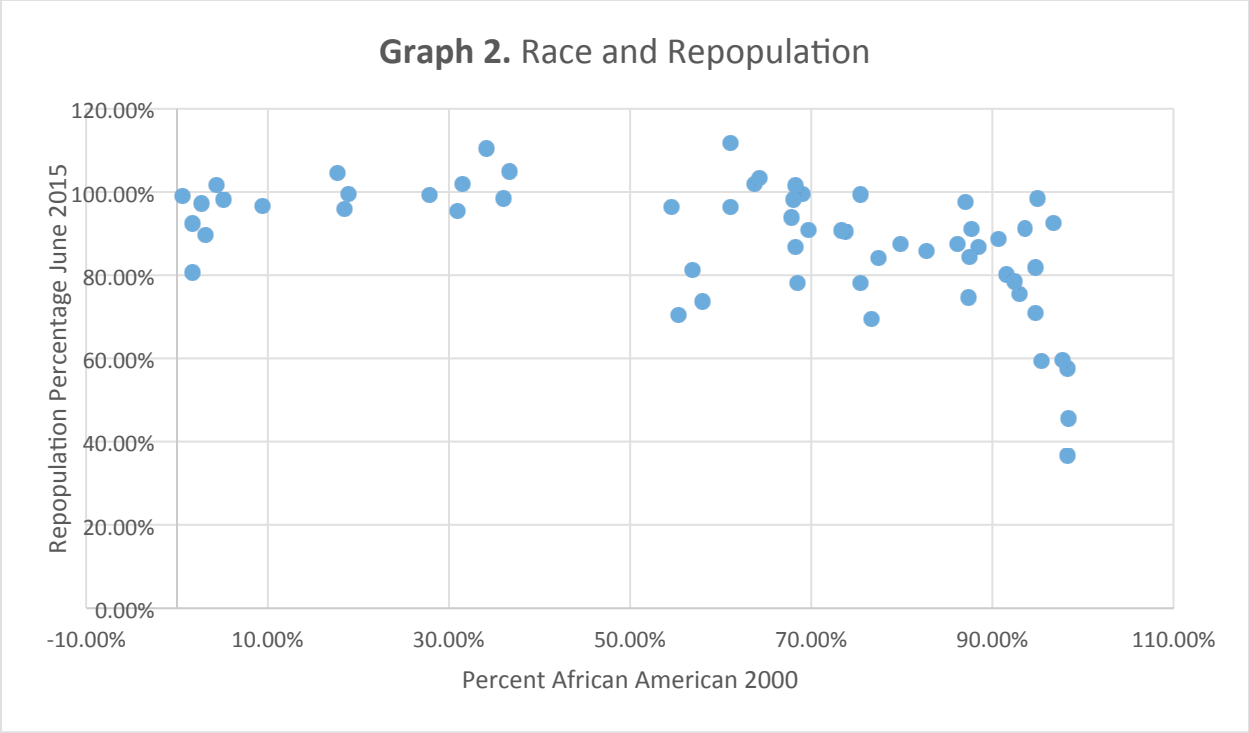


[88]

There is also a slight relationship between the racial makeup of neighborhoods and their repopulation rates. Graph 2 shows the relationship between the African American population of neighborhoods and neighborhood repopulation rates. Though the relationship is not quite a correlation, the data still shows us a racial difference in repopulation rates. All the neighborhoods with repopulation rates lower than 80 percent are predominantly African American and neighborhoods with lower than 60 percent repopulation are all over 90 percent African American.

Racial disparities in flood insurance coverage are also relevant in analyzing race and repopulation. Before Hurricane Katrina, African Americans were the least likely racial group in New Orleans to have flood insurance. This is due to insurance redlining of black neighborhoods. Because of the disparity in insurance coverage, fewer settlement funds went to rebuilding homes in black neighborhoods.

[88] Data source: U.S. Census 2000 Summary File 1 (SF1) and U.S. Census Population Estimates 2015

