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Climate Migration: The Global Shift Toward Environmentally Driven Movement and Displacement

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Abstract

The global climate is expected to change drastically in upcoming decades, affecting social, economic, and environmental processes and behaviors. Current inequities will be amplified and exacerbated by climate change, and foundational structures and systems of humanity are expected to be highly impacted. Among these expected changes is the issue of human displacement due to extreme weather events, high temperatures, increased precipitation, and civil strife resulting from resource scarcity. This climate-induced movement is termed 'climate migration'. This paper focuses on the history of migration and its effects, current climate migration stories and patterns, and equity in climate resilience and adaptation planning using the three pillars of sustainability as defined by the Environmental Protection Agency. The present study suggests there is a deep need for a clear, global, legal, definition of a climate refugee. Furthermore, it is necessary to create one or more international, as well as intranational, organizations that aim to protect the rights and wellbeing of climate migrants.

1. Introduction

There is broad scientific consensus that human action is responsible for an unprecedented and ongoing global climatic shift.[1] According to the IPCC Sixth Assessment Report released in 2021, it is "...unequivocal that human influence has warmed the atmosphere, ocean and land".[2] Furthermore, the same report details that temperatures, precipitation, extreme weather events, and sea levels have all greatly increased as a direct result of human industrialization and global activity.[3] The consequences of these climatic changes are dire, and disproportionately affect communities based upon race, class, gender, and more.

Today, 1% of the world is a barely livable hot zone, and by 2070, that portion could go up to 19%.[4] The United Nations and others warn that in the worst case, the governments of the nations most affected by climate change could topple as whole regions devolve into war as resources become scarce and temperatures rise.[5] A potentially devastating issue created by this shift in climate is that of human migration and displacement. In the most extreme climate scenarios, more than 30 million migrants would head toward the U.S. border over the course of the next 30 years.[6] People may move because of rising sea levels, disrupted economies, destruction resulting from extreme weather results, conflict due to resource scarcity, or dozens of other manifestations of climate change. These moves may be sudden or gradual, with some populations moving preemptively and some moving retrospectively. The migrations may happen internationally or domestically, depending on the nature of the situation. Lastly, these moves may be forced or voluntary, due to circumstances like government collapse and poor resource distribution, or due to preferred climate and lifestyle.

This paper aims to show that it is important to prepare and adapt to these changing circumstances, with equity as a driving force in the planning process. Current inequities will only be exacerbated and amplified by climate change, making life for impoverished, Black, Indigenous and People of Color (BIPOC+), geographically isolated, and aging

populations more difficult.[7] There are considerable uncertainties surrounding the exact effects of climate change, yet it is clear that there will be changes to the global community in economic, social, and environmental capacities, which are covered in the following sections.

1.1. Economic Implications of Climate Change

The gross domestic product (GDP) of many nations around the world are expected to be affected by climate change, as shown in Figure 1.[10] The figure shows different levels of economic impact; lower income and developing countries are expected to be burdened with disproportionately higher economic devastation. Countries with pink to red coloration represent places with changes in GDP, clearly representing more dramatic impacts in the Global South and Sub-Saharan Africa.

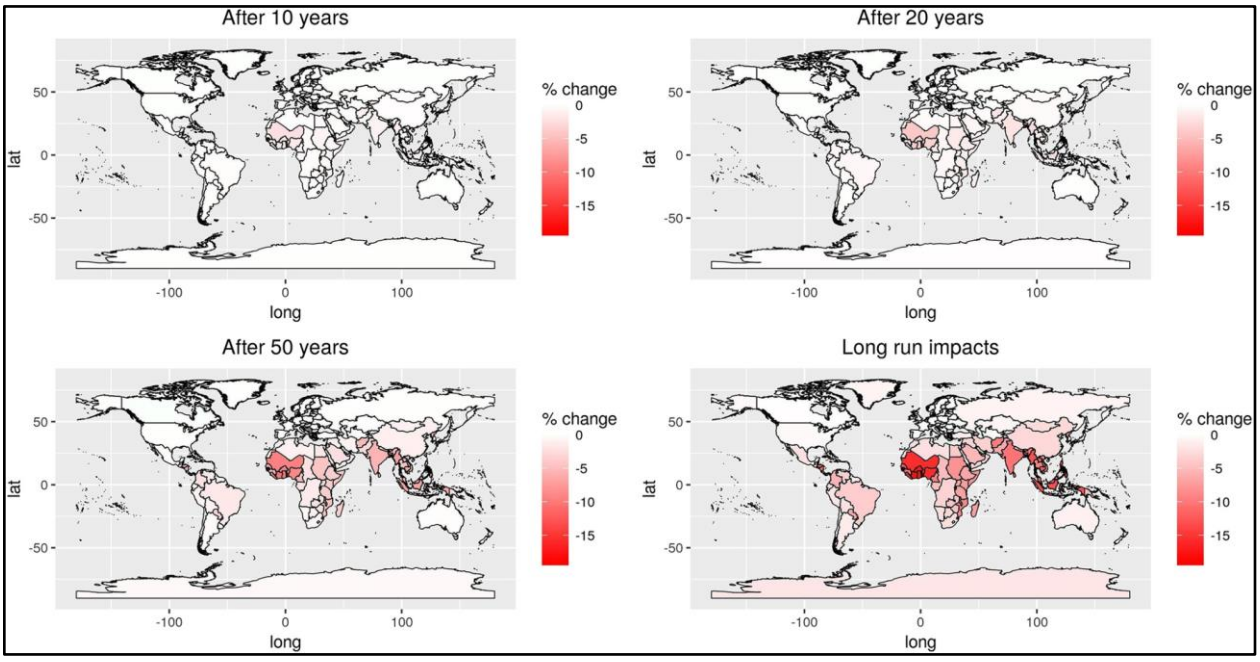


Figure 1: Change in GDP resulting from climate change (particularly an increase of 3°C globally)[11]

