

Central American Migrants and their Perceptions and Lived Experiences with Environmental Change

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ABSTRACT

Environmental migration is not a new phenomenon—people have moved to new regions in search for a new supply of resources and protection for millennia. However, as the scale of environmental catastrophe rapidly increases with the earth’s changing environment, the amount of regions and communities impacted is growing, oftentimes forcing relocation of the most vulnerable. In the last three years, hundreds of thousands of Central Americans have migrated across borders as a response to gang violence, poverty, corruption, and environmental degradation. While existing research has explored the socioeconomic and political push factors of migration, my study aims to explore Central American migrant narratives regarding the environment. Utilizing a semi-structured approach, I conducted interviews with Northern Triangle migrants staying at shelters across Mexico with the goal of understanding their environmental perceptions and experiences in their countries of origin. Narrative analysis of the interviews demonstrated the existence of a strong environmental ethic among all participants, and the awareness of the role human development has played in causing environmental changes in the region. Deforestation, water scarcity, and public health were the top environmental concerns listed by participants, and the majority perceived the environment as a factor in their decision to migrate. As environmental change progresses in Central America, environmental perceptions and experiences among its most vulnerable inhabitants needs to be assessed and interpreted to help shape community efforts, public policy, and international law regarding environmental mitigation and adaptation for survival.

KEYWORDS

Migration, environmental degradation, climate change, displacement, Northern Triangle

INTRODUCTION

Although environmental change is not a new concept or process, the range, scale, and effects of the current changes taking place are contributing to a global environmental crisis (O'Neill 2017). Despite international efforts to address environmental problems, societies across the globe are experiencing the ecological, economic, and social impacts of anthropogenic environmental change on an unprecedented level (O'Neill 2017; IPCC 2014). Environmental changes such as climate change, global warming, habitat destruction, biodiversity loss, and desertification, among others, are pushing human societies towards collapse as ecosystem integrity degrades and resources deteriorate (IPCC 2014; Adelman 2018). The anthropogenic sources of these changes, such as land-use management, carbon emissions, and resource extraction, unavoidably demonstrate the historic and present roles human development, capitalism, and globalization have had in the creation and progression of ecological destabilization (Faber 1992; Adelman 2018). The harms and risks brought about by such processes are further exacerbated by the social and economic inequalities pervasive within different nation-states, societies, and communities (Mendez et al. 2020; Levy and Patz 2015).

One of the more vulnerable regions of the world to environmental degradation and change is Central America. Stemming from a history of extractive colonialism, and further fueled by Western-implemented development schemas in the mid-twentieth century, decades of resource exploitation, rampant deforestation, and pollution continue to threaten Central America's ecosystems and communities (Faber 1992; Wallman et al. 2018). Land use changes for agriculture, animal husbandry, and mining have led to soil degradation, wildlife habitat destruction, and air and water pollution (ECLAC 2018; Lennox 2013; Hidalgo and Alfaro 2012). Furthermore, the region has one of the highest deforestation rates on a global scale, mainly due to logging, palm oil plantations, and livestock agriculture (WCS 2017; Devine et al. 2021). This acute deforestation coupled with climate change impacts, such as increases in droughts, heat, and frequency of natural disasters, further stress the region ecologically and socioeconomically (Aguilar et al. 2009; Lennox 2013), as communities face water shortages, food insecurity, crop failure, and loss of livelihoods (Lennox 2013). These environmental changes, along with socioeconomic instability and political corruption, ultimately all work in conjunction to induce cross-border migration of Central Americans (UNHCR 2020).

In the last three years, hundreds of thousands of Central Americans have migrated to Mexico—either as a final destination for resettlement or as a part of their transit to the United States (Human Rights First 2020). The majority of these migrants are arriving from the Northern Triangle countries of Guatemala, Honduras, and El Salvador (CRS 2019), a sub-region particularly afflicted by gang violence, gender-based persecution, and economic instability (Cheatman 2019). Although not all of the ongoing migration can be exclusively categorized as environmental displacement, the consistent environmental changes and degradation in this sub-region are increasingly important factors to address as they further burden vulnerable populations (Warner and Afifi 2014; UNHCR 2020). Additionally, stringent developments in U.S. and Mexico immigration law are creating extraordinary barriers for displaced individuals and families seeking safety northbound of their countries of origin (White 2009). As the environmental crisis expands in the Northern Triangle, as it is projected to do so (IPCC 2014), further stress will be put on the economic, political, and public health sectors of the region, exacerbating displacement and increasing the amount of families and individuals forced to confront immigration systems that offer virtually no legal recourse for safety (White 2009).

Although immigration law reform is necessary, implementing environmental mitigation and adaptation policies is an essential part of curbing Central American displacement (Lennox 2013; UNHCR 2020). Assessing the particular situations and limitations the most vulnerable communities in the region face is essential in order to develop the best avenues of support (Lennox 2013). Although existing research has analyzed the socioeconomic and political push factors of migration, my study explores Northern Triangle migrant narratives regarding the environment. I specifically wanted to know how individuals perceived and interacted with, via awareness, conscientiousness, and practices, environmental degradation in their country of origin. Furthermore, I aimed to understand the type of environmental situations and stressors encountered, and if those experiences had ultimately factored into each migrant's decision to migrate.

Main environmental stressors and impacts

Climate change

Although there are many ecological factors contributing to the environmental crisis in the Northern Triangle, climate change, deforestation, and natural disasters are main environmental stressors impacting the region (Hidalgo and Alfaro 2012; Lennox 2013; IPCC 2014). Central America's hydro-climatic variability and topographical location subject the entire region to large-scale ocean-atmospheric interactions such as El Niño and La Niña, heightening the region's vulnerability to climate change impacts (Aguilar et al. 2009; IPCC 2014). This vulnerability has resulted in overall increasing temperatures and decreasing precipitation trends across Central America, exacerbating the frequency and severity of droughts, heat waves, and desertification (IPCC 2014)—impacts that are particularly affecting agricultural production and livelihoods. In 2018 alone, Guatemalan agricultural families lost about 115 thousand hectares of crops due to climate change (Aid and International Development Forum 2018)—a trend that extends all over Central America.

Additionally, over the last decade, climate change exposure and impacts contributed to tropical storm intensification, sea level rise, degradation of local ecosystems, biodiversity loss, landslides, and local flooding (Hidalgo and Alfaro 2012; IPCC 2014; ECLAC 2018). Furthermore, the Intergovernmental Panel on Climate Change currently projects significant increases in regional temperature (+1.7°C to +6.7°C) by the end of the 21st century (IPCC 2014). These climate change stressors ultimately unleash a cascade of secondary effects on the region, affecting public health and resource access, as impoverished communities struggle to adapt—a situation that will only exacerbate as climate change progresses (Hidalgo and Alfaro 2012; IPCC 2014).