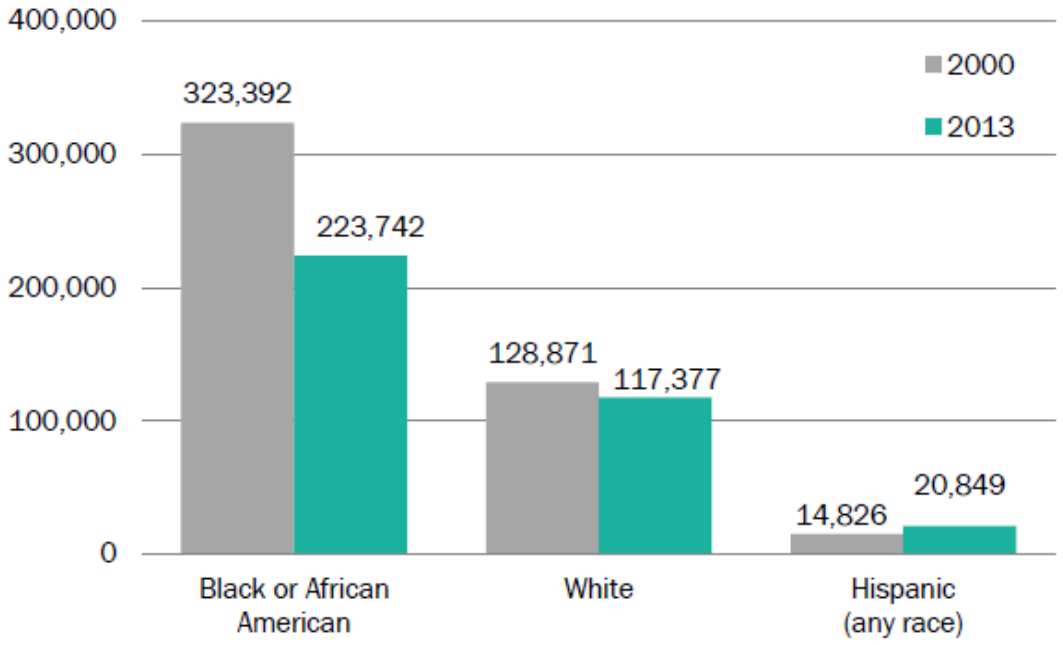


[89]

While helpful, the data on household repopulation does not give us the full picture of who left and who returned to New Orleans because it does not take into account gentrification after Hurricane Katrina. Graph 3 shows the difference in New Orleans' racial makeup before and after the hurricane. In 2000, New Orleans was 66.7 percent African American and 59.6 percent in 2010. Additionally, adjusted for inflation in 2014 dollars, the 2000 average income of New Orleans was $59,354 and 2014 average income was $62,880. For numerous reasons including the redlining of African Americans into ecologically vulnerable areas, discriminatory insurance practices, and a reliance on the private insurance sector to facilitate recovery, African Americans have returned to New Orleans at a much lower rate than whites.

[89] Data source: U.S. Census 2000 Summary File 1 (SF1) and U.S. Census Population Estimates 2015

Graph 3: Comparison of 2000 and 2013 populations of African American, white, and Hispanic populations of Orleans Parish.



Hurricane Katrina caused the evacuation of 70 percent of New Orleans. Evacuees were demographically representative of the city. Hurricane Katrina alone does not explain why return rates were so different along racial and income level lines. Marginalized groups in New Orleans had greater levels of exposure to the hurricane and lesser access to economic relief and social capital after the hurricane. The difference in access to resources plays a significant role in the disparity in return rates. Though the city is repopulating, ten years after the hurricane, the population is still well below its previous population. The demographics of the city have also shifted toward a greater number of whites. Who returned after evacuating and who did not demonstrates how marginalization causes environmental displacement and migration in response to climate disasters.

Cyclone Aila in Bangladesh

Cyclone Aila was a category 1 climate change induced cyclonic storm that hit the Bangladesh coast in 2009.[90] The storm displaced 2 million people, most of who returned to their villages after the cyclone. Bangladesh is one of the most, if not the most,

[90] M. Rezaul Islam & Mehedi Hasan. "Climate-induced human displacement: A case study of Cyclone Aila in the south-west coastal region of Bangladesh." *Natural Hazards, 81* (2016): 1053.

vulnerable country to climate change. It has a Wheeler Vulnerability Index score of 53 out of 100. The country is in the world's largest river delta, where the Ganges, Brahmaputra, and Meghna rivers converge.[91] Ten percent of its land is only 1 meter above sea level, making it particularly vulnerable to sea level rise. The Bangladeshi government constructed polders and embankments in the 1960s to protect against inundation from the sea.[92] In the 1990s, The World Bank funded the Bangladesh Coastal Embankment Rehabilitation Project, which aimed to further fortify the coast with embankments. These embankments, however, did not withstand the region's cyclonic storms.[93] Similarly to the levee breaches after Hurricane Katrina, Cyclone Aila toppled coastal embankments and flooded settlements.

Local vulnerability

Figure 1 demonstrates the increasing vulnerability of the southern coastal region of Bangladesh where Cyclone Aila hit. Islam et al. base their index of overall vulnerability on an aggregate of agricultural, climatic, demographic, occupational, and geographic vulnerability (vulnerability to hydro-meteorological disasters). They consider the southern districts of Bangladesh as 'very highly vulnerable.' As per Bangladesh's 2001 Census, the country's 19 coastal districts had a population of 36 million people of which 52 percent were classified as 'poor.'[94] The region's rural poor do not have access to adequate relief and rehabilitation resources after climactic disasters. The location of disaster relief support services in rural Bangladesh depends on the rural power structure.[95] As discussed previously, village associations gain power through their assets and income. Poor populations in rural southern Bangladesh are particularly vulnerable to being environmentally displaced because of their social vulnerability in the rural power structure and ecological vulnerability due to their location in the river delta.

[91] Katha Kartiki, "Climate change and migration: a case study from rural Bangladesh," *Gender & Development* 19 (2011) 24.

