Climate-Health Risk (In)visibility in the Context of Everyday Humanitarian Practice

Article's DOI: https://doi.org/10.1016/j.socscimed.2024.117081

Title: Climate-Health Risk (In)visibility in the Context of Everyday Humanitarian Practice

Authors

1. John Doering-White, University of South Carolina
2. Alejandra Díaz de León, University of Essex
3. Arisbeth Hernández Tapia, Universidad Iberoamericana Ciudad de México
4. Luisa Delgado Mejía, Boston University
5. Sabina Castro, El Colegio de México
6. Kendall Roy, University of South Carolina
7. Gabriella Q. Cruz, University of South Carolina
8. Sarah Hudock-Jeffrey, Independent Scholar

Abstract

Nongovernmental migrant shelters in Mexico play a key role in documenting the factors that shape forced migration from Central America. Existing intake protocols in shelters are largely oriented to humanitarian legal frameworks that determine eligibility for international protection based on interpersonal violence and political persecution. This qualitative study calls attention to how existing humanitarian logics may obscure climate- and health-related disruptions as drivers of forced migration from Central America in the context of everyday humanitarian practice. We compared migrant's responses (n=40) to a standardized intake protocol at a nongovernmental humanitarian migrant shelter in Mexico with responses to semi-structured interviews that focused on migrants' perceptions of climate change and health as drivers of forced displacement. We found that slow- and rapid-onset climatic disruptions; illness and disease; and various forms of violence and repression are often interrelated drivers of forced displacement. Comparing intake protocols and in-depth interview responses, we found that climate- and health-related drivers of forced displacement are rarely documented. These findings speak to the importance of critically examining everyday humanitarian practices in the context of ongoing advocacy that calls for climate-related disruptions to be integrated into existing humanitarian protection frameworks.

Acknowledgements

This research received funding from the University of California Research Program on Migration and Health and the University of South Carolina Office of the Vice President for Research

Conflict of Interest

The authors declare no conflict of interest.

Corresponding Author Details

John Doering-White, College of Social Work and Department of Anthropology, University of South Carolina, 1512 Pendleton St. Columbia, SC, 29208, doeringj@mailbox.sc.edu

1. Introduction and Background

Across Mexico, several dozen loosely networked nongovernmental migrant shelters provide various forms of aid to people migrating along railway and highway corridors, primarily from Central America. Migrant shelters have long served as key sites for documenting drivers of forced displacement from Central America, including health-related factors (Servan-Mori et al., 2014; Stoesslé & Gonzalez-Salazar, 2021). This documentation work has repeatedly shaped migration-related advocacy and policymaking within and beyond Mexico (Basok & Rojas Wiesner, 2017). This article examines how Central Americans who accessed a nongovernmental migrant shelter in Central Mexico perceived the impacts of climate- and health- related disruptions in shaping their decision to migrate. We also examine how climate change and health as interrelated drivers of forced displacement may be obscured in the context of everyday humanitarian practice. To do so, we compared 40 migrants' responses to a standardized shelter intake protocol with responses to a semi-structured interview that focused on how, in the eyes of interviewees, climate change and health intersect with other drivers to shape forced displacement.

Our analysis puts scholarship on migration and international protection into conversation with research on the ways that climate change threatens health and well-being worldwide, often by amplifying existing social inequities (Patz et al., 2014; Watts et al., 2015). Parry and colleagues (2019) argue that the quality of current understandings of such "climate-health risks"

(2) are unevenly distributed across regions, socio-economic systems, and racialized hierarchies. Historically marginalized communities, for example, are more likely to depend on rain-fed agriculture and outdoor work that increases exposure to heat, and to inhabit flood-prone informal settlements with limited access to sanitation, clean water, and electricity (Borg et al., 2021; Watts et al., 2015). Histories of health-related racism, indifference, and coercion can lead minoritized communities who are disproportionately vulnerable to climate risks to mistrust and avoid health systems (Cerón et al., 2016; Gouritin, 2022). This, in turn, may lead to systemic biases in the quality of health data and estimation of climate-health risks (Burgard & Chen, 2014). In theory, gathering better information and giving more visibility to marginalized communities can motivate better policies and facilitate demands for rights protections. However, invisibility can also be a community harm prevention strategy for avoiding exposure to state repression and control (Scott, 2009; A1). This article calls attention to humanitarian organizations in transit migration contexts as crucial sites for understanding how such dynamics of (in)visibility play out in the context rising concern regarding climate-related displacement.

In recent years, projections of future mass migrations caused by climate change have generated debate among policymakers, scholars, activists, and broader publics around the prospect of recognizing climate-related displacement as grounds for asylum (de Haas, 2020; Draper, 2024; Hiraide, 2023; Munoz, 2021). Some argue that growing attention to "climate refugees" can pressure governments to pass policy reforms that account for anthropogenic climate change. Amnesty International (2020), for example, lauded a 2020 UN ruling that governments must account for linkages between climatic change and human rights violations when considering the deportation of asylum seekers. Others, however, suggest that "climate refugee" discourses are oversimplified, deterministic, and empirically questionable "myths" that

inappropriately portray mass population displacement due to climate change as inevitable (Boas et al., 2022; de Haas, 2020). A related concern is that such discourses may in fact limit access to international protection by amplifying alarmist rhetoric and justifying expanded border securitization efforts (Bettini, 2013; de Haas, 2020; Munoz, 2021). In response, recent research has focused on how climatic disruptions interact in complex ways with political, economic, social, and demographic drivers of forced displacement (Hunter et al., 2015; McMichael, 2020). Ingrid Boas, for example, suggests that "relations between climate change and human migration are often indirect, small-scale, and take shape in context-specific ways, influenced by a host of other socio-economic and political factors" (Boas et al., 2022, 3365).

Central America's northern triangle (Guatemala, El Salvador, and Honduras) has been a core arena for these conversations. Central America is considered one of the world regions most vulnerable to future climatic disruptions (Eckstein et al., 2021). In addition to rapid-onset disasters like back-to-back hurricanes Eta and Iota that hit Honduras in 2020, slow-onset disruptions such as sustained drought, rainfall variability, temperature extremes, and the intensification of crop diseases like coffee rust have made meeting the basic needs of everyday life increasingly untenable for a significant share of Central America's population (Bouroncle et al., 2017). Existing scholarship demonstrates that climatic disruptions are expected to exacerbate several socially determined negative health outcomes in the region, including water scarcity and access to safe drinking water (Leal Filho et al., 2016; Reyer et al., 2017). In 2018, for example, 82% of maize and bean crops in Honduras failed due to drought, leaving an estimated 3 million people vulnerable to food insecurity (IOM, 2019). Current climate change patterns are also expected to expand transmission suitability ranges and season duration of insect-borne diseases including malaria and dengue (Semenza et al., 2022).

Meanwhile, a parallel body of scholarship has examined the relationship between climate change and forced displacement in the region. Smallholder farmers fleeing rural areas most heavily impacted by climate change make up a growing share of people arriving at the U.S.-Mexico border (Donatti et al., 2019; Pons, 2021). Existing studies have tended to focus on whether and to what extent climatic disruptions are correlated with border apprehensions and asylum seeking (Missirian & Schlenker, 2017; Schutte et al., 2021). A study by Bermeo and Leblang (2021), for example, shows that areas of Honduras with the highest rates of rainfall variability are associated with increases in family apprehensions at the US-Mexico border, and that this effect is amplified in areas with higher levels of violence. Crucially, Bermeo and Leblang caution that this does not imply a clear distinction between people fleeing climate change and people fleeing violence. They argue instead that we should think about climate change *and* violence as shaping displacement, such as when a person migrates internally due to climate change and later migrates externally due to violence.