Deforestation

The climate change situation in Central America is further compounded by pervasive deforestation for logging, intensive agriculture, and illicit activity (IPCC 2014; Devine et al. 2021). Enormous declines in forest area are prevalent across the region, impacting soil health,

humidity and water conservation, and biodiversity, as species face key habitat loss (IPCC 2014; WCS 2017). Specific to the Northern Triangle, over the last 20 year beginning in 2001, tree cover decreased 21 percent in Guatemala, 15 percent in Honduras, and 8 percent in El Salvador, as reported by the Global Forest Watch. Security infrastructure and corruption also play a role, as according to a study by the Wildlife Conservation Society (2017), the growing presence of illegal cattle ranching over the past 15 years has led to a 23 percent decrease in size of the three largest forest blocks in the region. Additionally, drug trafficking is further fueling deforestation, as natural protected areas (particularly in Honduras and Guatemala) are converted for airstrips, illegal resource extraction sites, or for money laundering purposes (Tellman et al. 2020; Devine et al. 2021). These land-use changes are enhancing heat, soil aridness, and water scarcity, particularly impacting small-scale farm holders and rural inhabitants in the region (IPCC 2014; Imbach et al. 2017).

Natural disasters

Topography historically has played a role in Central America's propensity for natural disasters, and responsiveness to climate change has increased the frequency and severity of extreme events (IPCC 2014; Hidalgo and Alfaro 2012). Since the 1970s, the number of natural disasters (particularly hurricanes and storms) in the region has increased by 6 percent annually (ECLAC 2018). Evidence demonstrating anthropogenic influence, via climate change and ocean warming, in these increasing trends is accumulating (IPCC 2014; ECLAC 2018), strengthening environmental justice implications for the impacts experienced by Central America's communities. In November 2020, category 4 hurricanes, Eta and Iota, descended in the north, impacting an estimated 7.3 million Central Americans (GEOGLAM 2020). These events particularly affected Honduras and Guatemala, as intensive flooding, crop destruction, and infrastructure damage culminated with hundreds of fatalities and widespread displacement (GEOGLAM 2020). Almost 100 thousand Hondurans were forced to seek refuge in shelters, as entire towns and homes were washed away (OCHA 2020). Although the Eta and Iota hurricanes were enormous environmental forces, the underlying factors for their devastating impact stem from the socioeconomic context of the region (GEOGLAM 2020).

Socioeconomic factors enhancing vulnerability in the Northern Triangle

The socioeconomic and political instability present in the Northern Triangle countries enhances the severity and range of environmental change impacts (IPCC 2014; Hidalgo and Alfaro 2012). The current institutions, economic sectors, and demographics of Guatemala, El Salvador, and Honduras, set-up the stage for heightened vulnerability and exposure to climate change and environmental degradation impacts (CRS 2019; IPCC 2014; Cheatman 2019). Although the last couple of decades have shown some economic and social improvement in the region, these countries are still undermined by poverty, violence, corruption, and instability (CRS 2019; UNHCR 2020). Poverty rates are high in all three countries (CRS 2019), brought about by unstable economies, low productivity, and a lack of social infrastructure (CRS 2019). This economic situation then leaves families and communities with limited resources and pathways for mitigating the harmful impacts of environmental change, especially in regards to relieving crop failure, natural disaster damages, and resource scarcity.

Vulnerability is additionally exacerbated by pervasive gang presence and gender-based violence in the region (CRS 2019). As most Northern Triangle households are of low socioeconomic means, they are extremely exposed to crime, extortion, and/or forced gang recruitment, with no effective legal avenues for justice (CRS 2019). Furthermore, drug production and trafficking, along with governmental corruption, are impacting the region environmentally (as discussed above), and socially, fueling conflict, oppression, and displacement (Tellman et al. 2020). Corruption and lack of national capital are further obstacles for implementing effective environmental policies or programs, such as warning systems and emergency responses for natural disaster preparedness (CRS 2019; IPCC 2014). Violence against environmentalists is also rampant in Central America, as indigenous leaders, ecologists, and outspoken activists are increasingly victims of assault and homicide (Scheidel et al. 2020; Cheatham 2019). The unwillingness and inability of the governmental sectors to address these issues and increase adaptive capacity for environmental change then leaves already impoverished communities to fend for themselves. Because the climatic, ecological, and public health impacts of environmental change are projected to further increase in range and severity (Lennox 2013; IPCC 2014), it is essential for Central American communities and countries to develop and implement policies and practices for fostering environmental awareness and knowledge.

Educational obstacles to environmental awareness

Current government initiatives are insufficient, or nonexistent, in managing environmental change, pushing the responsibility for mitigation and adaptation onto communities and individuals (Lennox 2013). Education plays a pivotal role here, as ecological, agricultural, and climatic knowledge can inform community decisions regarding resource scarcity, agricultural practices, and natural disaster preparedness (de Sousa et al. 2018; IPCC 2014). Although traditional and local knowledge systems present in Central America actively contribute to environmental perceptions and awareness, low educational backgrounds and standards hinder household awareness and decision-making in the region (de Sousa et al. 2018; Iwama et al. 2021). Specifically in the case of the Northern Triangle countries, efforts to improve environmental education and awareness would have to be developed in tandem with initiatives to bolster general education attendance rates and standards.

The educational component of the Northern Triangle countries is parallel to the region's political and socioeconomic situations, where school enrollment and quality of education are low compared to most Global North countries (UNESCO 2017). Poverty is an enormous obstacle to education, as children and adolescents are forced to leave academic pursuits to find work and help their families meet economic demands. In the case of Guatemala, the intersecting backdrop of poverty, violence, and racism against indigenous peoples hinders efforts to implement and improve education (Galicía 2016). Similar problems manifest in El Salvador, where gang violence and general instability make up a strong deterrent to education. In 2018 alone, such circumstances in El Salvador led to 49,000 children and adolescents dropping out of school (UNHCR 2020), a situation that has only been exacerbated by the recent COVID-19 pandemic and hurricanes Eta and Iota. Low school attendance rates are present in Honduras and Guatemala as well, with over 2 million children out of school (UNHCR 2020). Furthermore, the educational infrastructure in all three countries is burdened by a lack of resources and funding, resulting in substandard quality of education (Galicía 2016).

The current state of education in the Northern Triangle connects to the broader conversation regarding climate change mitigation and long-term adaptation. An educated public is necessary to effectuate resource sustainability, implement climate disaster safeguards, and increase resiliency for future environmental change (Iwama et al. 2020; de Sousa et al. 2018).