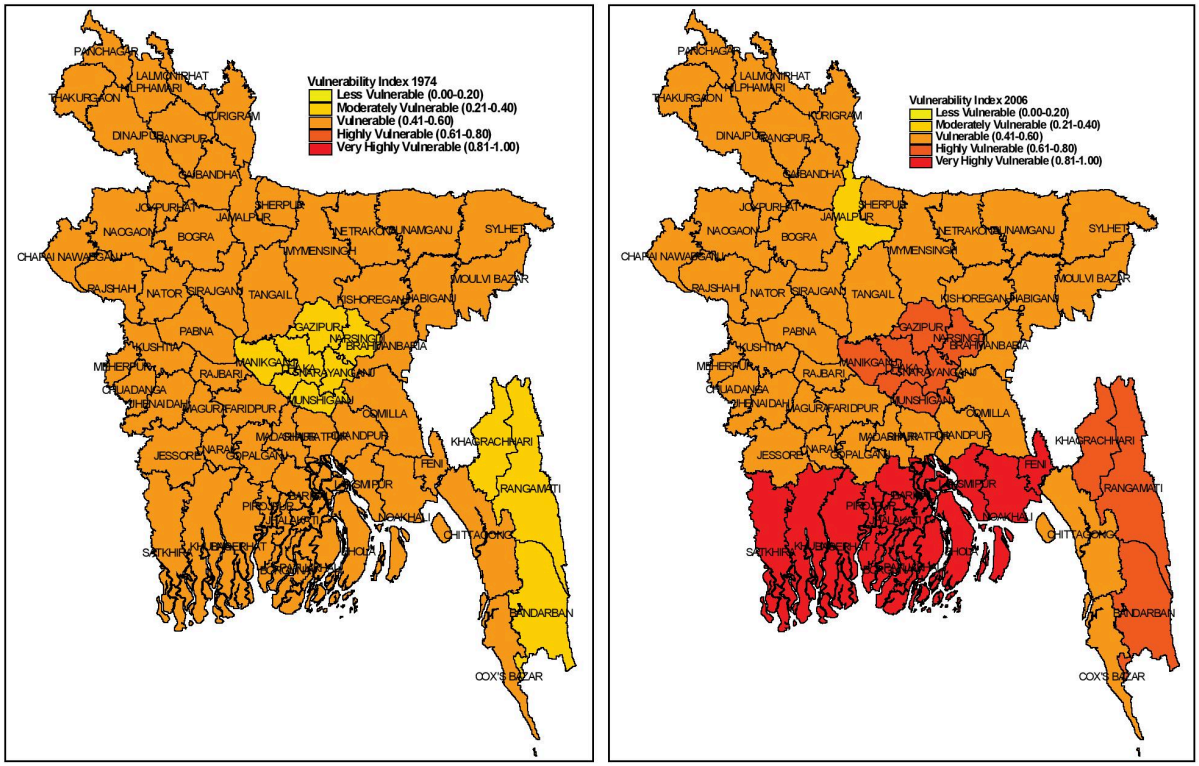
[92] Mallick et al., "Coastal livelihood and physical infrastructure in Bangladesh after cyclone Aila," 630.

[93] Kartiki, "Climate change and migration: a case study from rural Bangladesh," 27.

[94] Islam et al., "Vulnerability to Climate Change: Adaptation Strategies and Layers of Resilience – Quantifying Vulnerability to Climate Change in Bangladesh, " 24.

[95] Mallick et al., "Coastal livelihood and physical infrastructure in Bangladesh after cyclone Aila," 636.

Figure 1[96]



Source: Authors' calculation.

Map 6. Overall vulnerability in 1974 and 2006.

Bangladeshis are socioeconomically vulnerable to climate change at a national level because a majority of the population relies on the land for a living. Sixty-three percent of the population makes a living in the natural resource dependent sectors of agriculture, forestry, and fishing.[97] Though annual flooding in Bangladesh delivers agricultural productivity to rural areas, the rural population distinguishes between good floods, which nourish the land, and bad floods, which damage crops, housing, and shrimp ponds.[98] The cyclone severely damaged the economy of affected areas. The region's agricultural production was completely decimated, shrimp farms were washed away, and even personal gardens were destroyed, depriving most people not only of their income source, but also of their non-market earnings used for subsistence.[99] People in this region had lived off the land for generations. The effects of climate change and lack of government protection decimated their way of

[96] Islam et al., "Vulnerability to Climate Change: Adaptation Strategies and Layers of Resilience – Quantifying Vulnerability to Climate Change in Bangladesh, " 28.
[97] Kartiki, "Climate change and migration: a case study from rural Bangladesh," 25.
[98] McLeman, *Climate and Human Migration: Past Experiences, Future*, 129.
[99] Mallick and Vogt. "Cyclone, coastal society and migration: empirical evidence from Bangladesh." 223-224.

life. Years after Cyclone Aila, the land remains ruined and unsuitable for farming or living.

Rural Bangladesh also has ecological vulnerability trends similar to the redlined neighborhoods of New Orleans. According to Brouwer et al. the poorest and most socioeconomically marginalized populations in both urban and rural Bangladesh tended to occupy the most ecologically vulnerable regions. They found that floodplain residents have lower income levels than village averages. Their study determines that vulnerability can be determined by income inequality.[100] [101] This conclusion implies that equitable siting of homes can have similar levels of protecting people from climate disaster as physical infrastructure investments like embankments and levees. People in rural Bangladesh are at environmental risk because of their income level.