Agriculture will likely be the most affected sector, with billions of dollars lost due to changes in growing season, temperature variability, extreme weather, and increased rates and severity of precipitation.[12]

1.2. Environmental Implications of Climate Change

The environmental implications of climate change are also alarming. Changes in the atmosphere and oceans have an immense impact on Earth's biosphere, including loss of biodiversity, nutrient depletion and cycling disruptions, changes in growing season, dampened evolutionary response, and loss of ecosystem services.[13]

Climate change acts as a type of planetary overloading mechanism that invokes a positive feedback loop. As temperature increases, so do greenhouse gas emissions, which then increase temperature, and so on. This feedback loop endangers the lives of all species on earth, as well as the geological and natural processes on which they depend. Ocean acidification, sea level rise, extreme heat, species death, and soil nutrient depletion are only some of the changes expected to arise due to climate change. This makes growing food, finding clean water, breathing fresh air, and existing in a liveable climate incredibly difficult.

1.3. Social Implications of Climate Change

Climate change acts as a multiplier of existing vulnerabilities and inequities, making those who are already struggling to survive even more at risk for negative consequences. The most vulnerable regions are also the ones who are least responsible for the ongoing crisis, which include the Arctic due to projected warming, Sub-Saharan Africa due to low adaptive capacity and expected increases in rainfall, small island countries due to under-resourced infrastructure and sea level rise, and certain areas of Asia due to high population and expected increases in extreme weather patterns.[14] All of these regions face current challenges due to geopolitical contexts that have left them under-resourced, isolated, disempowered, or generally in turmoil.

Disparities resulting from environmental issues are already rampant at both a global and national scale. For instance, three months after Hurricane Irma touched down in Puerto Rico, around half of the island's population remained without electricity and without formal support from the rest of the United States.[15] In August of 2017, 40 million people in Bangladesh, India, and Nepal, some of the poorest nations on earth, were affected by extreme flooding that killed 1,200 people and left countless others exposed to flood-related agricultural and industrial pollution.[16] This negligent response to extreme climate events is a glimpse into the future as far as reaction and planning go in regards to environmental degradation and disaster.

2. Defining Climate Migration

The social, environmental, and economic implications of climate change all point to the fact that many people and communities will need to relocate in some capacity, whether it be in search of new financial opportunity, breathable air, or human rights. These people have yet to be given a formal legal definition, but for the sake of this paper they will be deemed 'climate migrants' or 'climate refugees'. For this paper, a climate refugee will be defined as a person who is migrating or moving, either temporarily or permanently, due to climate-related disasters and changes. It is important to note that usually migrants are moving by choice, whereas refugees are being forced to move by sudden events

The United Nations High Commissioner for Refugees (UNHCR) defines a refugee as "a person who has crossed an international border owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion", and in certain circumstances, this definition can be expanded to include persons who are "fleeing events seriously disturbing public order.[17] This definition lacks a direct and conspicuous reference to environmental disaster, though it can be argued that climate change is indeed the result of political forces. It is expected that movement will typically involve internal displacement, though it is important to note the possibility of international movement in response to a shifting environment.[18]

The term "migrant" is not yet legally defined under international law, however is defined by the International Organization for Migration as, "a person who moves from one place to another, especially in order to find work or better living conditions".[19] This definition is broader, and has more capacity to include people moving due to shifts in their environment than the definition of a refugee. For the purposes of this paper, a climate migrant is someone who moves, regardless of distance or borders, in search of a more liveable climate.

3. Historic Migrations: Learning From The Past

Detailed below are major historical human migrations, as well as their implications and consequences. These human movements provide insight into what migration can mean for society. Be it shifts in demographics, major economic downturns, or geographic isolation, previous human migrations allow for learning from past mistakes, and prioritizing the protection of migrants and refugees in more equitable ways. By comparing past migrations and contrasting them to predicted climate migration, it is possible to better prepare and implement resilience efforts.

3.1. The Great Migration of African Americans in the United States

During the twentieth century, more than seven million African Americans left their homes in the south to resettle in northern and western states.[20] This mass migration led to urbanization in the north, and shifting demographics where minorities, particularly Black individuals, were becoming higher in number and altering the population of northern

cities. During the first three decades of the twentieth century, labor shortages encouraged companies to reduce customary whites-only hiring restrictions.[21] This led many African Americans to move north in search of better jobs and financial opportunities, as the south was still ridden with explicit racism and discriminatory policies. Migration slowed in the 1930s, but skyrocketed in the 1940s after World War II.

James Gregory, a professor of migration studies at the University of Washington, explored the idea of the Black Metropolis, a unique set of community behaviors and values that makeup Black city life during the 20th century. Eight metropolitan areas (New York-Newark, Philadelphia-Camden, Chicago-Gary, Detroit, Cleveland, St Louis, Los Angeles-Long Beach, San Francisco-Oakland) had become home to 1,003,000 black southerners by 1940, which was two out of every three southern-born African Americans living outside the South.[22] This represents a critical shift in demographics that helped alter both political and social norms in these major cities. This mass migration is potentially one of the largest reasons for desegregation efforts that were backed by whites, and certainly a contributing factor to the birth of the Civil Rights movement.

The culture of The Great Migration was relatively welcoming, compassionate, and encouraging of Black southerners to join the communities up north.[23] This approach to migration helped build community, solidarity, and political power in the Black community. In other words, using an open approach to migration rather than a restrictive one allowed Black folks to build power and relationships that aided in their fight for liberation.