Furthermore, as climate change continues to threaten agriculture in the region, education increases the implementation of safer farming practices to avoid crop failure among independent farmers (de Sousa et al. 2018). As most residents of Guatemala, El Salvador, and Honduras work in the agricultural sector (Imbach et al. 2017), bolstering environmental and non-environmental education is a vital response to environmental change, and important factors in defining knowledge and value systems, perceptions, and lived experiences in the region.

METHODS

Semi-structured interviews

To discern the relationship between the environment and migrants from the Northern Triangle, I first reached out to different migrant shelters across Mexico with the goal of finding voluntary migrants to interview. I specifically chose shelters in Mexico for the high quantity of Central American migrants currently present in the country, as they either make their way further north to the United States or choose to resettle there. Within the three shelters I chose to work with, I conducted on-site semi-structured interviews with 25 migrants from Honduras, El Salvador, and Guatemala, following strict COVID-19 safety protocols. Further logistics regarding location and dates of the interviews conducted at each of the three shelters are listed in Table 1.

Table 1. Participating migrant shelters in Mexico.

Migrant shelter:	Location:	Migrants interviewed:	Dates interviewed:
Albergue Migrantes Toribio Romo	Santiago de Querétaro, QRO.	9	Feb. 20–March 5, 2021
Centro de Orientación del Migrante de Oaxaca	Oaxaca, OAX.	8	March 9–March 15, 2021
Uno de Siete Migrando	Chihuahua, CHIH.	8	March 17–March 21, 2021

In the span of a month, I visited the listed shelters and presented the topic and goals of my research to the current migrants staying in each one. Based upon interest and willingness, the migrants themselves volunteered to be interviewed for approximately 30 minutes, and were compensated with \$200 MX (\$10 USD) for their time and participation.

With their verbal consent, 24 of the participants allowed me to audio record their responses, and all of the interviews were conducted in Spanish (the native language of all of the participants). I used a set of fundamental questions (Table 2) as starting points, and utilized a semi-structured approach given the diversity of backgrounds, perceptions, and experiences of each individual. This approach allowed me to delve into different subjects during the interviews, depending on the responses I was receiving, and ultimately led me to collect a wide range of personal narratives all unified by their environmental focus.

Table 2. Foundational questions utilized in the semi-structured interviews.

Questions
1. What is the environment to you and do you think it is important?
2. What did you and/or your community do to protect the environment and its resources?
3. What sort of environmental changes did you encounter? And what did you do to combat these changes?
4. If you worked in agriculture, was your work experience ever negatively impacted by an environmental factor?
5. What sort of experiences with hurricanes, droughts, floods, water scarcity, and food insecurity have you had?
6. Are you aware of any governmental or non-profit programs for disaster relief, water and food insecurity, and/or general environmentalism?
7. Why did you decide to migrate from your country of origin?

Thematic coding

I specifically wanted to know how individuals perceived and interacted with, via awareness, conscientiousness, and practices, environmental degradation in their country of origin. Furthermore, I aimed to understand the type of environmental situations and stressors encountered, and if those experiences had ultimately factored into each migrant’s decision to migrate.

To protect the identities of those interviewed, I changed all of the names of the interviewees for my analysis. Once I completed the interview portion, I transcribed and translated all of the interviews, and then used thematic coding (Williams and Moser 2019) to categorize the data into both predefined and emerging domains of interest. I read each complete

transcription three times, each time solely focusing on highlighting the responses that would answer one of the research questions. Within each transcribed interview, I categorized the main blocks of information into three groups: perceptions, interactions, and experiences. I further analyzed these three sections, and then coded the selected parts for more specific themes and details.

To analyze data on migrant perceptions, I specifically focused on responses regarding individual awareness on the existence and of the harms of environmental changes. Perceived presence of environmental activism, resource dependence, and agricultural practices all emerged as dominant themes, as many of the migrants had interacted similarly with their environment in their country of origin. Environmental knowledge, regarding change or conservation strategies, and experiences with environmental stressors were predefined themes, aimed at exploring the relationships between vulnerability, degradation, and migration. Ultimately, the thematic coding I conducted led to seven main domains (Table 3).

Table 3. Domains for thematic coding.

1	Environmental ethic
2	Knowledge regarding environmental change
3	Awareness and presence of environmentalism
4	Resource access and dependence
5	Agricultural and environmental practices
6	Experiences with environmental change and stress
7	Migration

These domains were selected as they reflected the broad range of responses that I collected during my interviews and the diversity of perceptions and experiences within the group of migrants. By using this method of analysis, I was able to extract the narratives and perceptions relating to the nexus between migration and environment, applying each domain to answering one or more of my research questions, as there was overlap. To discern perceptions, as shaped by knowledge, awareness, and conscientiousness, regarding environmental change, I analyzed responses that fit into domains **1-5**, focusing on environmental value systems, education and knowledge, and awareness regarding current environmental stressors and change. To gauge experiences with environmental change, I looked for interview responses that fit domains **4, 5**,

and 6, particularly focusing on experiences of scarcity and stress as potential displacement push-factors. Lastly, in order to understand the environmental impact on migration decisions, answers that fit appropriately into domain 7.

All of these responses were further interpreted within the demographic contexts of each participant, in order to identify the synergistic effects and overlying factors influencing the experiences, perceptions, and decisions to migrate.

RESULTS

Demographics

Twenty-one of the participants identified as male and 15 had migrated from Honduras, making the largest two demographic groups as depicted by Table 4. While only four identified as female, this gender ratio should not be taken as indicative that women are migrating less, but as supporting evidence to the fact that women tend to go to women-only shelters when seeking temporary housing in transit. Furthermore, 88% of participants had worked in agriculture for at least two years, most growing beans, maize, and coffee in their countries of origin.

Table 4. Basic demographics of interview participants.

Gender	
Female	4
Male	21
Age Group	
11-20	5
21-30	13
31-40	4
41-50	3
Nationality	
Honduras	15
El Salvador	2
Guatemala	8
Agricultural work experience	
2 years or more	21
None	4

Although the majority of participants were from Honduras, there was diversity of in-country origins, as participants came from different towns, cities, and regions as depicted by Figure 1. There were only two existing overlaps—the five participants from Tegucigalpa, Honduras, and the two participants from San Pedro Sula, Honduras. These two cities encompass the largest urbanized regions in Honduras, and with the addition of a man from San Salvador, 8 participants made up the total residents from urbanized regions. The rest were from rural countryside towns—an important factor in the varying environmental exposure and experienced stressors of the group. However, even within the urbanized group, the majority of the participants reported moving frequently within their country of origin, returning to the countryside to work in agriculture depending on the season. Many migrants worked multiple jobs or shifted jobs with the seasons in their countries of origin, so it was very common for participants to mention working in agriculture only three or so months a year during a particular season such as during the planting or harvesting season, and then return to a different employment. The top work industries reported besides agriculture included carpentry, automobile care, and tourism.



