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The Impacts of Warming Coffee:

The Climate Change-Coffee-Migration Nexus in the Northern Triangle of Central America

Connor Lynch

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Abstract

As climate change continues to threaten every corner of the world, one of the key features of the 21st century is migration, as a response to the myriad of effects related to a warming planet. This paper seeks to analyze the role of climate change as a motive for migration. The climate change-migration nexus is illustrated in this paper by revealing how slow-onset effects of climate change jeopardize the production of coffee in the Northern Triangle of Central America (NTCA), a region that is particularly vulnerable to the many effects. Thousands of people who depend on coffee production around Guatemala, Honduras, and El Salvador have already seen their livelihoods destroyed and consequently were forced to move. The future is uncertain with the rising temperatures in the region and millions more are employed by the industry.

This project accomplishes the analysis through a review of the climate change-migration nexus at large including in the discussion the complexity of other push factors leading to movement in the NTCA, followed by an account of the impacts of climate change on coffee production in the region. The design of this project incorporates an array of primary and secondary sources which include various government reports and academic papers in conjuncture with interviews conducted with experts around Geneva Switzerland from the Global Migration Center, the Internal Displacement Monitoring Center, and a world-renowned multinational coffee merchant, Sucafina.

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Introduction

Climate change is one of the largest existential challenges for humanity in the 21st century. According to the latest IPCC report (2018), humans have greatly contributed to an estimated 1 degree Celsius (1.8 degrees F) of temperature increase worldwide, above pre-industrial levels. The panel has identified various trends of consequences including rising sea levels and extreme weather patterns among many others. They also warn that there is significantly higher risk for droughts and precipitation deficits, if the temperature reaches 2 degrees Celsius of warming (p. 6-9). In addition, there are not as many cold nights which can have lasting consequences on agricultural production.

Understanding the link between climate change and migration is a complex task, and as time goes on and greater numbers of people see their lives altered, the relationship will become more apparent. The topic of this study is the climate change – migration nexus, specifically in the context of the Northern Triangle Countries of Central America (NTCA), namely Guatemala, Honduras, and El Salvador. This region is experiencing intense effects of climate change, despite their relatively small contribution to overall root causes like carbon emissions, compared to other regions, whose citizens may not experience these effects with equal intensity due to geographic location, or high levels of infrastructure.

In the NTCA, violence is often characterized as the major cause for “caravans” of people to head to the U.S. for safety. However, representing migration within and out of the region as a response to violence is certainly not the whole picture. This study will identify the complexity and interconnectedness of the many factors that contribute to the movement of people in this

specific region while focusing on the role climate change has in relation to the notably high levels of migration.

Within the NTCA, coffee production was selected as a case study to illustrate how slow-onset climate change leads to migration. Certain communities, where coffee production is important, have been wiped out as a result of disease and drought exacerbated by warming temperatures. Thousands of livelihoods have been destroyed, giving people no choice but to move someone else. In light of this, there are a few ways that coffee farmers are being assisted, however, those who are on the move for reasons beyond their control have little support and no chance for protection under international refugee law.

Literature Review

There are many different approaches taken by experts from a variety of disciplines in the research of the climate change-migration nexus. Much of this literature discusses the difficulty in making a direct link between climate change and the movement of people, because of the myriad of other drivers that may seem more apparent than climate change. For example, It's much easier to show the relationship between armed conflict and migration. Literature shows that migration related to climate change is sparked by sudden-onset disasters like hurricanes that drive people from their origin, or more slow-onset abnormalities, such as unusually intense or unprecedented droughts and rising temperatures that threatening agriculture. Scholars tend to analyze both qualitative and quantitative data. Many pursue regional case studies as examples of how climate change has affected specific populations in order to contribute to the broad study of the climate change-migration nexus. A great deal of studies tend to focus on how specific consequences of climate change exacerbate other, more frequently identified drivers of the movement. This

literature rarely discusses slow onset effects of climate change as major factors of migration.

(Faist & Schade, 2013; Falco, Donzelli & Olper, 2018; Eklund, Romankiewicz, Brandt, Doevenspeck, Samimi, 2016).