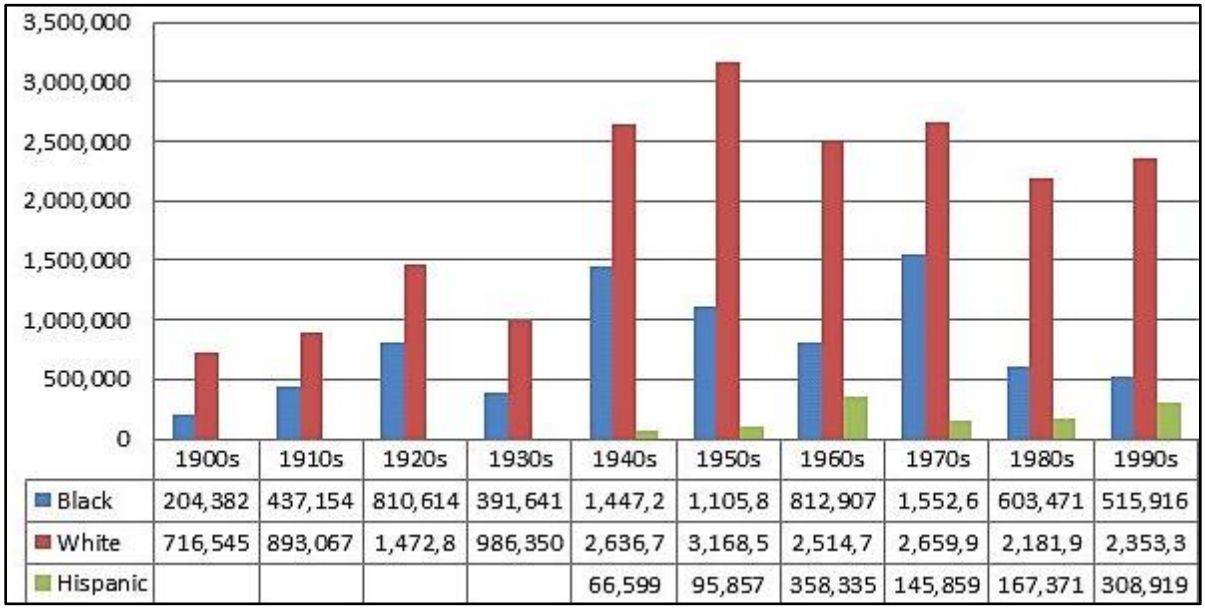
3.2. Rural Exodus During American/European Industrialization

The Rural Exodus happened during American and European industrialization, when many people moved from agricultural sectors to development and industrial sectors, which then led them to relocate to urban areas. This strained the resources of cities, causing shifts in demographics, scarcity in food networks and transportation, and limited access to important resources like healthcare and education.[24] While individual benefits of increased wages may outweigh the costs of migration, if too many individuals migrate to urban areas without proper urban planning tactics, it can cause negative effects such as overcrowding and unemployment on a national level.[25]

3.3. World War II and Globalization

In the period following World War II, many different mass migrations occurred, such as those linked to economic growth in peripheral countries, such as Italy and Spain, converting former emigration states to immigration ones.[26]

During the 20th century in the United States, 28.6 million southerners migrated to the north, 8 million Black folks and about 20 million whites.[27] Figure 2 shows the distribution of migrants in the United States by race and by decade during the 20th century, displaying a clear spike in the 1940s and 1950s.[28]



	1900s	1910s	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s
Black	204,382	437,154	810,614	391,641	1,447,2	1,105,8	812,907	1,552,6	603,471	515,916
White	716,545	893,067	1,472,8	986,350	2,636,7	3,168,5	2,514,7	2,659,9	2,181,9	2,353,3
Hispanic					66,599	95,857	358,335	145,859	167,371	308,919

Figure 2: Southern migration to the north in the 20th century in the united states[29]

Certain policies led to increased migration, particularly the Bracero policy. This legislation was enacted in 1942, and allowed millions of Mexican men to work legally in the United States on short-term labor contracts.[30] This program carried on until the early 1960s, and set a precedent for migrant farm work in the United States. Furthermore, due to forced migration of Germans during World War II, immigration policy was expanded globally to welcome refugees from the war..

This mass migration had noteworthy economic effects, creating what is known as a 'labor supply shock'.[31] Such an influx of people in a short period of time makes compensation for that increase incredibly difficult. Jobs, wages, and wellbeing were limited due to lack of preparedness for these migrants, as well as due to wartime shortages in the supply chain.[32]

4. Equity and Justice in Climate Migration

The impacts of climate change are not felt equally across the population. Communities and individuals who are BIPOC+, experience low income, exist in food deserts already, the elderly, and those with preexisting health conditions are most vulnerable to climate change.[33] This also applies to the effects of climate migration. Who, when, and where people move will face great challenges in the realm of equity, as those most vulnerable will be the most likely to move.

4.1. Disproportionate Impacts of Climate Change

Vulnerability to climate change is determined by a community's ability to "anticipate, cope with, resist, and recover" from the impact of a shifting climate.[34] These vulnerabilities will be most felt by those already experiencing hardship, be that politically, socially, economically, or environmentally.