Similarly, Daniel Reichman (2022) warns against drawing connections between a discrete variable such as rainfall levels and migration decisions. Reichman outlines how a boom in export-driven coffee production in Honduras' dry corridor beginning in 2010 led families to plant coffee in higher-elevation cloud forest areas and to shift subsistence crops to marginal low-lying areas that are more vulnerable to climate shifts. In 2014, after droughts caused by El Niño destroyed these subsistence crops, many families could no longer turn to subsistence crops in higher elevation areas that were now planted with coffee. As a result, families experiencing food insecurity increasingly attempted migration, taking on loans from relatives in the United States, micro-finance programs, and local moneylenders to pay smuggler's fees and finance migration journeys. Lauren Heidbrink (2019) has shown that because families regularly put up land and

other assets as collateral, this debt often compounds if a person is deported. Without subsistence farming to fall back on, the promise of future wages gained by attempting to migrate again is one of the few options for paying off debt-financed migrations.

These prior analyses illustrate how the mutual constitution of climate change, global commodity prices, family remittance dynamics, and smuggling economies complicates efforts to isolate "roots causes that might otherwise be treated as discrete causal forces" (Reichman 2021, 90). This article calls attention to the role that humanitarian infrastructures in Mexico play in how climate change and health as interrelated drivers of displacement are made knowable and governed. Within shelters, an otherwise clandestine social process becomes visible to human rights advocates, journalists, and academics. However, shelters are also sites of performance and dissimulation (A1; A1 and A2). As Noelle Brigden (2018) and Wendy Vogt (2018) have shown migrants, aid workers, and people posing as migrants to take advantage of them often draw on social scripts to both illuminate and conceal whether, for example, a person is traveling with a smuggler, or what their life was like back home. Moreover, shelter intake protocols—a core aspect of documentation work within shelters—are often completed as quickly as possible in a relatively public context and amid racialized and highly politicized and mediatized structures of suspicion, fear, and coercion that incentivize migrants and aid workers alike to minimize what is asked and what is disclosed (A1; A1 and A2; Wolf, 2021).

These ambivalent dynamics of (in)visibility are structured by broader transformations in the politics of humanitarianism and migration management in Mexico. Over the past fifteen years, Mexico's NGO shelter system has transformed from a small set of grassroots organizations that facilitate transit migration toward the US-Mexico border to an increasingly professionalized network of organizations that is incentivized by transitional institutions like

UNHCR and IOM to facilitate access to asylum in Mexico (Angulo-Pasel, 2022). Some argue that shelters are increasingly enrolled in the depoliticization of migration management to the extent that ostensibly apolitical organizations reproduce distinctions between deserving asylum seekers and underserving economic migrants who are often perceived as a security threat (Angulo-Pasel, 2022; Varela Huerta, 2019). These analyses echo scholarship that considers humanitarian organizations as sites of governance where migrant/refugee binaries are reproduced in the context of everyday aid work (Galemba et al., 2019; Hamlin, 2021).

Building on this prior work, the present study calls attention to humanitarian aid infrastructures that operate in transit contexts as crucial, albeit generally overlooked systems that shape how the complex relationships between climate change, health, and forced migration might be understood and, by extension, governed. How, we ask, do humanitarian infrastructures play a role in shaping how climate-health risks are perceived, made visible, and obscured? And how might growing attention to climate change and health as drivers of forced displacement and a topic of concern both unsettle and reproduce existing logics of humanitarian governance?

2. Methods

2.1 Study setting

This qualitative study draws on 40 semi-structured interviews in May of 2022 with migrants who sought services at "La Casita," a nongovernmental migrant shelter in Central Mexico, as well as interviewee's responses to the shelter's standard intake protocol. The intake protocol documents basic demographic information, a person's reason for migrating and whether a person considers their life to be at risk in their home country. Migrant shelters have commonly served as a relatively safe space for journalists, advocates, and researchers like ourselves to document

migrants' experiences, as well as the politics of knowledge production, performance, and dissimulation (Brigden, 2017; Vogt, 2018; Wolf, 2021; A1; A2; A1 and A2;). A1 and A2 have conducted ethnographic fieldwork at La Casita and other migrant shelters across Mexico since 2015. As researchers, we strived to generate research that is "self-reflective, autocritical, and engaged with those communities that [we] are studying" (Pacheco-Vega & Parizeau, 2018, p. 2) by embedding ourselves in the daily life of the shelter and reflecting on how our positionality shapes the data that we collect. We recognize that migrants are the experts when it comes to their health, their journeys, and the effects of climate change on their lives. Cognizant of power differentials that shape research within shelters, we approach migrants with the intention of learning from their expertise (Pacheco-Vega and Prizeau 2018). The study received ethical approval from the [REDACTED] Institutional Review Board. To protect confidentiality, all interviewees and the names of certain organizations have been provided with pseudonyms.

Interviewing people in transit allowed us to talk to people who had decided to leave and who were able to reflect on their reasons for doing so. We were not able to talk to people who did not or could not migrate and we were not able to observe group decision processes such as how a family might decide who would leave who would stay behind. Our methodology allowed us to capture some people who will never arrive at the US-Mexico border or at the United States and thus would have never appeared in CBP apprehension data or surveys that tend to focus on northern destination sites.[1] All three of the migrant routes that come from the southern border converge in the region of La Casita[2], so our choice of shelter allows us to capture a wide variety of migration experiences and routes. One of the limitations of doing research in shelters is that

[1] https://www.colef.mx/emif/

[2] see the MSF map of routes for more information: https://www.msf.org.co/wp-content/uploads/2023/07/Mapa-MSF-en-ruta-contigo.pdf

we cannot interview migrants who stay in safehouses, hotels, and who travel with smugglers who do not take them to shelters. This also limits our access to women and to migrants with greater economic resources or family support who tend to avoid migrant shelters.

2.2 Procedure

We approached data collection from a position of accompaniment that strived to harmonize our research questions and methods with the shelter's everyday operational needs while minimizing the potential for people accessing the shelter to feel compelled to participate in exchange for receiving services (Frank-Vitale et al., 2019). Most days, A1 and A2 split time assisting with the shelter's routine intake procedure and conducting follow-up interviews. During intake interviews, we introduced ourselves as researchers interested in understanding why people had left home and what they had experienced while in transit. We also introduced ourselves a second time to the shelter's guests when everyone lined up for meals. During the pre-meal introductions, we reiterated that participation in interviews was voluntary and that willingness to participate in an interview would not impact a person's ability to receive shelter services. Finally, we made a point of sitting in the shelter's common areas and waiting for shelter guests to approach us about participating in an interview. Sometimes, we initiated follow-up ourselves.