Figure 1. Map of each participant’s origin. As many had moved multiple times around their countries, “origin” was defined as the region in which they spent the most amount of time during their residence. Tegucigalpa and San Pedro Sula, Honduras have overlapping points for multiple participants, hence why 25 separate markers are not visible.

The participant average and median age came out to be 27, although there were three unaccompanied minors under the age of 18 present. Level of education, as measured by years of

school completed, was low as only 20% of the group reported having completed a middle school education or higher. When asked why each person had been unable to continue attending school, economic insecurity was the most frequent reason reported.

Environmental Perceptions

Awareness of environmental processes and change

Although education rates were low, the majority of participants recalled learning about the environment to varying degrees in their elementary education. The subjects most frequently taught were recycling, pollution (particularly air and plastic pollution), and deforestation. The latter subject was extremely emphasized as key to combatting water scarcity and for essential climate control. Experiences in agricultural settings also contributed to awareness of environmental processes, as 88% of participants had worked in the fields at one point in their lives. Many participants noted how increasing temperatures and water scarcity impacted their livelihoods, via crop failure. Furthermore, participants that lived in rural areas and the countryside stressed their immediate dependence on the environment for water, food, and shelter. The experiences of urban participants, while still vulnerable to environmental change, differed in the ways these stressors presented themselves, and hence awareness of environmental change was still present among this demographic despite different experiences.

Although varying degrees of exposure, livelihoods, and regional locations of each participant ultimately influenced their perceptions of environmental changes occurring, 84% of participants perceived changes in climate, noting specifically how hot and dry their weather has become in comparison to how it was 10 years ago:

There used to be very pleasant weather in Tegucigalpa, about 15 degrees [Celsius] and yet because of the enormous amount of illegal logging that occurred, the weather is now extremely hot year-round, reaching about 24 degrees—and because there is no more forest, we feel the heat much more intensely. - Eduardo, Honduras

Lots of illegal deforestation is impacting the climate—it no longer rains in various parts of the country, and so large flowing rivers that once existed have shrunk into creeks. This

is impacting agriculture and employment, as crops cannot survive the heat. - Martin, Guatemala

With the exception of the only college graduate, none knew what climate change was in the formal scientific sense, and like Martin and Eduardo, most connected increasing temperatures with illegal logging, general deforestation, and corrupt governmental practices. Scientific processes behind all changes were largely unmentioned, although as was the case with increasing temperatures, other environmental changes were also attributed to anthropogenic causes, demonstrating participant awareness on the role human activities have had in shaping the current environment:

This is why we are wearing face masks right now, because lots of people—especially the millionaires and the governments—didn't care about all of the corporations that were contaminating the environment, they just want to produce more and more, but they don't care how they affect the public . . . and now we are dealing with the coronavirus. -Maria, Honduras

The soil is no longer healthy, too many crops die nowadays. This is happening because of the wildfires that frequently occur in El Salvador—for no reason, people just start these fires and it burns the land—then one can no longer grow anything there because the crops will fail. - Diego, El Salvador

Awareness on the existence of different environmental changes occurring varied depending on the participant's background, however the anthropogenic causation was frequently perceived and linked to governmental corruption.

Perceptions on aid and corruption

Perceptions on accessibility to aid for resource degradation and scarcity ranged little. The general consensus was that there existed no avenues of support for natural disaster relief, water and food scarcity help, or for agricultural support. Aid and support networks, belonging to either the non-profit or governmental sector, were perceived as minimally present, ineffective, and useless. Only 6 participants were able to identify existing organizations offering social support in their countries, while the other 19 participants were either completely unaware as to the

existence of such organizations or were minimally aware that those non-profits existed but couldn't recall the specific names or details. Interactions with non-profits were minimal, and the forms of support available as experienced by participants were mostly food donations and emergency rescue services during natural disasters. The dominant perception on aid from this particular sector was that it was ineffectual, and that if one was experiencing food insecurity, water scarcity, or some other stressor, the only viable channel of support was the community.

Two main narratives emerged regarding the role of the government in environmental change and mitigation. The first, and more dominant, narrative held the government to be an extremely corrupt entity that prioritizes profit and financial gain above public health and wellbeing. This perception was particularly prevalent in the context of post-hurricane relief and in the source of recent violence against environmentalists:

The hurricanes [Eta and Iota] destroyed the economy, and the entire country was left without a job, and aid that was supposedly going to arrive from other countries never came . . . the current government is very corrupt—they didn't give us any support when the coronavirus hit, and neither when the hurricanes arrived. - Gabriel, Honduras

In the last two years, several activists trying to protect the environment were murdered. Organized crime was trying to get rid of these individuals so that the government could sell the land to foreigners who wanted to build cities and destroy the forest. - Eduardo, Honduras

All participants from Honduras specifically referenced their experience with the 2020 hurricanes of Eta and Iota, mentioning the complete absence of necessary evacuation protocols before the storms, and the lack of governmental assistance afterwards. One participant from San Pedro Sula only received support from his local church, recalling how the church leaders utilized the building as a shelter for people who had lost their homes to the intense flooding. However, in contrast to this dominant narrative, municipal policies were regarded as the number one deterrence against illegal logging. Participants spoke of the fines and jail time that would be incurred upon anyone engaging in illegal logging, and the strict enforcement of these policies. The tension between the two perceptions was resolved by acknowledging that government action regarding deforestation clearly depends on the economic profit involved. If government actors could profit from selling the land to foreign countries and companies, deforestation was no longer an issue on their radar. However, in the case of local inhabitants wanting to clear land for

their farms or villages, the government, through municipalities, was strict in enforcement and punitive measures.

Perceived presence of activism

Awareness and accessibility to environmental non-profits largely resembled that of awareness of governmental assistance programs. In response to questions regarding the presence of activism and environmental justice campaigns, a few Hondurans mentioned COPECO, a disaster relief group based in Honduras, and one Guatemalan woman mentioned CONRED, an organization aimed at decreasing illegal deforestation. In regards to activism, however, many mentioned the land grabbing and water rights protests that frequently occur in Tegucigalpa and San Pedro Sula, Honduras, and in San Salvador, El Salvador. These protests weren't perceived as being particularly useful mechanisms for securing water rights, but more as angry demonstrations of a desperate public with no other options.