One of the major consequences of unchecked climate change will be extreme heat. People experiencing chronic medical conditions have an elevated death rate during heat waves, and low-income urban communities and BIPOC+ communities are especially vulnerable to increased frequency of heat waves and higher temperatures, due to the fact that they are often segregated in the inner city areas without central air conditioning or clean water access.[35]

Another expected characteristic of climate change is increased air pollution. One major barrier to safety and wellbeing for vulnerable populations in the face of air pollution is lack of access to basic necessities. Low-income communities spend the highest proportion of their income on basic necessities such as water, household energy (electricity), and food compared to high income communities.[36] One study found that Blacks, Hispanics, and people living in poverty are disproportionately located closer to major sources of air pollution, and live further from regulatory air quality monitoring sites compared to the overall population.[37] Without meaningful regulatory changes and policy shifts, this situation will only continue to worsen.

Flooding is yet another major issue when it comes to climate change impacts. Studies show that disadvantaged groups live in areas that are prone to flooding, partially due to lower property value rates and therefore lower rent or mortgage rates.[38] A large percentage of the populations living in low elevation coastal zones are rural; "84% in Africa, 80% in Asia, and 71% in Latin America".[39] It should be noted that rurality has a strong association with poverty.

4.2. Resource Distribution

Access to food, water, air, and soil is critical for a safe and healthy individual. Globally, demand for water will increase by 40% and for energy by 50% by 2030 as the population increases and temperatures rise.[40] Within the past 60 years, 40% of intrastate conflicts have been strongly linked to natural resources and competition over natural resources.

Of all illnesses in developing countries, 80% are attributed to unsafe drinking water and the spread of waterborne diseases.[41] Climate change will ravage the global water supply, and without access to proper water treatment facilities and desalination technology, developing countries will be hit hard by lack of access to clean water.

Food systems consist of food availability (production, distribution and exchange), food access (affordability, allocation and preference) and food utilization (nutritional and societal values and safety).[42] Food crises and shortages also contribute to a rise in displacement, fueling the global refugee and migrant crisis. Achieving food security becomes increasingly difficult when faced with lack of nitrogen nutrient cycling, water access, and changing land cover.

The threat of resource scarcity is a driving factor of migration. As people feel constrained in their access to resources, they may move in search of a better quality of life and more accessibility.

5. Climate Resilience and Adaptation

Climate resilience and adaptation are key components to preparing for the upcoming global shifts due to climate change. They can provide frameworks, strategies, and networks for climate action that not only work to mitigate climate change, but also increase sustainability and wellbeing of a community. Climate resilience and adaptation are carried out on many levels, from mutual aid work to global organizations like the United Nations. In order for resilience work to be effective, it must be equitable, diverse, imaginative, and guided by science.

According to the United Nations, adaptation is "adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli".[43] Adaptive actions can provide benefits and decrease impact to communities. Climate change adaptation actions also often fulfill other societal goals, such as sustainable development, disaster risk reduction, and improvements in quality of life. This allows adaptation to fit easily into existing planning processes. In the case of climate migration, adaptation can mean adjusting current migration and refugee policies to welcome and care for people in need. It can also mean reflecting upon past methods and reactions to migration, and creating new policies that advocate for and protect migrants. Some view climate migration as an adaptive strategy in and of itself, because movement in the face of a crisis (particularly when done preemptively), can be a crucial strategy to survival. Internal and international migration can help build adaptive capacity to future environmental and climatic hazards. According to the New Economics of Labor Migration theory, migration can be seen as a strategy to minimize risk, reduce consumption and diversify income.[44]

Climate resilience is the capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a climate-related disruption.[45] Figure 3 represents the difference between a resilient community and a non-resilient community, with the time required for recovery and the adaptive capacity of a community as the key elements.[46] The 'tipping point' refers to the point at which a community cannot recover or rebuild. A resilient community may have climate change adaptation features like mangrove forests, retention walls, regional food sources, or renewable energy infrastructure. A non-resilient community may lack infrastructure like well-built roads and shelters, have minimal access to public health resources, or be a socially vulnerable community. The purpose of this figure is for communities and planners to understand the inevitability of a hazard (particularly climate hazards), and respond in the most efficient way to avoid permanent losses. The acute hazard is not necessarily devastating, if partnered with investments for building resilience. There are alternatives to permanent damage from climate change, but actually implementing those climate adaptation and mitigation alternatives requires substantial planning efforts that meaningfully include community partners and a diverse planning team.

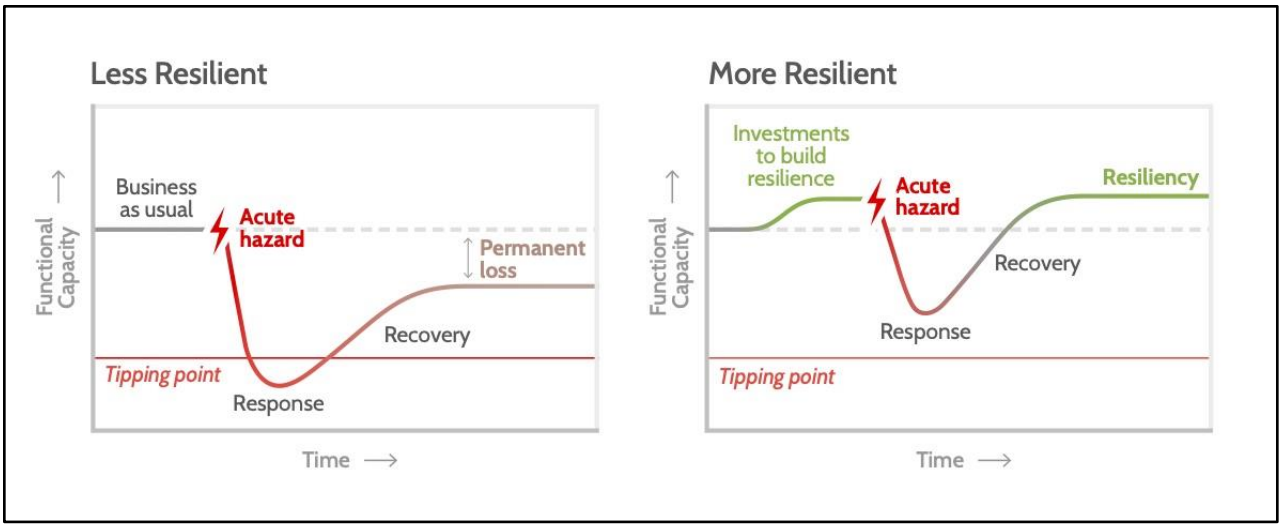


Figure 3: Differing community resilience to climate change at a glance[47]