Specifically looking at literature on displacement and migration in the NTCA, much of this is heavily focused on factors like gang violence, extreme poverty, and bad governance all working together to drive people to the act of moving. Climate Change is either briefly mentioned or absent altogether in these studies. Few scholars focus on climate change related factors in this region, and even less look at one agricultural industry, such as coffee, in attempts to bridge the gap between climate change and migration. Experts who focus on the Northern Triangle region make mention of the difficulty in finding reliable numbers indicating where people moved and for what specific reasons. (E. Rushing, Personal Communication, April 2, 2019; Knox, 2018).

Lastly, many sources mention that there is a lack of attention given to people who have moved because of climate change, particularly in international law. However, some scholars suggest that that the perception of security is changing, and with this, the law will adapt to encompass those who are in need of protection internationally because climate change has made it impossible to return to their places of origin (UNHCR, 2000; Barnett, 2007).

Research Methodology

A regional approach that was taken to exhibit how climate change contributes to the movement of people. Coffee production in the NTCA is the case study employed to make this connection. In order to understand the connection between coffee and migration, the project included a review of the climate change-migration nexus, a focus on movement in the NTCA,

and a brief survey of how climate change affects this region. Primary sources included interviews of experts from the Global Migration Center, Internal Displacement Monitoring Center, and an International Coffee Merchant, Sucafina. Other references of primary sources included statistical data collected from the U.S. Department of Agriculture, International Coffee Organization, and the International Organization for Migration. The secondary sources included scholarly articles from social sciences and humanities, as well as reports from governments and non-governmental organizations.

There were basic ethical considerations with conducting interviews. To address these considerations, a human subjects review form was filled out and was approved by the School for International Training. In addition, before each interview, the interviewees were thoroughly informed of the purpose of the project, as well as their rights as participants in the form of a written informed consent document, which each participant signed.

Definitions and The Analytical Framework

When studying the complex subject of human migration, it's very common to come across many different terms such as migrant, immigrant, refugee, asylum seeker, and internally displaced person. The terms displacement and migration are differentiated amongst academic literature and by the IDMC. The IDMC works mostly with internal displacement, which refers to the forced movement of people within the country they live in. Bina Desai from the IDMC during her interview discussed the differentiation of the terms, she mentioned one school of thought that argues for the use of the term "migration" to encompass all movement of people, and applies the "forced", or "voluntary" labels depending on the situation described. However, she warns that it is important not to conceptually mix "migration", which is a healthy and

positive concept, with forced displacement, which is negative, and should be avoided (B. Desai, personal communication, April 11, 2019).

While it is important to understand these distinctions, there are conflicting uses of the terminology throughout literature and civil society. This project recognizes that the movement of people can be both healthy and unhealthy but does not want to limit its scope to any one categorization of movement. Rather, it intends to highlight the massive scale of populations that are on the move, in response to, or having some relation to climate change, regardless of what degree of choice these people were considered to have in the matter, where they moved, or what legal status they were given. For the sake of consistency, and to apply to the widest range of people, the broad term “migration” was used throughout the analysis.

Climate Change, Coffee, and Migration

Climate Change-Migration Nexus

The climate change-migration nexus can be approached from a variety of angles and is studied across disciplines. Climate change and migration have a multi-dimensional relationship. The link can be direct; for example, sudden extreme weather events or sea level rise have given people no choice but to move somewhere else to survive permanently or temporarily. The link can also be more indirect when the drivers of migration are amplified by the effects of climate change. For example, long term droughts with unprecedented intensity result in decreased agricultural production, causing widespread economic issues, poverty, and weak governance. In turn, this creates a social environment which allows for the violence that pushes people from their land in search for personal security.

Around the world, the numbers of people moving, for whatever reason is on the rise. It is generally difficult to make the link between climate change as the direct cause of migration due

to the complexity of situations. However, in 2017 alone, according to the IOM, 18.8 million people in 135 countries were displaced because of sudden-onset disasters in their countries (Vidal, Tjaden, & Laczko, 2018, p. 19). Environmental change and natural disasters have always been notable drivers of migration. The IOM predicts in their MECC report, that even more people are expected to be on the move because of weather related disasters in the 21st century (International Organization for Migration, 2014, p. 5). These disasters include intense floods and storms that are known to be caused or amplified by climate change, and have tripled in the last 30 years, impacting most dramatically the developing world (IOM, 2009).