Before beginning interviews with migrants, we explained that we would like to make an anonymized record of their responses to the shelter's intake interview, but that agreeing to share that data was optional. While some interviewees agreed to share their intake data before beginning the interview, we also asked for permission at the conclusion of each interview. All interview participants agreed to share their intake data with us. All interviews were conducted in

Spanish by A1 and A2, the other authors were not present at this stage. Audio recordings of interviews were professionally transcribed.

In the interviews, we asked the migrants about their lives back home and their migration processes following a loose set of topics. We inquired about the changes they had seen in the weather. Some immediately replied by telling us about heat, droughts, hurricanes, or plagues. Others took a while longer to link their experiences to the changing climate. A small minority emphatically denied that climate stressors had any effect on their lives and their decisions to migrate. Regardless of their answer, we then asked about their health back home, about their definition of health, and about what triggered their migration decision. We also asked about their migration experience. The interviews were not constrained by the shelter intake protocol.

For each interviewee, we completed an anonymized worksheet that included several key domains from the shelter's intake protocol as well as several domains that guided our in-depth interviews with migrants. These domains included perceived climate impact (direct, indirect, none), climate impact type[3], health and disease, prior migration experience, encounters with violence, and any additional notes. Information collected on the worksheets was transferred to an excel spreadsheet.

A1 and A2 complemented the interviews with participant observation. While it is difficult in shelter settings to observe how migrants are affected by the climate outside of interviews, there were some moments in which we learned about how they related to the climate and to their health. Once, when it started raining on an otherwise sunny afternoon, a man from

[3] In the intake protocol there is a question that asks migrants their reasons for leaving. Among ten other answers, one of the possible answers is "environmental factors". In our experience, volunteers never read the full list of reasons when asking this question and migrants rarely said anything that could not be categorized as economic factors or fleeing violence.

Guatemala looked up and told those around him: “this is the first rain of the season, back home I would be getting ready to plant the corn”. This led to a long conversation between people who had worked the land about when they planted which crop and how the rain had been inconsistent in the previous days. Another time, the shelter received a donation of huge sacks of rice. As some of the men tried to pick them up to carry them to the kitchen, they started talking about how much a quintal[4] weighed and how many they had to carry daily. They talked about how the body gets tired in the sun and about how carrying quintales became harder as they became older. While we focus in this article on interview data, participating in the life of the shelter opened windows into aspects of people’s lives that we discussed more deeply in interviews.

2.3 Participants

40 people agreed to participate in the interviews. 38 out of 40 interviewees identified as men.[5] 47.5% of participants were between 18 and 29 years old, 27.5% were between 30 and 39 years old, and 15% were between 40 and 49 years old. The youngest participant was 18 years old, and the oldest participant was 55 years old. 23 interviewees were Honduran, three were Guatemalan, and two were Nicaraguan. While Honduran participants migrated from a broad range of departments (akin to states in the U.S. context), the most heavily represented were Comayagua (17.5%), Yoro (12.5%), Choluteca (10%), and Copán (10%). 58% of interview participants listed “campesino” (farmer) as their occupation. 22% listed albañileria (bricklaying or, more generally,

[4] A quintal is a unit of mass that is equivalent to 100 pounds or 46 kilograms.

[5] The limited number of interviews with women is a limitation of this paper given that an estimated 49% of Central American migrants overall are women (IOM, 2020). However, the share of women included in the sample is consistent with the overall demographic profile of people seeking services at the shelter, which predominantly serves men. For an examination of climate change, migration, and gender, see Hernández-Albújar & Sánchez-Carrasco, 2023.

construction) as their occupation. Additional occupations included, for example, “comerciante” (sales), “ama de casa” (stay-at-home mom), and “chofer” (driver).

2.4 Data Analysis

We employed team-based reflexive thematic analysis to analyze the interview data (Braun & Clarke, 2019, 2022; Guest & MacQueen, 2008). Reflexive thematic analysis acknowledges that researcher subjectivity, positionality, and guiding assumptions play a role in how data is conceptualized, collected, and interpreted. Interview domains included on the interview worksheet, for example, were informed by our prior ethnographic research at La Casita and other shelters across Mexico since 2015 (A1 and A2; A1; A2), as well as a pilot study in the summer of 2021 in which we tested the protocol for this study (A1 and A2). In addition to these a priori themes, A1 and A2 compiled a running list of preliminary themes in daily fieldnotes that emerged during data collection.

All authors participated in the data analysis by carefully reading each interview and coding the interviews based on the a priori interview domains included on the interview worksheet and the preliminary inductive codes developed by A1 and A2. Based on this first reading, the remaining members of the study team (A3-A8) also developed a preliminary list of additional themes in conversation with A1 and A2. All authors then developed a preliminary codebook as a team that included the a priori interview domains and several subcodes that reflected topics discussed commonly across the sample of interviews. After two team members per interview applied the preliminary codebook independently to a subset of transcripts, we made refinements and clarified inclusion and exclusion criteria before conducting a final coding of the transcripts.

3. Findings

In what follows, we begin by describing participants' responses to the shelter's standardized shelter intake protocol and response patterns that emerged in the context of in-depth interviews. We then describe how participants discussed health-disease processes and climate change as related factors shaping their migration. For each health-related theme, we identify case examples that illuminate how direct and indirect impacts of climate change intersect with health-disease processes to shape how interviewees conceptualized their migration experience.

3.1 Comparison of Intake Interview Responses and In-depth interview responses

Comparison of participant responses to shelter intake interviews and in-depth follow interviews suggests that climate-related drivers of forced displacement may remain formally invisible in the context of everyday documentation practices within migrant shelters. In responding to the shelters' intake protocol, 90% (36/40) of interviewees stated "financial reasons" as their primary reason for migrating. The remaining 10% (4/40) listed "violence." Meanwhile, 82.5% (33/40) of interviewees explained during follow-up interviews that climatic disruptions were a factor shaping their decision to migrate. The remaining 17.5% (7/40) of interviewees did not see climate disruptions as a relevant factor shaping their decision to migrate although this doesn't mean that they denied the existence of climate change.

Of those who discussed climatic disruptions as a factor shaping their decision to migrate, 55% (22/40) referenced being directly impacted by climate change when discussing their motivation for migrating. Examples of direct impacts include rapid-onset climate events such as hurricanes and floods that destroy a person's home, as well as slow-onset climate events such as

inconsistent rainfall variability that compromise a farmer's crops. Examples of indirect impacts include individuals who described being impacted by the direct climate impacts on another person, or on a broader community. These include, for example, how the economic consequences of climate disruptions for one sector of the economy, such as agriculture, in turn impact individuals who make a living in another sector of the economy, such as food vendors impacted by commodity prices.

3.2 Patterns of climate-health risks and migration

Interviewees drew explicit connections in the context of in-depth interviews between their personal experiences with climate-health risks and their migration decisions. In what follows, we explain how interviewees related several health-related concerns to both direct and indirect climate disruptions in explaining their decision to migrate. Health-related concerns identified most by interviewees include (1) lack of access to medical care and medication, (2) food insecurity and malnutrition, (3) lack of access to potable water, and (4) excess heat. When possible, we also contextualize migrants' perceptions of climate change with evidence from existing scholarship.