Data on migration patterns after the cyclone shows that migration was both necessary and unavoidable for poorer farmers in the region.[102] Initial migration patterns reflect that usually men would leave their families in the rural areas and try to find work in the southern cities: Khulna and Satkhira.[103] This left a greater population of women left in the region to maintain family land and attempt to make a livelihood with assistance from remittances. Even before the cyclone, the region was very poor. The government did not devote resources to building climate mitigating infrastructure to protect people and agriculture in the region. Due to lack of sufficient resources, it also did not devote resources to repairing embankments after the cyclone to make the region suitable for agriculture again.[104] Through this policy of resource allocation, the state has failed rural people by failing to protect minimum living standards.

Who did not return?

Demographic trends in return rates after Cyclone Aila also reflect the relationship between socioeconomic status and migration. A survey by Mallick and Vogt of 280 households in 12 villages affected by Cyclone Aila shows that migration decisions correlated with income levels. Respondents with a pre-cyclone monthly income of less than $30 had an 86 percent migration rate; those earning between $30 and $75 had 58 percent migration rate; and those earning over $75 had a 19 percent migration rate.[105] Another study by Islam and Hasan finds that 53.8 percent of Cyclone Aila migrants they surveyed said they left because of "damage of home and

[100] Roy Brouwer et al., "Socioeconomic Vulnerability and Adaptation to Environmental Risk: A Case Study of Climate Change and Flooding in Bangladesh," Risk Analysis 27 (2007): 320.
[101] McLeman, *Climate and Human Migration: Past Experiences, Future*, 131.
[102] Mallick and Vogt. "Cyclone, coastal society and migration: empirical evidence from Bangladesh." 234.
[103] Islam & Hasan. "Climate-induced human displacement: A case study of Cyclone Aila in the south-west coastal region of Bangladesh," 1057.
[104] Ibid, 227.
[105] Mallick and Vogt. "Cyclone, coastal society and migration: empirical evidence from Bangladesh." 226.

cultivable lands."[106] Both studies show there is a relationship between housing damage, income, and the decision to migrate. In the rural coastal areas surveyed, low-income households were likely homes made of clay, which did not withstand the cyclone. Higher income groups lived in homes constructed of more resilient materials.[107]

As in the aftermath of Hurricane Katrina, housing damage was a significant factor that kept people from returning home after Cyclone Aila. The storm destroyed coastal embankments, which submerged thousands of homes. These areas remained flooded a year after the storm, and 200,000 displaced people continued to live in temporary shelters. Around 250,000 houses were fully damaged, destroyed beyond repair, and about 400,000 houses were partially damaged. Kartiki writes that destruction of livelihood and destruction of household were the major reasons for migration after Cyclone Aila.[108]

Unlike in New Orleans, the primary driver of migration from coastal Bangladesh was loss of livelihood due to the ecologically vulnerable nature of the local economy. By damaging agriculture and shrimp farming, Cyclone Aila decimated the region's source of income. After government and NGO relief efforts had concluded, there was no sustainable income generation. This motivated male rural to urban migration. Kartiki, Mallick and Vogt use the term migration instead of displacement because the majority of migrants were males who moved to urban areas and sent money back to their families.[109][110] Male heads of household moved to nearby urban centers to earn money for their families. The migration was environmentally caused not because the ecological destruction itself displaced people, but because the cyclone decimated the local income source, and relief efforts did not include social protection.[111]

In the aftermath of Cyclone Aila, international and regional NGOs provided humanitarian aid such as food and water, however this was not sufficient protection and assistance. For EDPs of Cyclone Aila, there were no institutional supports from the government or from NGOs. EDPs lacked the assistance necessary to rebuild their livelihoods, both in their places of origin and in the places they migrated to.[112] Temporary relief aid could not have prevented migration, but it could have facilitated supportive and sustainable internal migration.

Kartiki finds that the migration from coastal Bangladesh was not a form of adaptation because it did not improve the overall

[106] Islam & Hasan. "Climate-induced human displacement: A case study of Cyclone Aila in the south-west coastal region of Bangladesh," 1062.
[107] Mallick and Vogt. "Cyclone, coastal society and migration: empirical evidence from Bangladesh." 229.
[108] Kartiki, "Climate change and migration: a case study from rural Bangladesh," 32.
[109] Ibid, 34.
[110] Mallick and Vogt. "Cyclone, coastal society and migration: empirical evidence from Bangladesh." 230.
[111] Ibid, 234-235.
[112] Ibid, 237.

resilience of households. She considers the economic migration as an instinctual reaction to a climate shock. Resiliency was not improved for various reasons including that if migrants moved to nearby villages, then the local economies were not much different than their home economies. If they moved to urban centers, their living expenses substantially increased and their households did not receive a significant economic benefit through remittances. Additionally in the majority of cases, the entire household did not migrate; only one or two primary wage earners migrated. This means that members of the household remained as ecologically vulnerable as they were before the disaster. Kartiki attributes Bangladesh's environmental migration from rural coastal villages to a lack of choice and agency.[113] Migrants do not choose to migrate in order to improve their overall situation; rather they are forced because they believe there is not a feasible alternative in their places of origin. EDPs fleeing drought in Somalia in 2011 faced a similar situation where they were forced to abandon their way of life because they found it no longer feasible.