Preparing for climate refugees means expanding adaptive capacity in a way that is equitable and pragmatic, and prioritizing resilience over short-term wins. This can take the form of investing in infrastructure, equitably distributing resources like food and water, and/or building green infrastructure to protect vulnerable communities from the worst of climate change. The National Oceanic and Atmospheric Administration (NOAA) and the National Environmental Modeling and Analysis Center (NEMAC) have partnered to create the Steps to Resilience model, explained in Figure 4. These steps are meant to inform practitioners and communities on how to best prepare for climate change, while prioritizing resources and time for those who will be hit the hardest.

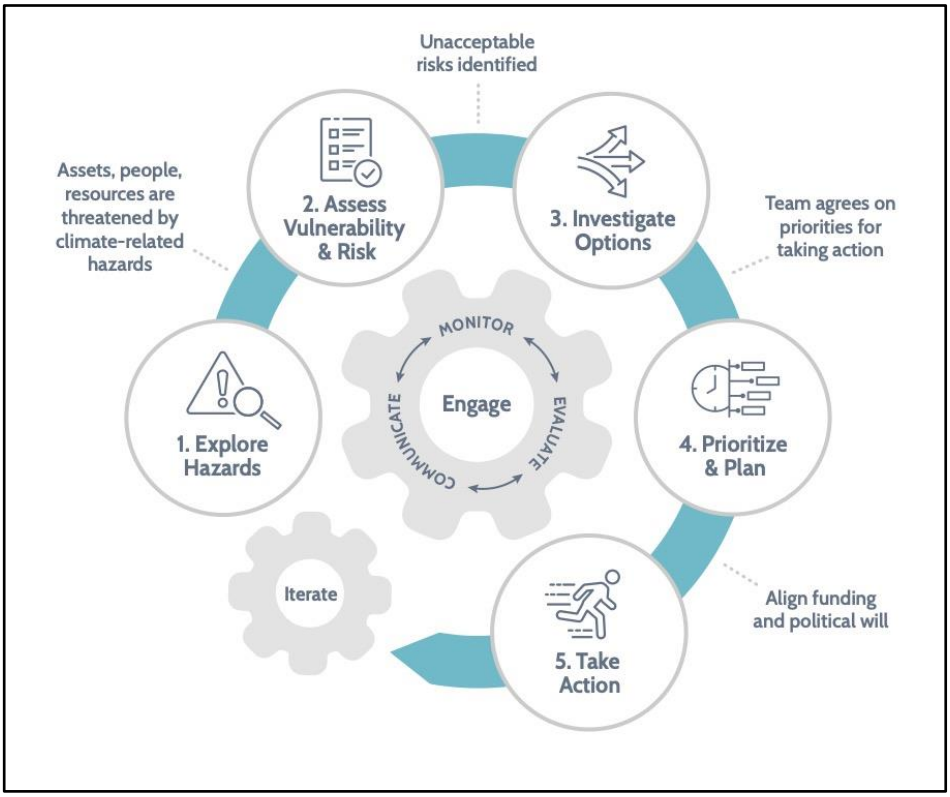


Figure 4: Steps to resilience[48]

The process begins with Step 1, exploring hazards, which aims to consider the things a community cares about and determine who and what is exposed to harm from weather and climate-related hazards.[49] Step 2 is assessing vulnerability and risk. Many communities are expected to assess vulnerability and risk with the purpose of understanding future complications, but within the climate resilience framework this process is meant to explore risk and vulnerability to *climate-related events.* This process aims to consider the sensitivity and adaptive capacity of your exposed assets to determine which ones are most vulnerable.[50] Many professionals carry out this process, such as NEMAC based at UNC Asheville. Other communities conduct an internal vulnerability and risk assessment that is carried out by community members. Step 3 is when communities begin considering possible solutions for their highest risks, such as the planting of mangrove forests or investing in failing infrastructure projects.[51] Step 4 is prioritization and planning, during which communities evaluate costs, benefits, and their capacity to implement the solutions identified in Step 3.[52] The last step is taking action, which means securing funding for the projects chosen in Step 4, and implementing them using the prioritization process completed previously.

6. Climate Migration Case Studies

6.1. Bangladesh

Bangladesh is a country in South Asia, and is home to 163 million people.[53] Its economy relies upon natural gas, arable land, timber, and coal, as well as textiles production and agriculture.[54] In Bangladesh, 39.7% of the population is located in urban areas, and only about 78% of the population has access to clean drinking water. It is a country that has high rates of poverty and food insecurity and will be one of the worst hit by climate change. Bangladesh currently faces many environmental challenges, including large areas of flood-prone land, waterborne diseases prevalent in surface water, water pollution, groundwater contaminated by arsenic, intermittent water shortages because of falling water tables, soil degradation and erosion, deforestation, and severe overpopulation.[55]

Climate stresses including water shortages, cyclones, floods and coastal/delta erosion are expected to affect livelihoods and safety of the Bangladeshi people in upcoming years.[56] This will cause many people to flee the flood-prone areas they have lived in for years, likely moving to more urban areas, creating resource scarcity and health risks. People have already begun to migrate within and beyond the country's borders. Agriculture's share in the GDP fell from 32% to 19% between 1980 and 2010, and industry grew from 21% to 28%.[57] This has led to rapid urbanization, and troubling policies that do not allocate resources for these new residents.