3.2.1 Lack of Access to Medical Care and Medication

Several interviewees made direct connections between climatic impacts, lack of access to medical care, and their decision to migrate. Martín, for example, is a farmer and a father of two from Copán, a mountainous region on Honduras' western border with Guatemala that depends heavily on coffee production, a crop that is particularly sensitive to inconsistent rainfall variability. He reflected on how the impacts of drought, together with the high cost and limited

availability of medicine in his community's medical clinic shaped his decision to migrate: "Where we live there is a medical clinic but there is barely ever any medicine available. The medicine is also expensive." Prior studies show that residents of mountainous interior regions of Western Honduras—many of whom walk to clinics—are regularly turned away due to insufficient staffing and/or lack of medicine (Bast & Jenkins, 2018). Access to health care in Honduras is spatially uneven and low-income people are less likely to be able to get diagnosed and treated (Fullman et al., 2018).

Martín explained that coping with the cost of even minor illnesses had become more difficult in part because of how changes in rainfall patterns had impacted agriculture in the region where he lives:

> Where I live it rains one day a month. All this year and last year there wasn't a good harvest. The creeks are dry. It's complicated. So, yea, people are talking about changes in the climate and how it no longer rains. It's making life very hard. It started four years ago. Since then, it's only summer and doesn't want to rain. I've stopped cultivating where we live because you can only plant in the winter since in the summer there isn't water to irrigate.

Martín explained how in the past four years it has felt like "it's only summer," associating lack of rain with the absence of the wet winter season. He is one of many people in rural communities across Honduras who depend almost entirely on rain-fed agriculture to make a living and have limited capacity for coping and adapting to sustained periods of drought (Dodd et al., 2020; Keller et al., 2018). Having struggled to make ends meet over the course of four years of drought, Martín decided to leave Honduras and attempt to make it to the United States.

Other interviewees described more indirect climate impacts and their relationship to medical care. Ever, a bricklayer from Paraíso and a father a five explained how the kind of sustained drought that Martín discussed, as well as the increased prevalence of coffee rust

(*hemelia vasatrix*), a fungus that defoliates arabica coffee varietals (Jawo et al., 2023), has downstream impacts on other sectors of the economy, including construction.

> Yea, rain is an issue. Usually in winter there is more rain. Most people [in Paraíso] make a living from growing coffee and corn. The crop that generates the most money in the country is coffee, but a few years ago a plant disease called roya (coffee rust) damaged the coffee and because of that work and the economy in general has gone down. So, in that way climate has impacted me.

Like Martín, Ever made connections between these climate impacts, financial instability, the cost of medicine, and migration pressures:

> I live day by day. What I earn in a day, that same day I spend it on food. There isn't any way to save up a small amount in case one of my kids gets sick. If one of my kids gets sick I go to one of my neighbors or a friend and ask for money, or I ask to borrow money from my boss. On top of that, the public medical centers often don't have medication, even aspirin. So, you have to risk it and migrate because I'm not going to let one of my kids die.

For both Martín and Ever, lack of access to medical care and climatic disruptions were interrelated factors shaping their decisions to migrate.

3.2.2 Food Insecurity and Malnutrition

Food insecurity is a second climate-health risk that interviewees raised in discussing migration pressures. Santos, a fisherman from Choluteca on the Pacific coast of Honduras, explained how increasing storm surge frequency and intensity has negatively impacted his ability to feed his family. In the wake of hurricanes Eta and Iota, back-to-back hurricanes that passed through Honduras in 2020, Santos struggled to find food after coastal waters contaminated by storm-related run-off—most likely agricultural pesticide—prevented him from fishing:

> [After Eta and Iota] we ate rotten corn. The government gave us some bags of corn that smelled like fertilizer. After that we only ate fish and mollusks that we could catch. But there was a period when we couldn't even eat fish. Runoff from the storm contaminated the waters and the fish turned red. They were contaminated so couldn't eat fish.

While hurricanes Eta and Iota are rapid-onset climate events, they also reflect slow-onset climate impacts to the extent that tropical cyclones are becoming more frequent and intense as surface water temperatures rise due to anthropogenic climate change (Knutson et al., 2021). Santos explained that stronger and more frequent storms are at front of mind for members of coastal fishing communities:

> Yea, people talk about climate change. We get storm surges in the winter months with waves up to six or seven meters. They've eaten up something like 200 meters in from the coast. They now reach where we have our homes and we have to flee. Sometimes we stand up at night holding our kids while they sleep because the waves pass through our houses and we have to stay awake to hold them and be ready to move our things off of the floor.

Extreme weather events, especially drought or intense rainfall increase recurrent and episodic food insecurity for smallholder farmers in Central America (Alpízar et al., 2020; Fuerte Celis et al., 2024). Whereas for Santos, increased storm intensity and frequency has negatively impacted fish supply, most interviewees described how changes in climate have reduced their ability to rely on rainfed agriculture. Daniel, for example, is a father of three from La Paz in central Honduras who depends on subsistence plantings of corn, rice, and beans to feed his family. As he explained, inconsistent rainfall variability and shifts in season duration and temperature ranges have reduced the productivity of crops that he plants: "Winter is no longer consistent; it isn't predictable so the crops can't take hold (*no se pegan*). And in the summer, nothing grows. That's why we've started to leave our country to seek a better future."

Just as Daniel made connections between climate variability and his decision to migrate, he also explained that this decision was shaped in large part by his experiences with food insecurity:

> If we don't have rain, sometimes we'll have six or seven months straight of summer, so we'll only get one crop from what we plant in the winter. We don't produce a lot, just

> enough for a few months and only for ourselves. And with how high food prices (*la canasta básica*) are right now, it's hard to have enough to eat.

In Central America, smallholder farmers are among the most vulnerable populations to food insecurity in the region. Many have to decrease their food portions during at least three months a year to cope with diminished crop yields (Alpízar et al., 2020). The changing climate is causing important declines in crop yields for many staple foods such as maize and beans as well as cash crops, like coffee, in Central America (Alpízar et al., 2020). Santos and Daniel drew clear connections between climatic disruptions and food insecurity. However, like many interviewees, both listed poverty as the primary reason for leaving Central America in the context of shelter intake protocols.

3.2.3 Drought and Lack of Access to Clean Water

Lack of access to potable water was a third climate-health risk that interviewees discussed as shaping their decision to migrate. A significant body of existing literature links incidence of diarrhea and cough to lack of access to clean water, particularly for children (Headey & Palloni, 2019). Across Central America, marginalized individuals tend to inhabit areas with limited access to infrastructure (water, sanitation, electricity, as well as safety nets like community organizations and healthcare) that are at greater risk from floods and landslides (Romero-Lankao et al., 2014). New research has argued droughts in Central America force people from the countryside to move either because they lose their means of survival or because they lose their jobs (Fuerte Celis et al 2024).

Isaac is a shop owner from a village outside of Comayagua in central Honduras. He described how pine bark beetle (*el gorgojo* in Spanish) infestation of coniferous forests, together with elevated heat and drought, has intensified forest loss and, in turn, lack of access to clean

water: “Yea, people are talking about climate change because of how the forests have been destroyed. A few years ago, there was a disease called *el gorgojo*. They eat the bark around the tree. The tree dries up and that leads wells to dry up.” Anthropogenic climate change has increased the initiation and spread of pine bark beetle outbreaks throughout Central America (Valdez Vasquez et al., 2020). This spread is facilitated by drought and elevated heat levels, which elevates foliage stress and leaves trees more susceptible to infestation. While loss of water-consuming trees increases water yield in streamflows, it also decreases soil infiltration of water for human consumption. This can in turn decrease water quality by increasing erosion and water turbidity (Mapulanga & Naito, 2019).