Drought in Somalia

Somali pastoralists are a population group considered at high risk of being displaced across borders by drought, and are therefore a relevant population to study in analyzing environmental displacement. Similarly to disaster migration in Bangladesh, most drought-related migration is temporary labor migration.[114] Like other forms of environmental displacement, it is also multicausal, influenced by human decisions, and not simply the economic phenomenon of drought from lack of rainfall.[115] Migration in Somalia was influenced by a lack of rainfall and existing local political violence that exacerbated the effects of the drought experienced by poor pastoral communities.

The majority of people in central Somalia are nomadic pastoralists, making their livelihoods by rearing livestock.[116] Pastoralism as a livelihood has long been a way to sustain livelihoods in the unpredictable environments in the Horn of Africa.[117] Though droughts are regularly occurring natural phenomena, climate scientists believe droughts will intensify and increase in frequency due to anthropogenic climate change.[118] Because they are inherently nomadic, it does not seem intuitive that pastoralists can be

[113] Kartiki, "Climate change and migration: a case study from rural Bangladesh," 34-35.
[114] McLeman, *Climate and Human Migration: Past Experiences, Future*, 141.
[115] Justin Ginnettii and Travis Franck, "Assessing Drought Displacement Risk for Kenyan, Ethiopian and Somali Pastoralists – Technical Paper." Internal Displacement Monitoring Centre, Last modified April 26, 2014. http://www.internal-displacement.org/publications/2014/assessing-drought-displacement-risk-for-kenyan-ethiopian-and-somali-pastoralists. 12.
[116] Anna Lindley, "Questioning 'drought displacement': environment, politics and migration in Somalia," *Forced Migration Review* 45 (2014): 39.
[117] Tacoli, "Crisis or Adaptation? Migration and Climate Change in a Context of High Mobility," 109.
[118] McLeman, *Climate and Human Migration: Past Experiences, Future*, 146.

environmentally displaced. However they can and are being displaced. According to a study by the Internal Displacement Monitoring Centre, pastoralists are displaced by drought when pastoral livelihoods reach "a critical threshold below which pastoralism is not sustainable."[119] Somali pastoralists reached this critical threshold during their 2011 drought.

In 2011, Somalia simultaneously experienced severe drought, political violence, and governance failure, leading to displacement of a quarter of its population. The 2011 crisis in Somalia has been described as the 'perfect storm' due to the confluence of drought and governance failure.[120] Accordingly, drought migration from the country cannot be analyzed without considering the state of political violence and turmoil. The drought exacerbated the turmoil and the turmoil exacerbated poorer pastoralists' inability to make a livelihood. In response, pastoralists migrated to urban centers like Mogadishu, and out of Somalia to Kenya and Ethiopia.[121] The case of environmental displacement in Somalia is unique from the other two cases analyzed in this paper because many people were displaced cross-border to Kenya and Ethiopia.[122]

The multicausal nature of the crisis in 2011 influenced how the drought became an environmental displacement problem. A drought alone does not necessarily cause displacement. For example, regional droughts in Kenya and Ethiopia did not create famine and displacement, like the drought in Somalia did. The political turmoil and violence in Somalia left marginalized people vulnerable to famine and displacement.[123] The case of environmental displacement in Somalia is also unique from the previous two case studies because of the role of political violence and failed governance. The UNHCR registers many Somalis as displaced persons. According to the UNHCR statistics, there were 2,059,977 displaced Somalis in 2011. In UNHCR records, people may only list one reason for displacement. The vast majority of displaced persons from this crisis do not list 'drought' as the reason for their displacement. Graph 4 shows that from 2009-2012, the number of Somalis displaced by drought is a small fraction of the overall number of displaced Somalis.[124] The number is at its highest during the 2011 drought, but even that is only 10.6 percent of the total number displaced. Therefore despite frequent references to 'drought displacement' by politicians and the

[119] Ginnettii and Franck, "Assessing Drought Displacement Risk for Kenyan, Ethiopian and Somali Pastoralists – Technical Paper," 12.
[120]Lindley, "Questioning 'drought displacement': environment, politics and migration in Somalia,"39.
[121] Ibid, 41.
[122] Ginnetti and Franck, "Assessing Drought Displacement Risk for Kenyan, Ethiopian and Somali Pastoralists – Technical Paper," 16.
[123] Lindley, "Questioning 'drought displacement': environment, politics and migration in Somalia,"41.
[124] Ginnetti and Franck, "Assessing Drought Displacement Risk for Kenyan, Ethiopian and Somali Pastoralists – Technical Paper," 16.

media in the context of the 2011 humanitarian crisis, the displacement crisis had a much more nuanced cause.[125]

Graph 4: Number of Somalis Displaced Annually (2009-2012)