Since environmentally caused migration is such a multidimensional concept, the terms often used to describe this type of migration have not been consistent. Thomas Faist and Jeanette Schade (2013) discuss the difficulty in defining the terms by showing how the debate went from the usage of “environmental refugee” in the mid 1980’s as it developed to encompass all those who had been displaced from their traditional habitat due to environmental disruption that impacts quality of life. This term and the term “climate refugee” were used by the UNEP, the IPCC, and around the debate amongst the international community. Eventually, Faist and shade go on to explain, use of the term “refugee”, when referring to those who were forced to leave their homes due to environmental causes, became highly debated and rejected by the UN. By the time the fourth IPCC report came around, the term refugee was absent altogether. Instead, the terms used in the international debate included “ecological migrants, or “climate-related migration”. They conclude with an observation that these terms are used in quotations in the literature, suggesting that they are still ambiguous (pp. 6-7).

Climate change is touching every corner of the world, but not equally. The IOM report on the indicators of migration in 2018 references that small island developing states continue to be

disproportionately impacted by natural disasters, but that slow-onset processes such as droughts or sea level rise also increase people's mobility worldwide, however, quality data is lacking in this particular area (p. 44). Nations and particular communities that are heavily dependent on agriculture, as well as island nations are particularly vulnerable to climate change that leads to both internal and transnational migration.

Northern Triangle of Central America

The Countries of the NTCA, namely El Salvador, Guatemala, and Honduras are particularly vulnerable to climate change, due to being located in a semi-arid region known as the "Dry-Corridor" and because they have significant agricultural industries. The people in these countries are subject to both the growing intensity of sudden, and natural disasters, as well as the many long-term difficulties associated with the slow-onset processes. Migration from the NTCA has been a popular phenomenon covered in media outlets and academic literature.

Today, according to the IOM, heading north to the United States or Canada as final destinations is a key feature of migration from Latin America and the Caribbean for many reasons. Movement from Mexico to the United States is the largest (transnational) migration corridor in the world (International Organization for Migration, 2017, pp. 75-77). Many people taking this route originally come from Central America. On page 79 of this IOM report, the authors call Mexico a "transit country", referring to the number of migrants from regions like the Northern Triangle that pass through the diverse country on their journeys to the United States or Canada. Significant migration in this corridor is not new. Regarding historical flows from both Mexico and Central America, one can see a steady increase in migration starting in 1970 that continues well into the 2000's (Rosenblum & Brick, 2011, p. 4).

In terms of irregular migration flows in the region, “in 2014, and again in 2016, apprehensions of Central Americans originating from the “Northern Triangle” region of Guatemala, Honduras and El Salvador exceeded that of Mexicans at the United States–Mexico border” (International Organization for Migration, 2017, p. 78). They later emphasize that the United States received over 250 percent more asylum claims from the Northern Triangle countries in 2015 compared to 2013 (p 81). These countries share some common political, economic, and social characteristics as well as issues such as poverty and gang violence. They also produce similar agricultural products.

In the context of migration in the NTCA, there are a number of driving factors that contribute to movement, including economic, social and political as well as the less documented environmental factors. In Honduras, drivers include entrenched and increasing poverty, food insecurity, inequality, crime, violence, and the militarization of the state (Knox V. , 2019, p. 13). Honduras has a history of authoritarian regimes and political repression (p.14). In their thematic report on Guatemala, the IDMC shows how the Guatemalan people have experienced a long history of displacement that increases at times like the civil war that lasted from 1960 until 1996 which caused many people to move elsewhere, whether internally or across the border. They also consider other economic, political, and social factors. (Millard & Lara-Florian, 2018, pp. 14-16). Lastly, the people of El Salvador have a long history of migration in many forms. During their civil war from 1979-1992, about a quarter of the population was on the move, mainly in rural areas (Knox V. , 2018 , p. 13).

Although there are many factors, it’s nearly impossible to isolate just one of the mentioned characteristics as a single driving reason for why someone decided to leave their home temporarily or permanently. When a family moves to escape gang violence in their town, it

is not simply the violence that they are fleeing. Their situation includes a variety of other social and economic factors that may not seem like the immediate or dominant driver of the migration but have also significantly contributed to the call to leave. The violence may be just the tipping point, or the trigger of the migration, intertwined with numerous and compounding other factors.