When the summer arrives, the price of water goes up—it's really expensive. And then because of the costs, or the scarcity, or the plumbing, lots of different neighborhoods in the city [San Pedro Sula] get their water turned off for ten or fifteen days at a time. That is when people go out to protest across the city. - Carolina, Honduras

We have our lands where we grow, and when the government tries to take it away, that is when we go out to protest. - Antonio, Honduras

Environmental ethic

Given the substantial level of awareness within the participants, a strong environmental ethic emerged from all when asked about their perceived value of the environment and reasons why protecting the environment was important. The majority of participants held that the environment was an essential component of their lives and of that for the greater world, particularly mentioning public health in a variety of contexts: the COVID-19 pandemic, clean air, food security, and drinking water availability. Every single interviewee made some form of connection between public health and environmental health, and from that intersection burgeoned the foundations for most of the participant's environmental ethics (Table 4).

Table 4. Reasoning behind environmental ethic and specific practices. Each participant was asked if they thought protecting the environment was necessary, and if so, why they thought it was important. Any potential or existing individual or communal practices to mitigate environmental stressors and secure resources were also recorded.

Reasons given for environmental protection:	Individual environmental practices aimed to mitigate defined stressor:	Environmental practices that participants thought should be implemented:
Food security/crop and agricultural output	Decreased pesticide use in farming Following rain seasonality Annually alternating crop species planted	Preventing human-initiated wildfires to protect soil health
Water supply	Participation in communal reforestation efforts	Increase efforts to decrease deforestation Regulation of water usage
Clean air quality	Participation in communal reforestation efforts	Stop burning trash as a method of waste control Limit pesticide usage Ban industrial sector from emitting chemicals and pollution into air Reforest areas so trees can help keep the air clean Prohibit destructive resource extraction, such as mining
Climate control	Participation in communal reforestation efforts	Massive reforestation efforts across the country Decreasing corruption in the government so as to stop extensive logging for profit
Wildlife protection	No hunting Protecting natural habitats by picking up litter	Reforestation so as to increase size of habitat Overall ecosystem protection so wildlife has necessary resources

The most frequently mentioned harmful environmental issue was deforestation. The five main concerns for environmental protection, food security as a byproduct of agricultural output, water supply, clean air quality, climate control, and wildlife protection (Table 4), were all perceived to intersect with deforestation. Declines in clean air quality, water supply for individual drinking and for agriculture, climate control, and wildlife habitat were all attributed to rampant deforestation. Since 17 of the participants primarily lived in the countryside, many stressed the importance of sustaining the integrity of the surrounding forests for climate control and water conservation. Individual practices of environmental conservation were limited, as most solely spoke of participating in community-led reforestation efforts. Some participants recalled having participated in special field trip days in their elementary schools where the entire class of students would go and help reforestation efforts.

Regarding a communal environmental ethic, upon being asked if there was a pervasive culture of caring for the environment, all but three participants stated that aside from strict communal policies banning the cutting down of trees, and the annual school trips so students could help reforest impacted areas, no other ethics or practices existed. Participants did share the specific practices they thought should be implemented for environmental protection of resources, given the absence of larger practices in place (Table 4).

Three participants also talked about the importance of environmental care in the context of avoiding future pandemics. Given the economic and social consequences of the COVID-19 pandemic in the Northern Triangle, the current public health situation has played a role in furthering environmental concern within some of the interviewees.

Experiences with environmental change

Perceptions of environmental degradation and the anthropogenic sources of such degradation were largely shaped by severe experiences dealing with drought, resource scarcity, and agricultural failure. The top environmental stressors experienced by the participants were water scarcity, the Eta and Iota hurricanes, drought, crop failure, and water insecurity (Figure 2). The most common experience brought up during the interviews was the Eta and Iota hurricanes, although regional differences influenced degree of impact among participants.

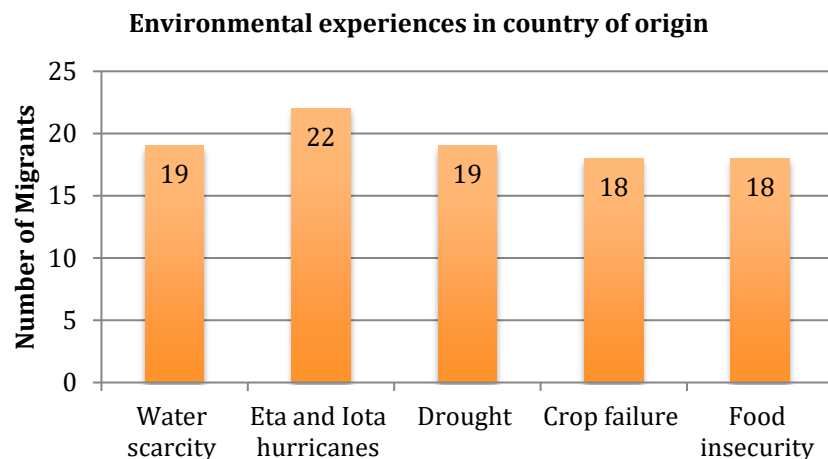


Figure 2. Most common experiences with environmental change. Throughout the interviews, participants brought up their experiences with these five particular stressors, in the context of direct environmental impact on their standard of living, as predominantly defined by health, access to resources, and livelihood.

Hurricanes

Twenty-two participants talked about their experiences during the Eta and Iota hurricanes during October and November of 2020. About half had received no such notice prior to the storms, and therefore were caught unprepared, while the majority of the other half was living in urbanized regions with more access to news outlets. Despite the alerts the latter group received from media and government officials, most said they were warned to prepare for heavy rains, and based on that information, heavily underestimated the impact the hurricanes would have.

It was so terrible, it was something unlike anything we had ever gone through, those hurricanes completely destroyed everything including our environment—it flooded our houses and our crops, and it impacted us heavily. - Jose, Honduras

The roofs of the houses were blown away, the structural supports collapsed, the houses were completely flooded—there was nothing we could do. - Liliana, Guatemala

The rain, lightning, and wind wouldn't stop, and since most of the houses aren't properly structured, the floods washed them away, and many people drowned . . . The hurricane lasted about 2 weeks, and destroyed almost all of my country, we lost everything. - Gabriel, Honduras.

The physical devastation that was the aftermath of the storms left many of the participants without shelter, food, and clean water. Many talked about their experiences with these hurricanes in relation to why environmental conservation was important, as natural disaster prevention became a priority to them post-storm. Others related their experiences to their perceptions of governmental corruption, as discussed above, as no relief was provided to the participants or their families.

Droughts and water scarcity

Eighteen participants attested to their general experience with increased heat and a decreased rain season, culminating in consistent droughts that most heavily occurred during the summer months. These droughts were linked to further experiences with water scarcity, crop

failure in the agricultural sector, and food insecurity as the heat and aridness depleted water sources and harmed crops.