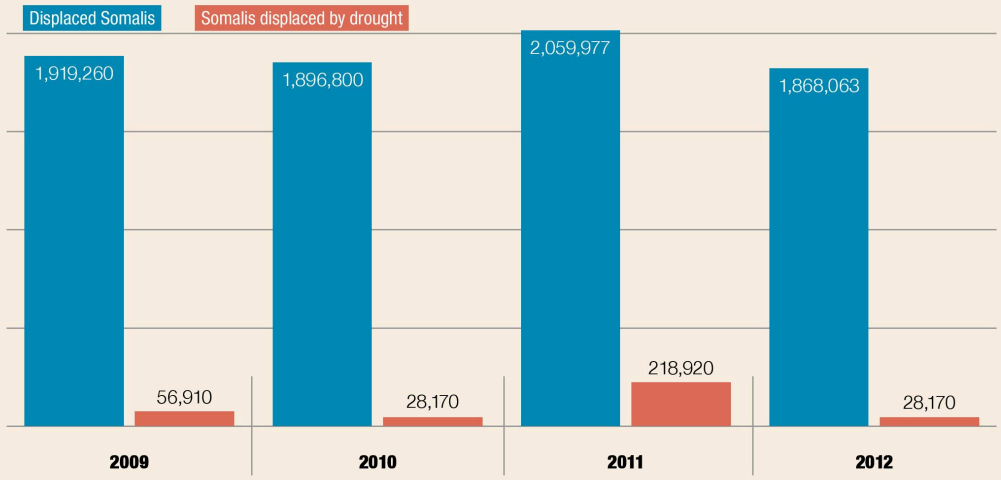


Figure 1.3: Number of Somalis displaced annually 2009-2012 (Source: UNHCR)

Lindley, a migration professor at the University of London School of Oriental and African Studies, argues that the reason the Kenyan government, the main receiver of displaced persons from Somalia, explicitly distinguished between refugees displaced by conflict and people displaced by drought was to implicitly circumscribe its legal obligation under international law.[126] Her argument is similar to the argument against referring to EDPs as climate refugees because the term does not allow for the consideration of marginalization and socioeconomic vulnerability. Rather, it places the blame solely on climate change. McAdam defines crisis migration as "a response to a complex combination of social, political, economic and environmental factors, which may be triggered by an extreme event but not caused by it." This definition is an accurate term to apply to the displacement crisis in Somalia.[127]

Environmental displacement in Somalia is important to study because of the highly vulnerable status of the country and because a number of refugees fleeing Somalia have listed drought as the reason for their displacement. However, the unstable status of the state and presence of political violence make it challenging to collect data on environmental displacement that is not influenced by political

[125] Lindley, "Questioning 'drought displacement': environment, politics and migration in Somalia,"41.
[126] Ibid, 41-42.
[127] McAdam, "The concept of crisis migration,"10.

instability and violence. Furthermore, some scholars suggest that climate change can exacerbate pre-existing violence and tensions in climate vulnerable countries because it puts a strain on resources. These factors can make it difficult to study environmental migration in Somalia independently of forms of persecution already covered under the 1951 Convention.

Discussion of case studies

The environmental displacement problems in the U.S. Gulf Coast, coastal Bangladesh, and Somalia were all multicausal, resulting from a combination of climate change induced natural disasters, socioeconomic vulnerability, and ineffective governance. No movement of people can be attributed to an environmental event alone. It is interesting that this relationship holds true in developed and developing countries.

There are similarities in vulnerability to climate change among marginalized groups in the U.S. Gulf Coast and in coastal Bangladesh. In both places, government policies placed marginalized populations in ecologically vulnerable areas. Poorer Bangladeshis are more likely to live in floodplains. Similarly, marginalized groups inhabited areas in New Orleans particularly vulnerable to flooding, like the Lower Ninth Ward. Economic and political discrimination concentrated both marginalized groups in these vulnerable areas. Another example demonstrating the many similar aspects of vulnerability to climate change is the structural vulnerability of homes. Marginalized groups in New Orleans and Bangladesh had homes more vulnerable to climate change because of lack of access to insurance and to resilient construction materials, respectively.

The evidence I present suggests that people in developed and developing countries had different primary reasons for migrating or not returning. In the developing countries of Bangladesh and Somalia, inability to maintain livelihoods motivated migration. People left their places of origin in order to support their families. Cyclone Aila decimated the local land dependent economy and livelihood, driving people to migrate for labor opportunities to maintain their livelihoods. In Somalia, the drought made pastoralism, the predominant form of livelihood for most Somalis, no longer feasible. Coupled with political violence, this led to a situation of widespread hardship and famine in the country, forcing people to flee to internal displacement and refugee camps. This form of labor migration in developing countries is also likely to be temporary. This is not necessarily the case in developed countries. In this paper I do not consider evacuees who returned to New Orleans after Hurricane Katrina as EDPs. I only consider those who left New Orleans and had to resettle elsewhere as EDPs. Inability to sustain livelihoods due to lack of labor opportunities, though somewhat relevant due to the temporary decline in fishing and tourism industries, was not a driver

of migration in New Orleans to the same extent that it was in Bangladesh and Somalia. I find that the lack of economic and labor opportunities is the main difference between environmental displacement in developing and developed countries.