The Challenges to Understanding Climate Change in the Migration Story of NTCA

In the media, literature, and even international law, consequences of climate change that motivate internal and transnational migration tend to be overshadowed by violence related to armed conflict or gangs as the driving factor of migration. This poses a challenge to making the climate change-migration nexus in the NTCA. The numerous threats to people's livelihoods linked to climate change in the region of the northern triangle prove to be important considerations when seeking to understand the complexity of the movement. Many academics consider it rather difficult to make a direct link between climate change and migration for a number of reasons including the many other underlying, and well-known factors sparking the movement.

When looking specifically at climate change in the region, it is difficult to measure the effects within countries because "climate is not spatially homogenous within a country and neither are climate anomalies" (Eklund, Romankiewicz, Brandt, Doevenspeck, & Samimi, 2016, p. 144). One community could be devastated, while another in the same country is untouched, even within the relatively smaller Northern Triangle countries. Analyzing macro-level data for a country undeniably misses important regional details that could uncover a massive amount of people on the move. Therefore, by looking at estimated migration totals, it's important to consider the regional differences and their contributions to these numbers.

Another challenge when making the connection is the fact that data is scarce in the NTCA region when looking for specific patterns and reasons for migrating. Elizabeth Rushing, head of a recent research project for the IDMC on displacement in the NTCA, spoke about this uncertainty in the data in this region. She gave the example of Honduras being the only country that keeps official numbers of internal movement. She notes that the last figures they have from Guatemala are from 1997, and in El Salvador they are based off of a national survey that isn't reliable. Even though it's difficult to quantify the link between climate change and the numbers of people moving due of the lack of data, she says that its undoubtedly linked to the root causes of displacement in the region. When asked to describe the relationship between climate change and violence, factors of migration in the region, she suggests that climate change exacerbates violence. (E. Rushing, personal communication, April 2, 2019).

Falco, Donzelli, & Olper use the same word "exacerbate", to describe how climate vulnerability underlies other elements that contribute to decisions to migrate. They suggest that climate change is a key factor leading to the migration push, particularly where agriculture is the main source of income and employment in a region because this sector is generally the most sensitive to climate variations (p. 2).

To address the lack of data in terms migration, particularly within a country, as well as to help bridge the gap between climate change and the movement of people, the IDMC is undertaking a project called "no matter of choice: displacement in a changing climate". The head of the project, Bina Desai, was interviewed. She shared many ways in which data is being collected, including through the usage of global information systems and satellite imagery to show where people have gone inside the country, as well as the tracking of mobile phones and information sharing from Facebook. The IDMC's aim is to utilize this kind of technology to

produce more accurate and specific numbers around the world. (B. Desai, personal communication, April 11, 2019).

Climate Change in the NTCA

Climate change has transformed the NTCA region in a number of different ways over the years and has been linked to changing weather patterns, intensified storms, and droughts. Even though the dry corridor where the NTCA is situated is historically arid, since 2014, the land has experienced higher numbers and increasing intensity of droughts. According to the IPCC report, agriculture in Latin America and Caribbean is dependent on rain-fed systems for both sustenance and export crops, therefore, it's particularly vulnerable to rising temperatures, lack of rainfall, and precipitation patterns (WBG, 2019).

Honduras is considered one of the most at-risk countries from a climate change perspective, and has experienced a number of extreme weather events from 1997-2006 attributed to climate change (Knox V. , 2019, p. 13). El Salvador is subject to extreme weather and climate change impacts that have already caused sporadic and acute movements and are projected to be worse in the future (Knox V. , 2018 , p. 13). Lastly, Guatemala has also historically experienced threats from the environment, like Hurricane Stan in 2005, and was characterized by the US FAO as being particularly vulnerable to climate change. (FAO, 2012).

In addition to sudden extreme weather, slow-onset effects in the region have included droughts, ocean level rise, and climbing temperatures which impact agricultural production. Agriculture is a sector that cannot be overlooked for its contributions to the regional economy of the NTCA. The sector “employs 30-40% of the economically active population” (Baca, Läderach, Hagggar, Schroth & Ovalle, 2014, p. 1). With such high dependency on agriculture for sustenance and exports, climate change is particularly threatening to the population's stability. A

similarity within the agricultural industries amongst countries in the NTCA is the importance of coffee as an export crop.

Coffee and Climate Change

Coffee is one of the most traded commodities in the world and is one of the top exports in the economies of the NTCA. Across Mexico and Central America, “over 4 million people depend directly on coffee production for their livelihood” and the industry employs an estimated 8.5 million people. (Baca, Läderach, Hagggar, Schroth & Ovalle, 2014, p. 1). However, climate change is increasingly challenging the production of coffee world-wide, and particularly in the Central America.