Like Isaac, lack of access to water was also a primary concern for Hector, a father of three, also from Comayagua, who works in rice cultivation:

> The climate change that is most affecting us in our community is access to water. Where we live, there is no longer an abundance of water like there was in the past. We humans have done it to ourselves by cutting down the forests. Fresh water springs have become scarcer.

For Hector, loss of abundant water is a direct consequence of anthropogenic deforestation. Indeed, pine bark beetle infestation is but one of many other forces contributing to deforestation in the region, including, in addition to the expansion of industrialized cattle ranching and solar farms has contributed to deforestation in the region (Fash, 2022; Tellman et al., 2020). Hector went on to explain that, in addition to the loss of freshwater springs, members of his community have also been impacted by water contamination from industrial inputs: “If someone works for long in rice fields their lungs suffer they develop aches in their bones because of the kinds of chemicals they use to work the rice.” Isaac’s and Hector’s experiences exemplify how water scarcity and water contamination caused by the expansion of extractive economies are intertwined as climate-related social determinants of health that structure migration decisions.

3.2.4 Heat-related Physical and Mental Health Stress

A fourth and final climate-health risk that interviewees discussed in relation to their decision to migrate was heat. Several interviewees described the direct and indirect impacts of heat in discussing migration pressures. Luis, for example, described noticing how much hotter and variable the climate has become in Honduras after he returned from living in Texas and Louisiana for several years. Compared with when he left Honduras in 2004, "The climate has changed radically," he explained. Luis described the heat as unbearable: "The heat has changed too. It's a strong heat. The temperature is exasperating. You sweat just sitting there. It's insufferable." Luis went on to explain regularly experiencing symptoms associated with heat stroke, and his attunement to its cumulative impacts:

> The heat impacts you because at the end of the day you come home after working eight hours and you have a headache and your body temperature just won't go down. You feel like your body isn't right. Your bones ache and your head too, from the heat. It has an impact on your health, I think. With time, it harms you.

High heat stresses human bodies, both physically and mentally (Meadows et al., 2024). Recent scholarship links elevated heat exposure as a result of anthropogenic climate change to increased mortality (Vicedo-Cabrera et al., 2021). People with limited access to the resources discussed above, including clean water and medical care, are particularly susceptible to the negative impacts of heat (Hess, 2023). Our interviewees were people who worked outside, increasing their exposure to outdoor heat. Additionally, most of their nutrition came from rain-fed agriculture, something that is also affected by the heat.

Elevated heath levels in the region also underlie several of the climatic conditions already discussed. Heat intensifies storms, exacerbates deforestation, and contributes to drought. In turn, more people moving to urban areas accelerates changes in land cover from vegetation to asphalt

roads and concrete buildings (Ortiz et al., 2022). These settlements are generally unplanned and built in floodplains or mountain slopes, which are more likely to face weather-related risks, increasing the urban poor's vulnerability (Hardoy & Pandiella, 2009). In these peri-urban peripheries, poor air quality and lack of access to clean water and sanitation contribute to high prevalence of respiratory diseases, diarrhea, and vector-borne infectious diseases such as dengue and malaria (Ortiz et al., 2022). These settlements are generally built on floodplains or mountain slopes, which are more likely to face weather-related risks. Neglected diseases exert heavy social and psychological burdens and are associated with social exclusion, reduced quality of life, and poor mental health (Hofstraat & van Brakel, 2016).

4. Discussion and Conclusions

Luis' experience and understanding of climate change, health, and migration provides a helpful case for considering how the nuances of climate-health risks can be flattened and made invisible in the context of everyday humanitarian documentation practices. As Luis' case illustrates, people navigate non-linear and recursive migration journeys made up of failed attempts, forestalled and repeated journeys, and interlinked structures of governance. Like many of the people we interviewed, Luis had migrated before. Initially displaced by hurricane Mitch in 1998, he migrated first to Houston where he worked in construction for several years. In 2005, he became part of a large Honduran migrant workforce that contributed to the rebuilding of New Orleans in the wake of Hurricane Katrina (Barrios, 2017). His experience speaks to what Deniz Daser (2023) refers to as transnational, layered, and cumulative stressors that members of the Central American diaspora experience. Indeed, while we have singled out cases that speak directly to particular social determinants of health, many of the people we interviewed discussed

how intersecting climate change variables in turn impact health risks. In other words, heat, rainfall variability, storm intensity, and deforestation are interrelated climate processes that can have complex and at times unexpected impacts on health, violence, and political persecution, and other migration pressures (A1 and A2).

By comparing migrant's responses to routine intake protocols and in-depth interviews, we have shown that climate-health risks as complex drivers of forced displacement may remain largely invisible in the context of everyday humanitarian practice along migrant routes through Mexico. Findings show that migrants rarely volunteer climatic disruptions and health as related drivers of forced displacement in the context of shelter intake interviews, and that individuals who do *not* see migration as being shaped by climatic disruptions may be the exception. Findings also show that overlapping climatic disruptions and related health risks shape conceptualizations of forced displacement pressures in a variety of different ways. Our findings illustrate that climate-health risks were front of mind for nearly all interviewees, and yet this was almost never documented in the context of shelter intake protocols.

This study reflects data from a relatively small sample of people, almost entirely men, from diverse geographic origins, recruited primarily through convenience sampling over the course of one month at a single migrant shelter in Central Mexico. Our data is made up of migrants' perceptions of the relationship between climate-health risks and migration pressures, though we have shown that, in general, interviewee's perceptions align with findings from existing scholarship on climate-health risks in Central America. The data do not speak to the strength of correlation between climatic processes, health risks, and migration trajectories, or whether interviewees migrated primarily for one reason or another. This study also does not systematically answer *why* people who access migrant shelters do not volunteer information

about climate impacts in the context of intake protocols, whether from the perspective of migrants or aid workers. What people accessing and working within shelters make of this discrepancy, what to do about it, and what the consequences of doing so might be—intended or otherwise—are the focus of our ongoing fieldwork.

More than mere limitations, these qualifications illuminate some of the stakes of generating knowledge about how climate-health risks are made known and to what ends within migrant shelters. Nongovernmental migrant shelters negotiate the constraints of humanitarian legal regimes that revolve around identifying and evidencing identity-driven violence and persecution (Burrell & Moodie, 2015; Osuna, 2020; Wolf, 2017; Zilberg, 2011). Scholarship on migration from Central America in particular has tended to focus on the ways that normative categories of legitimate victimhood and particular evidentiary standards established by these legal frameworks put shelter workers in a position of distinguishing between deserving and undeserving forms of suffering (Frank-Vitale, 2022; Heidbrink, 2022; Rosas, 2019). These analyses are important to consider in light of ongoing advocacy efforts to formally recognize climate-related displacement within international protection frameworks (Sussman, 2023; The White House, 2021). The legal precedent established by the case of Ioane Teitiota, who fled his home island of Kiribati due to rising sea levels in Micronesia, may work to unsettle the existing binary between economic migrants and victims of interpersonal persecution that is reproduced in the context of everyday aid work (Bergova, 2021; Bhardwaj, 2021). In 2020, his appeal for stay of deportation from New Zealand to his home island of Kiribati was granted by the UN Human Rights Committee. However, changes resulting from the legal institutionalization of "climate refugees" may also be relatively superficial to the extent that shifting the conditions for

recognition does not change the underlying biopolitics of deservingness that defines the existing asylum system (Munoz, 2021).