Evidence from the cases suggests that environmental displacement will likely be domestic and not international. Despite its proximity, there was very little migration to India from coastal Bangladesh after Cyclone Aila. Though Somalis were displaced cross-border, this was likely owing to the political violence and the region's history of cross-border pastoralist movement. People in New Orleans and Bangladesh responded to hydro-meteorological disasters with domestic migration. Consequently, policy responses to environmental displacement should focus on domestic resettlement as that is the more common response.

Policy Implications

As the impact of anthropogenic climate change becomes increasingly visible, governments are addressing policy to adapt to the changing world. Climate change mitigation cannot prevent the likely rise in frequency of environmental displacement. Policy aimed at addressing environmental displacement should not attempt at an 'environmental fix.' Seeing as the problem is multicausal, policies addressing it must target the different layers of the problem. These include disparate ecological vulnerability, socioeconomic vulnerability and marginalization, and disparities in adaptive capacities. This section will not attempt to provide specific policy solutions, as these are beyond the scope of the paper, but rather will provide important considerations in creating policy solutions. Policy solutions should be guided by human rights not humanitarianism. Policy makers should take this approach by considering climate change adaptation, economic vulnerability, and cross-border legal responses within a human rights framework.

Human rights approach

EDPs are not victims of climate change in need of humanitarian aid. They need to be seen as humans and be treated with dignity. The U.N. Charter recognizes the inherent dignity and worth of the human person.[128] This principle is further recognized by the International Covenant on Economic, Social and Cultural Rights (ICESCR).[129] Humanitarianism address temporary problems with responsive solutions, human rights address permanent problems with permanent pro-active solutions and policies. Anthropogenic climate

[128] United Nations, *Charter of the United Nations*, 24 October 1945, 1 UNTS XVI, available at: http://www.refworld.org/docid/3ae6b3930.html

[129] United Nations, *International Covenant on Economic, Social and Cultural Rights*, 16 December 1966, United Nations, Treaty Series, vol 993, available at: http://www.refworld.org/docid/3ae6b36c0.html

change has begun it course and no state or intergovernmental body can prevent its effects. Climate change induced displacement is therefore a permanent problem and requires a permanent durable solution.

There is a consensus among scholars and intergovernmental organizations that climate change will undermine the realization of internationally protected human rights such as the right to health, food, and shelter.[130] [131] Furthermore, climate change will most severely impact those who already suffer from insufficient human rights protections. [132] Policy makers should address climate change induced displacement by targeting the inequitable enjoyment of human rights. They must take a human rights approach to lessen vulnerability to climate change before disasters and establish requirements for permanent and sustainable resettlement of EDPs after disasters.

A human rights approach to development and decision-making requires decision makers to focus on who has not benefitted from development and who has been excluded.[133] My evidence demonstrates that EDPs are displaced due to the role of pre-existing conditions of inequality and vulnerability that were in place before natural disasters. Policy must attempt to make people less vulnerable by protecting their economic, social and cultural rights. Additionally, Kolmannskog suggests that a human rights approach is better suited for addressing vulnerability than a policy focused on displacement itself. [134] Policy that only addresses post-disaster displacement runs the risk of only protecting a narrowly defined group of people and excluding other vulnerable people.[135] A human rights based is more valuable than narrowly defining environmental displacement or distributing relief aid to EDPs. States must address the underlying conditions of inequality and vulnerability before a natural disaster takes place.

Adaptation and resilience

States can lower vulnerability by improving adaptation and resilience. Migration in response to an environmental event is often considered an extreme form of adaptation or attempt at adaptation to the adverse effects of climate change. Migration is a costly and

[130] Stephen Humphreys, "Introduction." in *Human Rights and Climate Change,* ed. Stephen Humphreys and Mary Robinson. (Cambridge: Cambridge University Press, 2009) 1.

[131] IOM, "Migration and Climate Change," IOM Migration Research Series, 31 (2008).

[132] Humphreys, "Introduction," 1.

[133] Robert Archer. "Linking Rights and Development: Some Critical Challenges." in *Rights-based approaches to development : exploring the potential and pitfalls,* ed. Samuel Hickey and Diana Mitlin. (Sterling, VA: Kumarian Press, 2009) 29.

[134] Kolmannskog, "Climate Change, Environmental Displacement and International Law," 1077-8.

[135] Ibid.

unfavorable endeavor, and therefore is not usually an adaptation method of first resort except in the most extreme circumstances.[136] Research by the World Bank finds that urban slum dwellers gain more from slum upgrading than from relocation. [137] This is an example of a particularly underserved population where costs of relocating are relatively low compared to costs of adaptive infrastructure. Increased adaptive infrastructure is more sustainable than relying on evacuation as a response to environmental events. Adaptive infrastructure creates resilience, "the ability of communities to absorb external changes and stresses while maintaining the sustainability of their livelihoods," and is a worthy investment for countries most vulnerable to climate change. [138] In their discussion of post Cyclone Aila recovery, Mallick et al. state that improving physical infrastructure is the most important means of preventing environmental displacement in Bangladesh. [139] Physical infrastructure is not the only area in which governments can make improvements in adaptation. Proper informational networks are also an important part of adaptation, especially when evacuation continues to be the primary response to natural disasters. The dispersal of information is vital to disaster response and adaptation, and it is much less resource intensive than constructing adaptive infrastructure.