The coffee plant is delicate and is carefully grown in specific regions of the world in two main varieties: Arabica and Robusta. Arabica makes up 70% of world-wide coffee market and Robusta (and a few lesser known varieties) make up the rest (Hagggar & Schepp, 2012, p. 4). The Arabica coffee bean is known for being a higher quality, more aromatic bean than Robusta. Companies and shops around the world advertise the usage of 100% Arabica beans when applicable. These beans are mostly grown in tropical highlands, and generally at higher elevations than Robusta. Both plants are threatened by climate change, but the more popular Arabica is even more sensitive to the warming temperatures and variable weather patterns. Hagggar and Schepp conducted a study on the effects of climate change on coffee production around the world in 2012. They found that temperature and rainfall are really important in the potential coffee yield (p. 3) They show that “mean temperatures above 23°C (73°F) hinder the development and ripening of cherries” and that “a continuous exposure to daily temperatures as high as 30°C (86° F) could result in reduced growth or even a yellowing and loss of leaves” (p.

3). The delicate production of coffee is undeniably at risk around the world with rising temperatures and irregular weather patterns.

Another threat to coffee production world-wide and particularly in Central America is the disease known as Coffee Leaf Rust (CLR). This fungus has decimated coffee crops around the world and has been present in the NTCA region since 1970's (Ward, Gonthier, & Nicholls, 2017, p. 1083). It starts by turning the leaves bright yellow, then black, while reducing the amount of cherries produced. The trees then usually die within 2 years. Warming climates are expected to increase the intensity of CLR (Bhutia, Lotha, & Petruzzello, 2018). The Robusta variety has proven to be more resilient to the disease, but the more popular Arabica plants are severely impacted as rising temperatures allow for the disease to be spread more easily. Arabica coffee has made it's way on to the endangered list of the IUCN, which notes that known threats are result of climate change, including habitat shifting, droughts, and temperature rise (Moat, O'Sullivan, Gole, & Davis, 2018).

Challenges to Coffee Production in NTCA

In Central America, as noted by Haggard and Schepp, most parts of the region are predicted to experience an increase in mean annual temperature between 1-2 degrees Celsius until 2050. They warn that since dry seasons are expected to be even dryer because of reduced precipitation, growing conditions for the Arabica plant will deteriorate in the region. They also importantly mention that "higher temperatures improve living conditions for pests and diseases. Increasing pest attacks lead to the loss of quality of the coffee beans or even to the destruction of yield and plants" (P. 8). This makes Arabica production, which is the most commonly grown coffee in the NTCA region, especially at risk of challenges like CLR.

Ward, Gonthier, and Nichols (2017), in their study on coffee rust in Honduras, elaborate on the connection between climate change and the coffee rust disease. On pages 1082-1083, they make the point that climate change plays an increasingly important role in the spread of pathogens to coffee. They show alarming numbers of coffee yields, after a coffee rust epidemic in 2011. It infected 80,000 Ha of land in Honduras alone, that was estimated to wipe out roughly half of the harvests for 30,000 farmers, and completely wipe out over 10,000 more farmers' harvests (p. 1082).

The 2018 USDA reports on coffee production in the NTCA all make mention of CLR. The Guatemalan report shows that coffee production in Guatemala decreased six percent, just from 2017 to 2018. Their coffee industry is continuing to recover from an outbreak of the disease in 2012, that decimated 20% of the production (Tay, 2018, p. 2). In Guatemala, according to the same report, "The fragile cost structure and depressed prices of coffee in Guatemala represents a significant risk for the whole coffee sector." (p.3) Small and medium sized famers cannot be competitive at the current prices and are likely to consider migrating.

The USDA report on Honduras shows that coffee production is down 2% from the 2016/17 into the 2018/19 harvest cycles, and that a new strand of coffee rust was found in a type of Arabica coffee plant that was designed to be resistant to the rust. Coffee is grown in 15 out of the 18 departments in their economy and almost all of the farmers are small to medium sized (Gomez, 2018, p. 2). The report also mentions on the same page that coffee production is going to decrease because of rising costs as a result of coffee rust disease. Since most producers are smaller and do not have access to credit since they are still in debt from the 2012 outbreak, they cannot invest in projects to combat the problems associated with the changing climate. These people, like their neighbors in Guatemala, are also likely to consider moving.