This climate-induced migration already has shown cracks in the foundation of Bangladesh's fundamental resource distribution tactics. For example, in June of 2021, 15-year-old Tarek Zia left coastal Bangladesh to work at a food-processing factory in the capital city, Dhaka.[58] The farmland he was raised on had been destroyed by river erosion and an ever-encroaching shoreline, and he was searching for new financial opportunities.[59] However, the factory Zia worked at had been erected without permission and lacked adequate safety measures, such as emergency fire exits. On July 8, 2021, the factory erupted in flames, killing Zia and many of his fellow workers. This case is not a one-off, but rather a proxy story that represents the challenges that under-resourced communities face. Without proper planning, foresight, and caution, tragedies will inevitably occur, disrupting not only the home nation's economy, but their health and wellbeing rates as well.

What can be learned from Bangladesh is the certainty of migration, as well as the great need for better policy and advocacy work. If people are moving as a climate adaptation strategy, it is necessary to accommodate them properly and thoroughly.

6.2. Pacific Islands

The Pacific Islands region is expected to be, and is already experiencing, the effects of climate change. For example, in Nauru, 74% of households have experienced one or more impacts of environmental change in the last decade. The availability and quality of water is the most severe environmental stress affecting the island, as drought and irregular rains have already impacted 61% of families surveyed in early 2015.[60]

All low-lying countries, such as Tuvalu and Kiribati, are particularly vulnerable to rising sea levels and increasing temperatures. While many refugees, particularly climate refugees, can move toward higher ground within their own country (deemed 'internally displaced refugees'), people in island nations will likely lose their homes completely due to sea level rise. Therefore, without an international solution, entire cultures, communities, and histories could be lost to climate change as people flee from natural disasters and sinking land. Already facing issues such as overpopulation, unemployment, high pollution, poor sanitation, and low-lying lands, with the average height of land in each country being less than two meters above sea level, islands like Kiribati, Tuvalu, and the Maldives struggle with staying afloat, both literally and figuratively.[61]

In Kiribati, former president Anote Tong made public pleas in 2009 to the international community for relief, recognizing that the displacement of the country's roughly 100,000 residents is effectively inevitable.[62] Furthermore, Tuvalu's government has considered a lawsuit against Australia and the United States for their contribution to climate change.

Certain nations, such as Australia, New Zealand, and the United States, are major contributors to climate change. Excluding the United States, they also happen to be in relatively close proximity to the island nations to which they are turning a blind eye in the face of mass dislocation. These nations must be held accountable for their continued impact on the planet, as well as be responsible for managing the damage that results from their behavior. In particular, the United States and Australia should be leaders in providing protections to sinking nations as they are two of the

largest contributors to greenhouse emissions in the world.[63] Figure 5 represents the contributions of various nations from different sources, and shows who the greatest contributors are to the ongoing climate crisis.[64]

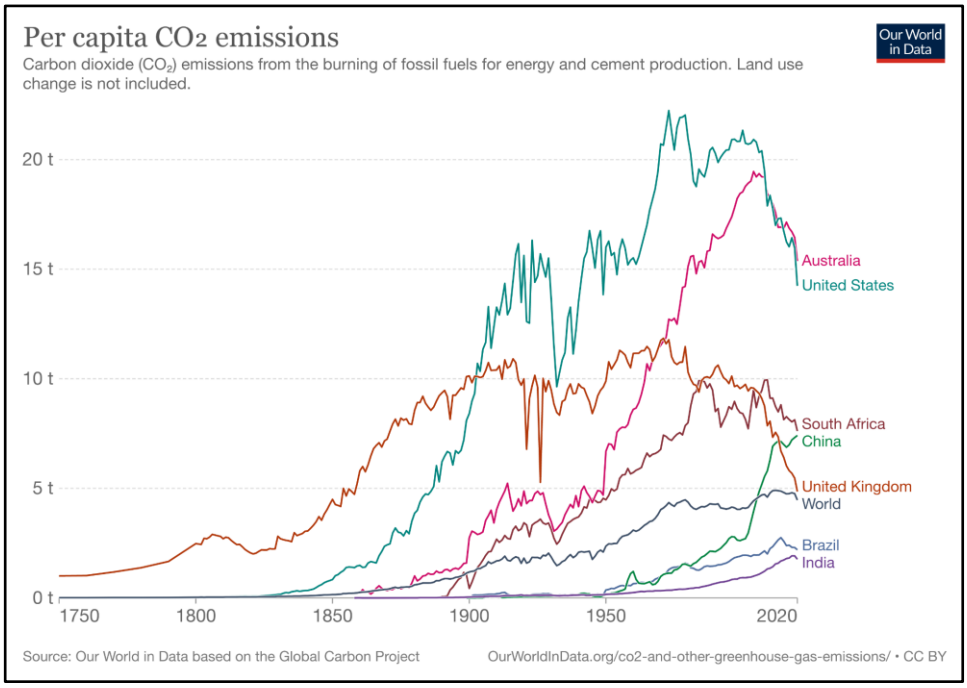


Figure 5: Per capita CO2 emissions by country from 1750 to 2020[65]

Recently, Australia and New Zealand have faced legal battles as a result of limited policy surrounding acceptance of refugees impacted by climate change.[66] Furthermore, New Zealand famously rejected an asylum seeker from Kiribati in September of 2015, who argued that sea level rise prevented him from returning home, on the basis that his claims did not meet the legal refugee criteria defined by the 1951 Refugee Convention.[67]