Economic vulnerability

In both Somalia and Bangladesh, marginalized people were displaced because their livelihoods were dependent on ecology and highly vulnerable to the effects of climate change. This is especially true in developing countries where household income and subsistence is often closely tied with productivity of land. In rural areas where the majority of people's livelihoods are dependent on ecology, migration is often a household strategy to diversify risk. Remittances that migrants send to their families in their places of origin play a key role in this.[140] Instead of relying on this as an adaptation strategy, governments should consider investing in diversifying local economies and making them less dependent on vulnerable ecology. As Kartiki notes, labor migration in response to natural disaster does not improve the overall resilience of households. Relief aid will not suffice to better livelihoods and foster economic opportunities. A diversified economy would improve communities' overall resilience to climate change by making households less dependent on ecologically sensitive land for their livelihoods.

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136 McLeman and Hunter, "Migration in the context of vulnerability and adaptation to climate change: insights from analogues," 455.

137 Judy L. Baker, *Climate change, disaster risk, and the urban poor cities building resilience for a changing world* (Washington, D.C.: World Bank, 2012), 77.

138 Adger et al., "Migration, Remittances, Livelihood Trajectories, and Social Resilience," 358.

139 Mallick et al., "Coastal livelihood and physical infrastructure in Bangladesh after cyclone Aila," 646.

140 Lori M. Hunter et al., "Environmental Dimensions of Migration," *Annual Review of Sociology* 41 (2015): 380.

Policies to make vulnerable communities less economically vulnerable should invest in and develop industries that are not ecologically sensitive. There are numerous examples of foreign investment in Bangladesh's shrimp farming industry because of the high global demand for shrimp. The U.S. Agency for International Development (USAID) funds a program called The Bangladesh Youth Employment Pilot project. This program trains youth for jobs or self-employment in the shrimp farming industry.[141] In the context of environmental displacement, this is an unsustainable and inequitable allocation of development resources because of coastal Bangladesh's high risk of hydro-meteorological disasters. To build communities' resilience, job training programs for rural communities should focus on industries resilient to cyclones and therefore not dependent on the land.

Cross-border responses

Though environmental displacement will remain primarily internal, states should take action to accept cross-border EDPs. I do not argue for expanding the 1951 Convention Relating to the Status of Refugees because the convention is not a well-suited legal solution for the problem. The Convention is a humanitarian convention that addressed the temporary problem of refugees resulting from WWII. Though refugees today invoke the Convention today for reasons unrelated to WWII, they still invoke it for temporary problems like war and genocide.

I do support other international legal remedies. Seventy-one states have signed the ICESCR and its provisions are considered customary international law. Article 11 of the ICESCR recognizes a right to an adequate standard of living, which includes food and housing.[142] This right justifies the need for permanently resettling EDPs internally if possible, or internationally if the displacement is cross-border. A commitment to international human rights includes a commitment to resettling EDPs. Regional treaties, as discussed by Subramanian and Urpelainen, are also well-suited ways of approaching cross-border displacement. Countries within geographic regions often have similar levels of climate vulnerability, making them more likely to cooperate with each other and accept EDPs. Cultural similarities and alliances may also strengthen regional EDP treaties. TPS is another good example of addressing displacement from natural disasters. States should build upon existing TPS measures and consider programs that do not require TPS beneficiaries to already be residing in host countries. International legal remedies are unable to address the underlying social inequities that cause displacement, but

[141] "Bangladesh Youth Employment Pilot," Educational Development Center, Inc. Accessed February 07, 2016. http://idd.edc.org/sites/idd.edc.org/files/Bangladeshpercent20BYEPpercent20Resultspercent20EDCpercent20Web.pdf.

[142] United Nations, *International Covenant on Economic, Social and Cultural Rights.*

they can provide sustainable assistance options for those who have been displaced.

Conclusion

Ultimately for a policy addressing environmental displacement to be successful, it must address the preexisting conditions of inequality that make people vulnerable to the effects of climate change. Bob Bullard, known as the father of environmental justice, notes that in responding to natural disasters, "it is far easier for the Army Corps of Engineers to retrofit and rebuild levees than it is for other government agencies to root out racial injustice, dismantle centuries of mistrust, and rebuild 'community.'"[143] While environmental infrastructure projects are important, they alone will not necessarily make people less vulnerable to environmental displacement. Addressing inequality and housing discrimination are just as important, if not more important, as building levees. When looking at environmental displacement, it is clear that racial, economic, and social injustices are environmental problems as well. Due to the multicausality of environmental displacement, policy solutions should be holistic rather than focused on particular drivers of movement.[144] In planning for climate adaptation, decisions makers should consider the bigger questions of what makes people vulnerable and why particular groups of people are more vulnerable than others. They should be guided by the principles of 'human rights' and 'dignity' to raise the resilience of vulnerable communities.

[143] Bullard and Wright, "Introduction," 2.
[144] McAdam, *Climate Change, Forced Migration, and International Law*, 146.

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