With these concerns in mind, this paper should not be taken as a call to simply add additional and better questions about climate change and health as factors driving displacement to existing shelter intake protocols, nor to presume that increasing the visibility of these factors will necessarily lead to improved outcomes for marginalized populations navigating forced displacement. As Parry and colleagues suggest (2019), benefits associated with rendering climate-health risks more visible to governing bodies and governmentalized organizations like migrant shelters do not necessarily outweigh the potential costs. Our findings do, however, speak to the importance of considering these tensions of (in)visibility in transit spaces like La Casita and how they might shape the ways that climate-related displacement is made known, obscured, and governed.

References

Alpízar, F., Saborío-Rodríguez, M., Martínez-Rodríguez, M. R., Viguera, B., Vignola, R., Capitán, T., & Harvey, C. A. (2020). Determinants of food insecurity among smallholder farmer households in Central America: Recurrent versus extreme weather-driven events. *Regional Environmental Change*, *20*(1), 22. https://doi.org/10.1007/s10113-020-01592-y

Amnesty International. (2020). *UN landmark case for people displaced by climate change*. https://www.amnesty.org/en/latest/news/2020/01/un-landmark-case-for-people-displaced-by-climate-change/

Angulo-Pasel, C. (2022). Rethinking the space of the migrant shelter in Mexico: Humanitarian and security implications in the practices of bordering. *Identities*, *29*(6), 730–747. https://doi.org/10.1080/1070289X.2022.2029068

Barrios, R. E. (2017). *Governing Affect: Neoliberalism and Disaster Reconstruction*. U of Nebraska Press.

Basok, T., & Rojas Wiesner, M. L. (2017). Winning a battle, losing the war: Migrant rights advocacy and its "influence" on the Mexican state. *Canadian Journal of Latin American and Caribbean Studies*, *42*(1), 17–35. https://doi.org/10.1080/08263663.2017.1281941

Bast, H. E., & Jenkins, J. L. (2018). Challenges to Prehospital Care in Honduras. *Prehospital and Disaster Medicine*, *33*(6), 637–639. https://doi.org/10.1017/S1049023X1800081X

Bergova, I. (2021). Environmental Migration and Asylum: Ioane Teitiota v. New Zealand. *Justice System Journal*, *42*(2), 222–224. https://doi.org/10.1080/0098261X.2021.1994796

Bermeo, S., & Leblang, D. (2021). *Climate, violence, and Honduran migration to the United States*. Brookings. https://www.brookings.edu/blog/future-development/2021/04/01/climate-violence-and-honduran-migration-to-the-united-states/

Bettini, G. (2013). Climate Barbarians at the Gate? A critique of apocalyptic narratives on 'climate refugees.' *Geoforum*, *45*, 63–72. https://doi.org/10.1016/j.geoforum.2012.09.009

Bhardwaj, C. (2021). Ioane Teitiota v New Zealand (advance unedited version), CCPR/C/127/D/2728/2016, UN Human Rights Committee (HRC), 7 January 2020.

Environmental Law Review, *23*(3), 263–271. https://doi.org/10.1177/14614529211039469

Boas, I., Wiegel, H., Farbotko, C., Warner, J., & Sheller, M. (2022). Climate mobilities: Migration, im/mobilities and mobility regimes in a changing climate. *Journal of Ethnic and Migration Studies*, *0*(0), 1–15. https://doi.org/10.1080/1369183X.2022.2066264

Bolaños Guerra, B. (2018). Biopolíticas del cambio climático ara Centroamerica. *Trace*, *74*, 135–158.

Borg, F. H., Greibe Andersen, J., Karekezi, C., Yonga, G., Furu, P., Kallestrup, P., & Kraef, C. (2021). Climate change and health in urban informal settlements in low- and middle-income countries – a scoping review of health impacts and adaptation strategies. *Global Health Action*, *14*(1), 1908064. https://doi.org/10.1080/16549716.2021.1908064

Bouroncle, C., Imbach, P., Rodríguez-Sánchez, B., Medellín, C., Martinez-Valle, A., & Läderach, P. (2017). Mapping climate change adaptive capacity and vulnerability of smallholder agricultural livelihoods in Central America: Ranking and descriptive approaches to support adaptation strategies. *Climatic Change*, *141*(1), 123–137. https://doi.org/10.1007/s10584-016-1792-0

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, *9*, 3–26. https://doi.org/10.1037/qup0000196

Brigden, N. (2017). Gender mobility: Survival plays and performing Central American migration in passage. *Mobilities*, *13*(1), 111–125. https://doi.org/10.1080/17450101.2017.1292056

Brigden, N. (2018). *The Migrant Passage: Clandestine Journeys from Central America*. Cornell University Press.

Burgard, S. A., & Chen, P. V. (2014). Challenges of health measurement in studies of health disparities. *Social Science & Medicine*, *106*, 143–150. https://doi.org/10.1016/j.socscimed.2014.01.045

Burrell, J. L., & Moodie, E. (2015). The Post–Cold War Anthropology of Central America. *Annual Review of Anthropology*, *44*(1), 381–400. https://doi.org/10.1146/annurev-anthro-102214-014101

Cerón, A., Ruano, A. L., Sánchez, S., Chew, A. S., Díaz, D., Hernández, A., & Flores, W. (2016). Abuse and discrimination towards indigenous people in public health care facilities: Experiences from rural Guatemala. *International Journal for Equity in Health*, *15*(1), Article 1. https://doi.org/10.1186/s12939-016-0367-z

Daser, D. (2023). The Insecure Migrant: Honduran Migration to New Orleans and the Rationalization of Risk. *Conflict and Society*, *9*(1), 21–36. https://doi.org/10.3167/arcs.2023.090102

de Haas, H. (2020). *Climate Refugees: The Fabrication of a Migration Threat*. International Migration Institute. https://www.migrationinstitute.org/blog/climate-refugees-the-fabrication-of-a-migration-threat

Dodd, W., Gómez Cerna, M., Orellena, P., Humphries, S., Sadoine, M. L., Zombré, D., Zinszer, K., Kipp, A., & Cole, D. C. (2020). Factors Associated with Seasonal Food Insecurity among Small-Scale Subsistence Farming Households in Rural Honduras. *International Journal of Environmental Research and Public Health*, *17*(3), Article 3. https://doi.org/10.3390/ijerph17030706

Donatti, C. I., Harvey, C. A., Martinez-Rodriguez, M. R., Vignola, R., & Rodriguez, C. M. (2019). Vulnerability of smallholder farmers to climate change in Central America and Mexico: Current knowledge and research gaps. *Climate and Development*, *11*(3), 264–286. https://doi.org/10.1080/17565529.2018.1442796

Draper, J. (2024). Climate change and displacement: Towards a pluralist approach. *European Journal of Political Theory*, *23*(1), 44–64. https://doi.org/10.1177/14748851221093446