Lastly, the USDA report on El Salvador's coffee shows that production is projected to increase in the 2018/19 harvest. However, the major decline in production in the past as a result of the rust led to significant job loss in the coffee sector that continues impact employment in rural areas. Over last five seasons, jobs have dropped from 86,500 to an estimated 45,000 for the 2017/18 crop. (Herrera, 2018, p. 2).

Overall, throughout the region, data from the International Coffee Organization shows that from 1990 – 2000, El Salvador exported on average 2,220,900, 60kg bags of coffee each year, then saw a decrease in coffee exports over the next couple of decades and in 2017, coffee exports are down to 506,000 of the same bags (International Coffee Organization , 2018). Honduras and Guatemala, on the other hand, have experienced, an average increase of coffee exports over the last three decades, yet one can see major drops in exports around 2012, during the infamous CLR outbreak (p. 3).

Increases and decreases in overall export numbers, however, do not reflect how climate change has impacted specific coffee growing regions, since climate does not affect a country homogeneously. Some regions are more successful than others. The areas in El Salvador that are becoming less suitable for coffee production due to lack of rainfall and rising temperatures are “Sam Miguel and Usulután, while the department of Achuchapan will maintain high suitability” (Baca, et al., 2014 p. 5). This research also suggests that the greatest loss of suitability in Guatemala “will be the southern slope of the Pacific volcanic chain, northern Zacapa and Eastern Chiquimula, while Chimaltenango will maintain high suitability” (p .7).

The way coffee is grown throughout the three countries is mostly by small farmers. For example, 97% of coffee producers in Guatemala are considered small farmers, the majority owning on average 1.2 Ha of land. (Tay, 2018, pp. 2-3). 104,416 out of 105,171 coffee producers

in Honduras were considered small to medium producers. (Gomez, 2018, p. 2). Since the land used for coffee production is divided amongst such a large number of farmers in the NTCA, when CLR, rising temperatures, and droughts lower production in an area, many more people are directly impacted in comparison to large-scale farming in the United States, where the average farm size in 2012 was 434 Acres (176 Ha) (United States Department of Agriculture , 2012, p. 2).

Small farmers who depend on coffee are extraordinarily sensitive to climate change. As profitable as the industry is, the thousands of people in coffee producing areas remain the poorest and most vulnerable to market and climate shocks. (Eakin, Tucker, & Castellanos, 2005, p. 1). Small farmers are not able to recover quickly, and the problems begin to compound, well beyond the loss of suitability for the next year's harvest. In El Salvador, "jobs continue to disappear in coffee producing areas resulting in migration to urban areas...In addition, the abandonment of coffee farms has increased, depriving the country of its main source of forestation and water retention, a much-needed benefit of coffee production" (Herrera, 2018, p. 6).

In the NPR story "Rust Devastates Guatemala's Prime Coffee Crop and its Farmers" (2014), reporter Carrie Khan interviewed a farmer in the town of Olopa in northern Guatemala, close to the Honduran border. Edwin Fernando Diaz Viera's entire coffee crop was destroyed by the disease in 2012 which, in his words: "wiped the whole place clean". Kahn concluded:

Humanitarian organizations insist that the current flood of immigrants out of Central America is not a product of coffee-rust-induced unemployment, but ask around Olopa by the Honduran border, and you'll get a different answer. One farmer estimated that a third of the tiny town's residents are in the U.S. (p. 1)

Coffee rust and rising temperatures do not simply stop at the human-drawn boundaries. It's clear that there is a decline of Arabica production across the border from Olopa throughout Honduras between the years 2012-2014; exports went from 5.6 million bags in 2011/12 harvests, down to 4.7 million bags the following year and 4.4 million in 2014 (United States Department of Agriculture, 2015, pp. 6-8). This was because of a combination of factors, but most notably, the outbreak of CLR aggravated by rising temperatures.

Dave Behrends, head of trading for SUCAFINA, one of the leading coffee trading houses in the world, that operates in every step of the coffee production process, was interviewed. He was asked questions regarding coffee production around the world and in the northern triangle region. One of the biggest concerns that he expressed was how the changes in the climate and lower coffee prices will cause farmers to cut back on preventative measures to combat rust and other threats. He predicted that the region should expect to see many more outbreaks of CLR in the next 12-24 months, than were experienced in the past 6-8 years. (D. Behrends, Personal Communication, April 12, 2019). When cases of CLR increase, this could mean the end for more coffee dependent communities.