Seventy-six percent of participants had experienced drinking water scarcity in their countries of origin, mentioning poor infrastructure, droughts, increased temperatures, shrinking bodies of water, and changes in seasonality as potential reasons for such experiences. Most of the participants held that these experiences of water scarcity had barely begun 3-5 years ago, and that in previous years they had never faced issues allocating water.

The most serious environmental issue right now is water. There is no water in Honduras. Certain neighborhoods and villages are left without water for more than three months, with no support from the government, and so people go and protest. It's too hot and now there is no water. - Fernando, Honduras

The summers are extremely hot—they kill everything that was planted. It used to rain during certain months, but that doesn't happen anymore. It is hot all the time. - Manuel, Guatemala

Crop failure and food insecurity

Among the participants, eighteen had experienced food insecurity during the last five years, however the reasons varied. Personal and familial economic struggles, most recently attributed to the devastating impacts of Eta and Iota, coupled with consistent crop failure and increasing food costs, pushed most into some form of insecurity before migrating.

Of the 22 participants that had worked in agriculture, 18 of them had experiences with crop failure. When asked about the reasons behind the crop failure, 14 mentioned climate, explaining that a lack of rain and hot weather created inadequate conditions for their crops, which were predominantly beans, corn, and coffee. Others brought up how pesticide usage and overexploitation of the soil through constant planting and tilling has degraded soil quality and health. Differences in food insecurity arose between the participants from urbanized regions versus those that had inhabited rural areas. The latter group depended on their own family's agricultural productivity to eat, while the food insecurity that urban residents had faced arose from rising prices and economic struggles.

My village depends on the maize and beans we grow nearby, so when the crops fail because of droughts, everyone is left to starve . . . we can try and purchase food, but our village is far away and remote and shipments don't always arrive. - Luis, Honduras.

In El Salvador we grow cucumber, melon, watermelon, maize, beans—and they all die because of the heat and chemicals we use. The harvests aren't what they used to be anymore, and the chemicals not only are affecting the soil but contaminate the air we breathe, too. - Jose, El Salvador

Ultimately, these environmental experiences are interconnected in source and impacts. There were regional differences as 4 of the 6 participants who hadn't experienced water scarcity were from Guatemala, indicating how participant exposure was dependent on specific location.

The role of environmental change on decisions to migrate

Although only four participants specifically named the environment as the main reason behind their migration, 68% held that declining environmental conditions was a factor in their decision to migrate. Within this group, the majority of Hondurans referenced the economic instability caused by the recent Eta and Iota hurricanes, and how the environmental destruction impacted livelihoods, job opportunities, and basic access to resources. These economic and environmental catastrophes then synergistically forced residents to migrate out of their country.

The participants that did not consider the environment a factor in their decision-making did however acknowledge that it could be a factor for others. With the exception of one participant, all recognized the existence of environmental displacement, identifying how the environment could play a role in someone's decision to migrate. This connection was predominantly made in the context of environmental changes causing crop failure and therefore spiking unemployment in the agricultural sector.

Throughout the entire group, other factors influencing decisions to migrate included violence, poverty, and unemployment (Figure 3). Although poverty was the most reported factor among participants, it is important to note how poverty, unemployment, and violence all work together to displace individuals. For example, of the 8 participants that reported violence as a factor, 3 of them had experienced extortion from gang-affiliated members. This form of violence

stressed the economic situation of their families as they were forced to pay monthly quotas, commonly referred to as “la renta”, further enhancing their poverty.

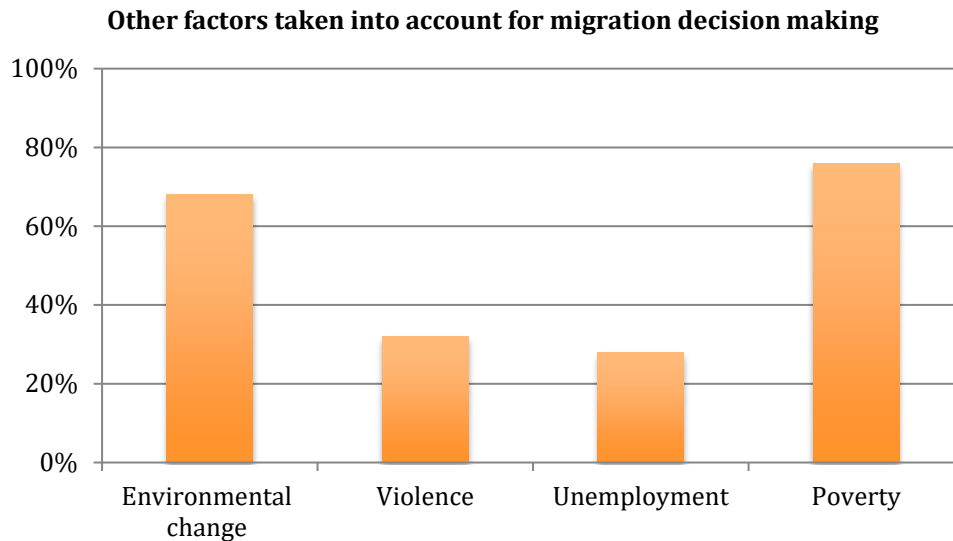


Figure 3. Percentage of migrants that cited each stressor as a factor in their decision to migrate. The values in this figure solely depict the percentage of participants who reported such factor as applicable to their decision to migrate, so the values are limited by each participant’s ability to identify the interconnections between each factor. It is also important to note the difference between unemployment and poverty, although the two are closely interconnected. The migrants that cited unemployment as a factor could have decided to stay had there been employment opportunities, versus migrants who cited poverty as a factor were not satisfied with their current employments.

DISCUSSION

The collected perceptions, practices, and narratives regarding environmental change and displacement reflect how the environment interacts with the cultural, economic, and political dimensions of the Northern Triangle. Experiences with water scarcity and food insecurity largely defined participant interactions with the environment while fueling public health concerns over resource conservation and ecosystem integrity. The negative perceptions on governmental corruption and existing aid further exacerbated the severity of environmental change impacts, as participants reported having virtually no channels to access for aid or relief. The lack of an effective support network, along with socioeconomic stressors and widespread environmental degradation created the context in which participants made their decisions to migrate from their countries of origin. Furthermore, the diversity in perceptions and experiences among the participants indicates the need to increase participation in local environmental activism, develop

mitigation strategies at the local to national level, and to address the international actors that contributed to the environmental situation of the Northern Triangle.