Some programs are in place that provide assistance and training to people from nearby island nations, such as New Zealand's labor migration scheme to the Pacific island nations of Fiji, Tonga, Tuvalu, and Kiribati through the Pacific Access Category (PAC). The PAC offers resettlement opportunities in New Zealand, however its annual cap of just 250 people each from Fiji and Tonga and 75 each from Tuvalu and Kiribati limits the power of the program.[68] Australia offers short-term working visas, through the Pacific Seasonal Workers Program, to workers from ten island nations, yet provides no permanent resettlement opportunity.[69]

Unlike New Zealand and Australia, the United States offers people who have been displaced by environmental factors or natural disasters to be considered for Temporary Protective Status (TPS). The legal qualifications for TPS are "conditions in a foreign country temporarily prevent its nationals from returning safely, or in certain circumstances, where the country is unable to handle the return of its nationals adequately".[70] TPS does not address migrants who face long-term climatic changes, and provides no course of action for permanent resettlement.

The ability to move, despite current and upcoming environmental disasters, is not a luxury all can afford. Over a third of Nauruan households believe that migration will be necessary in the future due to climate change.[71] However, only a quarter of households believe that they would be able to afford to migrate in the future.[72] Similarly, while 97% of surveyed households in Tuvalu reported they had been impacted by natural hazards between 2005 and 2015, only 53% of the people perceived they would be able to afford migration in the future.[73] This awareness of potential climate migration without capacity to respond represents a gap in policy and resource distribution. People see the urgency of the situation, but are not given the capacity to follow through on preparation.

6.3. Asheville as a Climate Migration Destination

Asheville is located in the Blue Ridge Mountains at the connection of the Swannanoa and French Broad rivers in Buncombe County, North Carolina. In 2021, it was home to over 90,000 residents.[74] Asheville is a popular destination for tourists during all seasons, but particularly during their mild summer and fall seasons. Tourism made up 14% of

the regional economy in 2021, and the cost of living is higher than the national average.[75] This discrepancy means that people who live in Asheville are often underserved in favor of the tourist population.[76]

For decades, people have been moving to Asheville for its ideal climate, reliable seasonality, and access to fresh water. In the face of climate migration, it is very likely that Asheville will see an influx in its population as people search for favorable living conditions. Already, Asheville is experiencing a population boom, with Buncombe County's population rising more than 10% between 2010 and 2019.[77]

Asheville provides literal and metaphorical 'higher ground' for those in nearby states facing climate-related issues. Hurricanes in Louisiana and Texas, flooding and sea level rise in Florida, and extreme storms in the North are all reasons for migration to somewhere mountainous like Asheville. Furthermore, property insurance rates are relatively lower in Asheville than places like Florida due to its minimal expected climate change effects. Asheville has also committed to meaningful resilience efforts, and houses nationwide climate data and research centers, making the city more desirable in the long term.

7. Conclusion and Recommendations

7.1. Recommendations for Addressing Climate Migration

There are many policy advancements that can be made to protect and advocate for climate migrants and refugees. As seen in places like Asheville and Bangladesh, the effects of climate migration are already happening. It is necessary to make rapid adjustments to government structures and policies that favor the needs of the most vulnerable. There are three main arenas in which action can help protect climate refugees and migrants: greenhouse gas emissions reductions; financial and technical assistance to underserved communities and nations; and adaptation help in developing countries.[78]

Greenhouse gas emissions reduction is the best way to mitigate climate change. This can be done while prioritizing equity by investing in a Just Transition to renewable energy, which means transitioning to a zero carbon future that ensures that people who currently depend on fossil fuel-intensive activities receive the support, social protection, and investments they need to thrive.[79] A Just Transition could renew global systems of justice and equity through mutual aid and community development. Divesting from fossil fuels and investing in communities is the way toward fewer climate change impacts, and higher rates of wellbeing on a global scale. This will also help reduce the need for migration and the consequences of displacement, making climate migration a less prominent issue among nations and communities.

Furthermore, Indigenous knowledge and ways of knowing are a powerful mechanism of preparing and adapting to climate change. While climate change threatens the culture, sovereignty, health, economies, and livelihoods of Indigenous people, they are also leaders in conservation and sustainability. A Just Transition must include concepts of Traditional Ecological Knowledge (TEK), tribal sovereignty, and community-oriented action.[80] These concepts come in many forms. Approaches such as prioritizing cooperation and community between humanity and nature, and recognizing their inherent intertwined relationship, can help push forward mechanisms of resilience.[81] Additionally, climate resilience efforts that are rooted in a sense of place are more sustainable and culturally relevant to their respective regions.[82]

A 2014 IPCC report noted that, "Indigenous local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adaptation efforts".[83] The Indigenous Environmental Network has set forth a list of principles for a Just Transition, including the preservation and revitalization of Indigenous languages, deferring to Indigenous leadership, and the prioritization of food sovereignty.[84] Traditional Ecological Knowledge is a critical component of a Just Transition and addressing climate change; TEK at its core is the evolving knowledge acquired by Indigenous and local peoples over hundreds of years through direct contact with the environment.[85] Practices of TEK can include using Indigenous language and signage for landmark and plant recognition and use, protection of native species, intergenerational transmission of knowledge, or embedding folklore and storytelling in conservation practices.[86]

Financial and technical assistance are also critical to addressing climate migration. There are a wide range of financial and technical assistance policies that can be enacted, including tax policy changes, expanding and creating state and federal grants, government bonds which enable communities to borrow money to pay for projects, and public-private partnerships that provide financial and technical expertise to a community.[87]

Providing adaptation help to developing countries is a critical step toward addressing climate migration. While migration itself is an adaptive strategy, there are alternatives that may prevent the need to move. These include

strategies such as protecting and restoring natural ecosystems (particularly mangroves, forests, and oceans), early warning systems for extreme weather events and climatic shifts, infrastructure investment, and securing water access during and outside of extreme heat and weather. These may all help a community survive and thrive after a major climate change event, as well as chronic climate change events, lessening the need for relocation.