Coffee and Migration

There are a couple of different ways to approach the coffee-migration nexus. The loss of this important crop can act as both the direct trigger of the movement of people, as well as an amplifier of other drivers like violence. When the communities that are dependent on coffee production, like Olopa, Guatemala lose this source of income, the people have little choice but to move, either within the country, or across the border. Bina Desai from the IDMC suggested in her interview that the tipping point that causes people to move is very different in small enterprises (like coffee farms) where people depend on each other and the community for

support and workers. Therefore, when one family moves, the community must undergo a difficult restructuring process, which can lead to further migration (Bina Desai, Personal Communication, April 11, 2019).

Dave Behrends suggested that if one were to examine Guatemala for example, where coffee is grown at high altitudes, they may find villages that are completely wiped out because of rising temperatures at these previously suitable altitudes and see expansion of production at higher ones. He gives the example of Prime Wash coffee variety that was grown at lower altitudes when he first started working in the coffee industry (2001). It no longer exists today (D. Behrends, Personal Communication, April 12, 2019). As farms climb in altitude, surface area to grow the coffee decreases. In this case, and around the world, climate change is the culprit that has forced people to move their farms, or to leave the industry all together.

Another approach to the coffee-migration nexus is examining how the loss of coffee production contributes to other drivers of movement. Losing an important cash crop contributes to poverty and vulnerability in certain areas which exacerbates other drivers such as gang violence in the NTCA region. As previously cited literature and the two experts from the IDMC point out, this exacerbating effect is the most commonly discussed relationship between climate change and migration. It's important to remember that particularly in the context of the NTCA, there are a number of factors contributing to pushing people from their origins.

Whether the loss of agricultural production is seen as the driver itself, or the amplifier of other aspects that lead to the exodus of coffee producers, there is certainly a relationship between climate change and movement of people that can be illustrated by the story of coffee production in the NTCA. Although there are obstacles to finding accurate numbers of internal movement, consulting external migration data can help to identify trends that are useful in analyzing

correlations between climate change and migration. The Pew Research Center show that the number of immigrants entering the US from the NTCA rose 25% between 2007 and 2015 (Cohn, Passel, & Gonzalez-Barrera, 2017, p. 11).

On page 5 of this report, a chart shows that the number of new immigrant arrivals nearly doubled between 2011 and 2014. Of course, there are many compounding factors contributing to this movement, but coffee has certainly played a role in recent “waves” or “caravans”, of people headed to the United States from the NTCA, as well as unmeasurable amounts of displacement inside the country due to falling prices and the 2012 CLR outbreak. International coffee prices paid to growers in 2011 were \$1.87 per pound in El Salvador, \$2.12 per pound in Guatemala, and \$2 a pound in Honduras. They dropped to \$0.95, \$1.27, and \$1.02 per pound respectively by 2013 (International Coffee Organization, 2018). In a recent *Time* news article, *Why are so many migrants leaving Guatemala. A crisis in the industry is one reason*, Quetzaltenango, located in the western highlands of Guatemala, is regarded as a region with one of the highest rates for outward migration in the country because of lack of jobs and low salaries in the coffee industry (Leutert, 2018). This is related to both the reduction of price and the destruction of coffee farms linked to climate change.

There will be a significant increase in internal and external migration of people who depend on coffee production in the NTCA in the coming years. Another outbreak of coffee leaf rust is projected to attack the region because the plants have lost their resistance and temperatures are on the rise. The diminishing of agriculture will not only lead to further migration and displacement, but also has the capability of contributing to further violence and exacerbating other drivers of migration.

Global Response to Climate Change-Coffee Migrants

The threat to the coffee industry is not a secret. There are a number of efforts being taken in the region that are aimed to help sustainable production of coffee, and to help mitigate the loss due to droughts and outbreaks of CLR. Sucafina, Catholic Relief Services, and a number of other organizations are involved with supporting farmers and coffee growing communities through education and investments in preventative measures to help combat the rising temperatures. However, for the numbers of people who have seen their livelihoods destroyed by CLR or drought that was amplified by climate change, that have had little choice but to set out for a new way of life, assistance is sparse.