Eckstein, D., Künzel, V., & Schäfer, L. (2021). *Global Climate Risk Index 2021*. Germanwatch. https://germanwatch.org/en/19777

Fash, B. C. (2022). Redefining extractivism from Honduras. *Geoforum*, *135*, 37–48. https://doi.org/10.1016/j.geoforum.2022.07.010

Frank-Vitale, A. (2022). Particular Social Group Trouble: Producing Categories of "Unworthy" Asylum Seekers. *Annals of Anthropological Practice*, *46*(1), 95–98. https://doi.org/10.1111/napa.12181

Frank-Vitale, A., Vogt, W., & Balaguera, M. (2019, September 6). AMLO's Political Prisoners: Mexico's Move to Criminalize Accompaniment and Solidarity with Migrants in Transit [Blog]. *Border Criminologies*. https://www.law.ox.ac.uk/research-subject-groups/centre-criminology/centreborder-criminologies/blog/2019/09/amlos-political

Fuerte Celis, M. del, Bolaños Guerra, B., & Olivera Villarroel, S. M. (2024). La sequía: El mal silencioso de la migración centroamericana en el periodo 1990 a 2019. *Estudios Fronterizos*, *25*, 1.

Fullman, N., Yearwood, J., Abay, S. M., Abbafati, C., Abd-Allah, F., Abdela, J., Abdelalim, A., Abebe, Z., Abebo, T. A., Aboyans, V., Abraha, H. N., Abreu, D. M. X., Abu-Raddad, L. J., Adane, A. A., Adedoyin, R. A., Adetokunboh, O., Adhikari, T. B., Afarideh, M., Afshin, A., … Lozano, R. (2018). Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: A systematic analysis from the Global Burden of Disease Study 2016. *The Lancet*, *391*(10136), 2236–2271. https://doi.org/10.1016/S0140-6736(18)30994-2

Galemba, R., Dingeman, K., DeVries, K., & Servin, Y. (2019). Paradoxes of Protection: Compassionate Repression at the Mexico–Guatemala Border. *Journal on Migration and Human Security*, *7*(3), 62–78. https://doi.org/10.1177/2331502419862239

Gouritin, A. (2022). *Migrantes climáticos en México*. FLACSO Mexico.

Guest, G., & MacQueen, K. M. (Eds.). (2008). *Handbook for Team-Based Qualitative Research*. AltaMira Press.

Hamlin, R. (2021). *Crossing: How We Label and React to People on the Move*. Stanford University Press.

Hardoy, J., & Pandiella, G. (2009). Urban poverty and vulnerability to climate change in Latin America. *Environment and Urbanization*, *21*(1), 203–224. https://doi.org/10.1177/0956247809103019

Headey, D., & Palloni, G. (2019). Water, Sanitation, and Child Health: Evidence From Subnational Panel Data in 59 Countries. *Demography*, *56*(2), 729–752. https://doi.org/10.1007/s13524-019-00760-y

Heidbrink, L. (2019). The Coercive Power of Debt: Migration and Deportation of Guatemalan Indigenous Youth. *The Journal of Latin American and Caribbean Anthropology*, *24*(1), 263–281. https://doi.org/10.1111/jlca.12385

Heidbrink, L. (2022). Enabling or Subverting Legal Violence? Expert Witnesses in Immigration Proceedings. *Annals of Anthropological Practice*, *46*(1), 80–82. https://doi.org/10.1111/napa.12177

Hernández-Albújar, Y., & Sánchez-Carrasco, A. (2023). A gender perspective of climate change perceptions and the intention to migrate in Copán. *Sexuality, Gender & Policy*, *n/a*(n/a). https://doi.org/10.1002/sgp2.12082

Hess, J. (2023). Heat and health inequity: Acting on determinants of health to promote heat justice. *Nature Reviews Nephrology*, *19*(3), Article 3. https://doi.org/10.1038/s41581-023-00679-z

Hiraide, L. A. (2023). Climate refugees: A useful concept? Towards an alternative vocabulary of ecological displacement. *Politics*, *43*(2), 267–282. https://doi.org/10.1177/02633957221077257

Hofstraat, K., & van Brakel, W. H. (2016). Social stigma towards neglected tropical diseases: A systematic review. *International Health*, *8*(suppl_1), i53–i70. https://doi.org/10.1093/inthealth/ihv071

Hunter, L. M., Luna, J. K., & Norton, R. M. (2015). Environmental Dimensions of Migration. *Annual Review of Sociology*, *41*(1), 377–397. https://doi.org/10.1146/annurev-soc-073014-112223

IOM. (2019). *World Migration Report 2020*. International Organization for Migration. https://publications.iom.int/books/world-migration-report-2020

Jawo, T. O., Kyereh, D., & Lojka, B. (2023). The impact of climate change on coffee production of small farmers and their adaptation strategies: A review. *Climate and Development*, *15*(2), 93–109. https://doi.org/10.1080/17565529.2022.2057906

Keller, M., Zamudio, A. N., Bizikova, L., Sosa, A. R., & Gough, A. M. (2018). Food security and climate change from a systems perspective: Community case studies from Honduras. *Climate and Development*, *10*(8), 742–754. https://doi.org/10.1080/17565529.2018.1447901

Knutson, T., Chung, M., Vecchi, G., Sun, J., Hsieh, T.-L., & Smith, A. (2021). *Climate change is probably increasing the intensity of tropical cyclones*. University of East Anglia. https://doi.org/10.5281/ZENODO.4570334

Leal Filho, W., Azeiteiro, U. M., & Alves, F. (2016). Climate Change and Health: An Overview of the Issues and Needs. In W. Leal Filho, U. M. Azeiteiro, & F. Alves (Eds.), *Climate Change and Health: Improving Resilience and Reducing Risks* (pp. 1–11). Springer International Publishing. https://doi.org/10.1007/978-3-319-24660-4_1

Mapulanga, A. M., & Naito, H. (2019). Effect of deforestation on access to clean drinking water. *Proceedings of the National Academy of Sciences*, *116*(17), 8249–8254. https://doi.org/10.1073/pnas.1814970116

McMichael, C. (2020). Human mobility, climate change, and health: Unpacking the connections. *The Lancet Planetary Health*, *4*(6), e217–e218. https://doi.org/10.1016/S2542-5196(20)30125-X

Meadows, J., Mansour, A., Gatto, M. R., Li, A., Howard, A., & Bentley, R. (2024). Mental illness and increased vulnerability to negative health effects from extreme heat events: A systematic review. *Psychiatry Research*, *332*, 115678. https://doi.org/10.1016/j.psychres.2023.115678

Missirian, A., & Schlenker, W. (2017). Asylum applications respond to temperature fluctuations. *Science*, *358*(6370), 1610–1614. https://doi.org/10.1126/science.aao0432

Munoz, S. M. (2021). Environmental Mobility in a Polarized World: Questioning the Pertinence of the "Climate Refugee" Label for Pacific Islanders. *Journal of International Migration and Integration*, *22*(4), 1271–1284. https://doi.org/10.1007/s12134-020-00799-6

Ortiz, D. I., Piche-Ovares, M., Romero-Vega, L. M., Wagman, J., & Troyo, A. (2022). The Impact of Deforestation, Urbanization, and Changing Land Use Patterns on the Ecology of Mosquito and Tick-Borne Diseases in Central America. *Insects*, *13*(1), Article 1. https://doi.org/10.3390/insects13010020