There are many ways to address this issue while considering equity, cultural differences, and legal practicalities. The first step is recognizing climate refugees as an independent group of displaced individuals. Without a legal framework, it is incredibly difficult to make policy and provide aid to nations facing the worst of climate change. Next, international leaders must mitigate the impact of climate change on these countries, prolonging a thriving community while providing a pathway for immigration. This method of addressing climate refugees has the benefit of allowing time for training, adaptation, and stabilization.

The United Nations may be the best organization to begin the movement toward protecting climate refugees. At the 26th UN Climate Change Conference of the Parties (COP26), the United Nations High Commissioner of Refugees (UNHCR) claimed to support a collaboration of nations in securing a global net zero carbon emissions rate, mobilizing finance and adapting to protect communities and natural habitats.[88] UNHCR urged parties to combat the growing and disproportionate impacts of the climate emergency on vulnerable countries, particularly those facing mass displacement.[89] Furthermore, it urged all parties to support vulnerable countries in their efforts to rapidly scale up prevention and preparedness measures to avert, minimize and address displacement.[90]

The need for support for climate refugees is evident and growing, and some agencies and policies of the United Nations are beginning to address the issue. The Global Compact on Refugees, affirmed by an overwhelming majority in the UN General Assembly in December 2018, recognizes that "climate, environmental degradation and disasters increasingly interact with the drivers of refugee movements".[91] The Global Compact on Refugees has three main areas of climate action: law and policy; engagement within island and vulnerable nations; and decreasing its environmental footprint.

Social entrepreneurship is another powerful method of addressing the impending climate refugee crisis. Generating climate resilience through social enterprises creates a pathway toward survival while also contributing to the global economy. Social enterprises are organizations that apply economic strategies to maximize improvements in financial, social and environmental well-being. For example, Grameen Bank is a microfinance and community development bank founded in Bangladesh, and aims to extend banking facilities to poor men and women and eliminate the exploitation of the poor by money lenders.[92] The organization has a stated commitment to combat and adapt to climate change, while prioritizing microfinancing and social entrepreneurship in the process. It brings together the concepts of equity and resilience in an incredibly powerful way, empowering communities to both prepare for and react to climate shifts.

There are many ways in which this economy-based approach can address climate refugees with equitable principles and community-based solutions, such as local water treatment that increases access to safe water and provides livelihoods to local entrepreneurs. Nations like the United States could potentially provide the training and infrastructure for this process, and also benefit from the economic gains. Another aspect of social entrepreneurship that can be successfully implemented to address climate refugees is the protection of professional networks, such as a network of local women selling solar energy and lighting systems to their neighbors, like the Solar Sisters in East Africa.[93] These types of networks empower community members both economically and socially, all while addressing the climate emergency.

The Green New Deal in the United States provides a forward-thinking framework for opportunities that maximize social, economic, and environmental benefits. The goal of the Green New Deal is an equitable transition to 100% clean energy, which does not include natural gas, biomass, nuclear power, or oxymoronic "clean coal".[94] The program allows for the United States military budget to be halved, as installations around the world that protect fossil fuel infrastructure will no longer need to exist.[95] Furthermore, it puts into place policies that make the largest offenders pay for their effect on climate change, and that money goes directly back into job creation and community development. The three main avenues of change are the following: investment into green business with grants and loans; prioritization of green energy research; and the Full Employment Program, which will directly provide millions of jobs in sustainable energy and energy-efficiency retrofitting, mass transit and "complete streets" that promote safe bike and pedestrian traffic, regional food systems based on sustainable organic agriculture and clean manufacturing.[96]

In the United States, the federal government has remarkable power over the future of climate migration. Actions like expanding Temporary Protected Status to both include climate migrants and create a path to citizenship, creating migration policy that prevents deportation to non-resilient and underserved disaster zones, or signing the Global Compact for Migration (a nonbinding international agreement on migration that directly recognizes climate change as a structural factor), are all options for climate action that can be carried out immediately and without needing to go through legislative bodies.

Enacting direct and explicit policy on climate migration and climate refugees is the first step towards addressing the issue at large. There needs to be a clear, international, legal definition of climate migrants and refugees. Some places are already putting forth initiatives to prepare for the influx of climate migrants, such as in Australia where the government has been advised to create a new visa category to allow Pacific Islanders to relocate permanently in order to mitigate the impact of climate change.[97]

7.2. Implications of Climate Migration

As people flee areas both preemptively and reactionarily, climate migration becomes a larger issue on a local and global scale. In doing this research, it has become incredibly clear that immediate action on climate change and climate migration is not only the best option for the natural environment, but also can be beneficial to the already existing socio-economic problems that exist in today's global economy. Furthermore, the breadth and depth of this action must be widespread and diverse, ranging from local action to international and global action. Lastly, these actions must be primarily focused on equity and resilience, using problem solving and scientific data to drive decision making.

Climate migration is here, and it will only continue to ravage communities, tear apart families, and alter the makeup of major cities and communities. It is inevitable that climate migration will grow as the effects of climate change become more prominent, and it is necessary that local, regional, and global leaders take intentional action to combat the negative consequences of climate migration.

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