Foundations for increased environmental activism

It is clear that participant awareness of environmental processes did not stem from years of institutionalized education, but from heightened exposure to such processes. For example, the specific experiences of dealing with water scarcity and crop failure stressed participants nutritionally and economically as livelihoods and key food and water sources were diminished. These experiences, along with the compounded traumas of attempting to survive a global pandemic and dealing with the destructive hurricanes Eta and Iota, seem to have culminated in a communal recognition of the importance of the environment. Given the cultural values and practices participants mentioned growing up with, such as the school trips to reforest areas impacted by drought and wildfires, this recognition of the environment as a key to survival clearly existed prior to the events of 2020. However, the more recent environmental changes as observed and experienced by participants, such as the perception of a warming climate, a declining rain season, and the experience of the hurricanes, has strengthened this conclusion. Although participants had varying ideas about the specific roots and causes of all of these processes, the underlying acknowledgement that protecting the environment is an important part of decreasing these stressors and protecting public health, demonstrates a potential interest and willingness for future environmentalism and activism.

Overall there was little awareness on the environmental movements already occurring in the Northern Triangle countries, but the degrees of conscientiousness expressed in terms of taking care of the soil, the forests, and the natural sources of water indicate a general environmental ethic that may encourage future participation in community-led activism. Additionally, this expressed lack of awareness and participation may stem from inaccessibility to information and organizational efforts, instead of inability, unwillingness, or disinterest. Participant narratives describing the ineffectual and minimal efforts both the news outlets and municipal governments provided in emergency disaster preparedness before the hurricanes Eta and Iota struck, confirm this lack of infrastructure for communication. Strengthening

telecommunications may then be an important part of increasing participation in environmental activism, especially among rural communities and inhabitants.

Given the perceived corruption within the Northern Triangle governments and public actors, local management and community-led activism may be one of the only legitimate and effective forms of resistance available to this demographic (Ford et al. 2020; Grillos et al. 2021). However, the overwhelming economic struggles experienced by the participants are representative of common socioeconomic barriers present in these countries blocking public participation in such movements, as families and individuals spend their days and efforts striving to meet their financial necessities. Marginalized groups, such as women and indigenous peoples, are even more excluded as they face intersectional barriers that prevent their specific needs and narratives from gaining visibility for environmental policy-making (Lennox 2013). Additionally, the growing violence against environmental resistance and activists in Latin America may further hinder participation, especially when coupled with the perception that the government is actively contributing to the retaliation against such actors (Scheidel et al. 2020).

Despite the cultural and socioeconomic difficulties restricting participation, local environmentalism and activism still constitute one of the few viable pathways for public participation in mitigation against environmental changes (Grillos et al. 2021; Lennox 2013). In the context of the study participants, the Hondurans particularly demonstrated an ability and willingness to engage in community-led environmentalism by their actions against deforestation. There were two main parts to their resistance to such environmental change: instilling societal stigma against anyone who engaged in logging, and taking part in reforestation efforts. The first aimed to prevent deforestation, while the latter dealt with the aftermath of the process if it occurred. Furthermore, even though the popular practice of “cut down a tree, plant a tree” within the participants is ecologically problematic, the individual commitment to mitigate the consequences of deforestation was a powerful example of community action. Narratives involving the municipal fines for logging also depicted a less corrupt government when scaled down to the local level. However, this perception is in contrast by other participants who thought the local government did not care nor engage in environmentalism, despite its requirement in enforcing existing policies. The two narratives that emerged regarding municipal action against deforestation demonstrate the variability depending on location. Generalizations made at the national level cannot be applied at the local level, and in the context of environmental mitigation,

local needs, actors, and stake-holders must be taken into account to develop the best local strategies for mitigation and adaptation (Grillos et al. 2021; Hellin et al. 2018).

Shifting away from generalized environmental narratives

The experiences of the participants shape and confirm their perception that the environment is changing and degrading on a local to global level. Within the narratives that emerged, participant experiences with water scarcity were universally prevalent, and many stressed the fact that their individual experiences with water were not exclusive to them, but a common issue in their specific community and country. Although water inaccessibility emerged as a dominant theme, there were differences in perceptions of the problem among the participants. Illegal logging, deforestation, poor government management, lack of plumbing infrastructure, drought, and a changing climate were some of the perceived culprits behind this scarcity, as participants credited the issue to one or two of these sources. The varying rationalizations and interpretations of the water situation and of broader environmental change are important to analyze. Within this study it is unclear whether water scarcity as experienced by participants was solely due to climate change, deforestation, illegal land use, or a combination of all three. However, it is apparent that in order to discern the sources, smaller-scale research must be conducted on environmental changes taking place at the local and regional level. Furthermore, the narrative variability among participant environmental experiences confirms the importance of engaging with local stakeholders in assessing the true damages and sources of environmental change. This variability can also help inform international environmental politics and policy-making decisions for adaptation and mitigation schemas in the Northern Triangle.

Political efforts to address the range of issues described in the interviews need to be increased in earnest. Unlike wealthier societies, the Northern Triangle's populace for the most part lacks academic and economic power, and therefore most are limited in their ability to address environmental degradation through individual action alone. However, the existing environmental ethic and knowledge in these communities portray a region that would welcome effective policies to protect local resources from foreign extraction, address public health, and mitigate natural-disaster and anthropogenic impacts. In order to effectively address public environmental needs, policy-makers at every scale of governance need to shift from generalized

narratives on climate and environmental change to include those that pertain to marginalized communities and individuals, and inform their decisions with smaller scale investigations into environmental stressors. The regional and individual differences in experiences and understanding of environmental stressors must be taken into account (Lennox 2013; Mascia 2020). Acknowledging and integrating differential experiences will provide important details potential policy or practices could build on to address water scarcity, crop failure, and natural disaster preparedness (Lennox 2013; Hellin et al. 2018).

Pathways for addressing environmental displacement

Holistically analyzing the collected narratives, it is clear that participant perceptions, knowledge, and experiences regarding environmental change resulted in their ability to recognize the role of the environment in their own migration. Seventeen participants specifically credited the environment as a factor in their decision to migrate, citing experiences with water scarcity, crop failure, and the hurricanes Eta and Iota. The recognition of the environment as a source of displacement demonstrates awareness that ecological integrity, economic stability, and public health and safety are all interconnected. Given the absence of formal institutionalized education within the group, it is clear that this cognizance is more experiential in source instead of academically learned. In other words, participants learned by experiencing environmental change and stressors firsthand, exposed by both the degree of environmental change taking place in Central America and by socioeconomic factors that reduced their ability to seek protection and pathways for adaptation.