Osuna, S. (2020). Transnational moral panic: Neoliberalism and the spectre of MS-13. *Race & Class*, *61*(4), 1–26. https://doi.org/10.1177/0306396820904304

Pacheco-Vega, R., & Parizeau, K. (2018). Doubly Engaged Ethnography: Opportunities and Challenges When Working With Vulnerable Communities. *International Journal of Qualitative Methods*, *17*(1), 1609406918790653. https://doi.org/10.1177/1609406918790653

Patz, J. A., Grabow, M. L., & Limaye, V. S. (2014). When It Rains, It Pours: Future Climate Extremes and Health. *Annals of Global Health*, *80*(4), 332–344. https://doi.org/10.1016/j.aogh.2014.09.007

Pons, D. (2021). *Climate Extremes, Food Insecurity, and Migration in Central America: A Complicated Nexus*. Migration Policy Institute. https://reliefweb.int/report/guatemala/climate-extremes-food-insecurity-and-migration-central-america-complicated-nexus

Reichman, D. R. (2022). Putting climate-induced migration in context: The case of Honduran migration to the USA. *Regional Environmental Change*, *22*(3), 91. https://doi.org/10.1007/s10113-022-01946-8

Reyer, C. P. O., Adams, S., Albrecht, T., Baarsch, F., Boit, A., Canales Trujillo, N., Cartsburg, M., Coumou, D., Eden, A., Fernandes, E., Langerwisch, F., Marcus, R., Mengel, M., Mira-Salama, D., Perette, M., Pereznieto, P., Rammig, A., Reinhardt, J., Robinson, A., … Thonicke, K. (2017). Climate change impacts in Latin America and the Caribbean and their implications for development. *Regional Environmental Change*, *17*(6), 1601–1621. https://doi.org/10.1007/s10113-015-0854-6

Romero-Lankao, P., Hughes, S., Qin, H., Hardoy, J., Rosas-Huerta, A., Borquez, R., & Lampis, A. (2014). Scale, urban risk and adaptation capacity in neighborhoods of Latin American cities. *Habitat International*, *42*, 224–235. https://doi.org/10.1016/j.habitatint.2013.12.008

Rosas, G. (2019). Necro-subjection: On Borders, Asylum, and Making Dead to Let Live. *Theory & Event*, *22*(2), 303–324.

Schutte, S., Vestby, J., Carling, J., & Buhaug, H. (2021). Climatic conditions are weak predictors of asylum migration. *Nature Communications*, *12*(1), 2067. https://doi.org/10.1038/s41467-021-22255-4

Scott, J. C. (2009). *The art of not being governed an anarchist history of upland Southeast Asia*. Yale University Press.

Semenza, J. C., Rocklöv, J., & Ebi, K. L. (2022). Climate Change and Cascading Risks from Infectious Disease. *Infectious Diseases and Therapy*, *11*(4), 1371–1390. https://doi.org/10.1007/s40121-022-00647-3

Servan-Mori, E., Leyva-Flores, R., Xibille, C. I., Torres-Pereda, P., & Garcia-Cerde, R. (2014). Migrants Suffering Violence While in Transit Through Mexico: Factors Associated with the Decision to Continue or Turn Back. *Journal of Immigrant and Minority Health*, *16*(1), 53–59. https://doi.org/10.1007/s10903-012-9759-3

Stoesslé, P., & Gonzalez-Salazar, F. (2021). Right to health for undocumented migrants in Mexico: From theory to practice in the context of the health system reform. *International Journal of Migration, Health and Social Care*, *18*(1), 31–50. https://doi.org/10.1108/IJMHSC-03-2020-0028

Sussman, C. M. (2023). *A Global Migration Framework Under Water: How Can the International Community Protect Climate Refugees?* (SSRN Scholarly Paper 4425657). https://papers.ssrn.com/abstract=4425657

Tellman, B., Sesnie, S. E., Magliocca, N. R., Nielsen, E. A., Devine, J. A., McSweeney, K., Jain, M., Wrathall, D. J., Dávila, A., Benessaiah, K., & Aguilar-Gonzalez, B. (2020). Illicit Drivers of

Land Use Change: Narcotrafficking and Forest Loss in Central America. *Global Environmental Change*, *63*, 102092. https://doi.org/10.1016/j.gloenvcha.2020.102092

The White House. (2021). *Report on the Impact of Climate Change on Migration*. https://www.whitehouse.gov/wp-content/uploads/2021/10/Report-on-the-Impact-of-Climate-Change-on-Migration.pdf

Turner, N. J., Gregory, R., Brooks, C., Failing, L., & Satterfield, T. (2008). From Invisibility to Transparency: Identifying the Implications. *Ecology and Society*, *13*(2). https://www.jstor.org/stable/26267989

Valdez Vasquez, M. C., Chen, C.-F., Lin, Y.-J., Kuo, Y.-C., Chen, Y.-Y., Medina, D., & Diaz, K. (2020). Characterizing spatial patterns of pine bark beetle outbreaks during the dry and rainy season's in Honduras with the aid of geographic information systems and remote sensing data. *Forest Ecology and Management*, *467*, 118162. https://doi.org/10.1016/j.foreco.2020.118162

Varela Huerta, A. (2019). México, de 'Frontera Vertical' a 'País Tapón:' Migrantes, Deportados, Retornados, Desplazados Internos y Solicitantes de Asilo en México. *Iberoforum*, *27*(enero-junio 2019), 49–76.

Vicedo-Cabrera, A. M., Scovronick, N., Sera, F., Royé, D., Schneider, R., Tobias, A., Astrom, C., Guo, Y., Honda, Y., Hondula, D. M., Abrutzky, R., Tong, S., Coelho, M. de S. Z. S., Saldiva, P. H. N., Lavigne, E., Correa, P. M., Ortega, N. V., Kan, H., Osorio, S., … Gasparrini, A. (2021). The burden of heat-related mortality attributable to recent human-induced climate change. *Nature Climate Change*, *11*(6), Article 6. https://doi.org/10.1038/s41558-021-01058-x

Vogt, W. (2018). *Lives in Transit: Violence and Intimacy on the Migrant Journey*. University of California Press.

Watts, N., Adger, W. N., Agnolucci, P., Blackstock, J., Byass, P., Cai, W., Chaytor, S., Colbourn, T., Collins, M., Cooper, A., Cox, P. M., Depledge, J., Drummond, P., Ekins, P., Galaz, V., Grace, D., Graham, H., Grubb, M., Haines, A., … Costello, A. (2015). Health and climate change: Policy responses to protect public health. *The Lancet*, *386*(10006), 1861–1914. https://doi.org/10.1016/S0140-6736(15)60854-6

Wolf, S. (2017). *Mano Dura: The Politics of Gang Control in El Salvador*. University of Texas Press.

Wolf, S. (2021). Talking to Migrants: Invisibility, Vulnerability, and Protection. *Geopolitics*, *26*(1), 1–22. https://doi.org/10.1080/14650045.2020.1764540

Zilberg, E. (2011). *Space of Detention: The Making of a Transnational Gang Crisis Between Los Angeles and San Salvador*. Duke University Press.