Recognition of Central American environmental degradation as a factor in displacement is essential in securing protection from an individual level to the international level. As more Central American inhabitants undergo environmental stress, it will become increasingly harder to mask the role transnational resource extraction, climate change, and corruption have played in creating these circumstances (Faber 1992; McNeish 2018; White 2009). In participant cases, decisions to migrate burgeoned not only from economic issues tied to gang extortion, unemployment rates, and agricultural decline, but also from the recognition that there were no avenues of governmental support available to them. For the most part, participants acknowledged the multi-factorial aspect of displacement, as a general concept and in their own migration. This

recognition demonstrates a foundation for potential human rights development, where individuals and communities can further connect environmental degradation to human rights violations, and utilize this premise as a potential route to secure international aid, remove anthropogenic stressors, and promote further environmental protection and policy in their countries. Fostering human rights oriented perceptions will be increasingly important as environmental conditions worsen, and as the relationship between the environment and human rights is further evidenced on a global scale.

Although addressing the anthropogenic processes behind environmental displacement is essential for mitigation and adaptation purposes, generalizing climate change and environmental degradation as human-induced masks the inequity and power dynamics that have led to the current situation (Levy and Patz 2015). Social, economic, and ecological consequences from unsustainable resource extraction, industrial waste production, and greenhouse gas emissions predominantly arise from the Global North and yet impact the Global South regions, such as Central America, the hardest (Levy and Patz 2015; McNeish 2018). Allocating full responsibility of these changes to the Anthropocene as an undivided whole erases the exploitation certain communities have been subject to and the disparity in contribution to environmental destabilization. Taking an environmental justice approach is essential in understanding the historic and present processes that lead to environmental displacement, and similar to acknowledging human rights violations, this approach can serve as a method for removing the most harmful foreign extraction presences in Central America, and for pressuring Global North countries to develop more just immigration laws and practices.

As of yet, environmental displacement is not recognized as a form of persecution or oppression, and therefore pathways to gaining asylum or refugee status via environmental situations are nonexistent. Developing such legal avenues constitutes one of the integral parts of adaptation schemas for Central American displacement, as committed environmental changes will continue to burgeon even if grand-scale intervention were to occur. In order to design appropriate and socially just policies, deviating from generalized climate experiences and integrating the perceptions, practices, and narratives of migrants, such as the participants in this study, will be essential in targeting the daily stressors and multi-factorial situations they experience (Mascia 2020).

Limitations

Ultimately the relatively small number of migrants I interviewed limits my study. As thousands continue to experience displacement from the Northern Triangle, this study would have to be replicated on a much larger scale in order to reach a more complete and accurate understanding of migrant perceptions, interactions, and experiences with the environment. Additionally, within the group I interviewed, the majority were men, so most of the narratives and interpretations reported came from a male's perspective and experience. Interviewing more women would have contributed to a greater and more holistic understanding of environmental experiences in the Northern Triangle, especially against the backdrop of the prevalent gender inequality and gender-based violence in the region (Schmidt and Buechler 2017). Furthermore although the semi-structured quality of the interviews allowed for a greater range of narratives and experiences, the variety and open-ended format of questions allowed for individual interpretation. Therefore, participant answers depended on each person's ability to recognize and define environmental components and processes, which may have resulted in misinterpretation and incomplete narratives. Lastly, the influence of socioeconomic factors on each individual's environmental perceptions and practices was left largely unexplored in the interviews. It is therefore unknown to what degree environmental ethics and practices arose from situational contexts instead of personal value systems.

Future Directions

Future research requires more investigation on climate change and environmental degradation resilience strategies and technologies with the goal of developing effective and realistic programs and policies for mitigation. Analysis of the non-profit sector's presence and efficacy is also essential in strengthening the communication pathways between organizations and vulnerable communities. Further analysis should delve into indigenous activism in environmental conservation, and cultural factors shaping environmental perceptions and ethics. Other efforts should investigate U.S. public and governmental perceptions on environmental change in Central America, as a foundation to increase awareness and willingness for

immigration law reform given that displaced Central Americans will continue to migrate northwards.

Broader Implications

Migration is for the most part not a long-term solution, and many of the problems migrants faced in their countries of origin follow them to their recipient countries and can be exacerbated by language and cultural barriers, and reduced access to family and support networks. Furthermore, governments, especially those that belong to the Global North, are increasingly stringent in their migration and refugee policies (White 2009; Kaushal 2019). On a global scale, militarizing borders has reached unprecedented levels as a response to anti-immigrant sentiment and a rise in nationalism (White 2009). Border patrols, airborne surveillance, razor wires, fences, walls, and radar, motion, and acoustic detection systems are all commonplace strategies deployed by nation-states to keep people out—an escalation in militarization unseen two decades ago (White 2009).

Particular to Central American migrants, as many flee northbound (UNHCR 2020), U.S. immigration policies quickly become an enormous barrier in their ability to relocate, gain asylum or other legal entry, and re-establish themselves (Garcia Hernandez 2019). The Trump administration's agenda on immigration only exacerbated that barrier, as asylum approval rates have dropped by 37 percent since fiscal year 2016 (Human Rights First 2020) and the administration largely worked to deter and block migrants from gaining entry. Policies such as the Transit Rule and the Migrant Protection Protocols, ban migrants who transit through other countries and upon reaching the southern border of the U.S. are returned to Mexico to wait for their court date. These policies dangerously expose Central American migrants who are then forced to wait up to years in limbo, without the ability to settle or seek work authorization in Mexico, and are put further at risk for sequestration, exploitation, and harm (Garcia Hernandez 2019). Furthermore, if migrants manage to survive the wait, upon reaching their court dates and appointments, the approval rates are dismal, as demonstrated by the current asylum grant rate of 13.3% for Northern Triangle asylum-seekers (Human Rights First 2020).

Although the Biden administration is now effectively in force, it will take months for the administration to undo all of the harmful practices and policies the Trump administration set in

place, if doing so is even a priority for the new presidency. Historically, both prominent political parties have worked to keep immigrants out, and it is unclear to what extent immigration reforms will be developed by the Biden presidency. Problems migrants encounter are not exclusively political in source, as even for the small percentage of migrants who do make into the U.S.—authorized or otherwise—integration into American society is plagued with obstacles, such as racism, language barriers, and a lack of a social safety network (Garcia Hernandez 2019).

As a global leader, and one of the world's wealthiest nations, it is harrowing the extent to which the U.S. has gone to in order to limit migrant's entry and assimilation. This negligence, apathy, and lack of action can be seen on a global scale, from individual politicians to entire governments on the international stage—an enormous problem considering the current hundreds of thousands of asylum seekers and migrants waiting at the border. This number will only continue to grow as climate change exacerbates the environmental, political, and socioeconomic situations of vulnerable populations worldwide, particularly in the climate sensitive region of the Northern Triangle.

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