The 1951 refugee convention, the foundation of international refugee law, does not recognize climate change as a factor for which people should be granted refugee status. Therefore, people from coffee-dependent communities in the NTCA who are on the move cannot seek refugee status. This refugee law was written after the second world war and reflects more of a traditional notion of security. Those deemed worthy of protection under international law are typically under the threat of human persecution. This is evident in the 1951 convention that encompasses those “persecuted for reasons of race, religion, nationality, membership of a particular social group or public opinion...” ((UNHCR), 2000, p. 14). Protection does not apply to people experiencing environmental threats. There are however arguments that this perception of security is changing to encompass those who have been forcibly displaced from their homes because of climate change. John Barnett argues for the recognition of “environmental security” and explores the ways in which environmental change fits into the many concepts of security. (Barnett, 2007).

Climate change, however, is not absent from the international legal discussions. Vincent Chetail, director of the Global Migration Center in Geneva, was interviewed and argued that even though people on the move because of climate factors are not included in international law, they are present in many regional definitions as needing protection, such as the African convention of 1969 or the 1984 Latin American convention, even though the UN does not accept a label such as “Climate Refugees” (V. Chetail, Personal Communication, April 1, 2019).

In addition to these regional recognitions that climate change can pose security challenges that are eligible for protection, the UN and global migration group’s “Principles and Guidelines, supported by practical guidance, on the human rights protection of migrants in vulnerable situation” makes the point that where people lack protection under refugee law, they are in need of protection of by international human rights law. They include natural disasters, climate change, and environmental degradation on their list when identifying drivers that cause people to be unwilling or unable to return to their country of origin (OHCHR, Global Migration Group, 2018, p. 6).

In regard to NTCA migration in response to the environment, the United States has granted temporary protected status in some cases of specific disastrous environmental events, such as hurricane Mitch in 1998 (Puscas, 2018, p. 3) or earthquakes in 2001 (Knox V. , 2018 , p. 14). Even though people on the move because of slow-onset effects of climate change remain relatively unprotected, the environment is increasingly being recognized as a driving factor of human movement that is worthy of protection by international law as well as individual government laws in response to both sudden disasters, and slow-onset effects of climate change.

Conclusion

Migration and temperatures are projected to rise in the years to come. Climate change and migration have a complex, multidimensional relationship. The many effects of climate change do not alter the world equally, and regions like the NTCA experience the consequences with extraordinary intensity. Therefore, it's important to take a regional approach when investigating the climate change-migration nexus.

Movement of people within the NTCA and across the borders, primarily to the north, is a major feature of migration trends in the 21st century. Migration in this region is complex and is most often a response to a number of different influences. Factors like violence and poverty tend to be regarded as the major causes of movement. However, it's important to consider the role of climate change when analyzing migration. Climate change triggers migration both directly, through agricultural destruction, and indirectly, by exacerbating the multitude of other drivers. Scholars, including the interviewees for this project, agree that the climate change-migration nexus must continue to be explored.

Future considerations for the study of the coffee-climate-migration nexus include showing how problems with coffee production contribute to specific types of violence or other drivers of migration in the region. Further studies utilizing some of the technology like satellite imagery to analyze the movement of people from specific coffee growing regions will deepen the understanding of the climate change-migration nexus, as well as help to predict the future of coffee production.

Stability in the NTCA is threatened by climate change particularly because of the economic importance of agriculture. Millions of people who depend on coffee in the region are seeing their livelihoods threatened by alarming rates of CLR and unprecedented droughts

attributed to climate change. Since coffee is mostly grown on small farms in the NTCA, massive amounts of people are impacted when climate change alters a relatively small area. Climate change in the coffee industry is a noteworthy contributor to the migration of people within and out of the region. Although there are a number of efforts taken by investors and organizations to mitigate some of the effects of climate change in coffee producing communities in the NTCA, people already forced leave the industry and consequently their homes, struggle with their next steps. Even if the loss of their livelihood is recognized as a direct result of climate change, they lack protection under international law. However, as time goes on and numbers of people impacted continue to climb, climate change will be considered a security threat that is worthy of protection under international law, encompassing those who have seen their communities destroyed by slow-onset effects of climate change.

Abbreviations List

CLR: Coffee Leaf Rust

CBP: Customs and Border Protection

ICO: International Coffee Organization

IDMC: Internal Displacement Monitoring Center

IOM: International Organization for Migration

MECC: Department of Migration, Environment, and Climate Change (IOM)

MPI: Migration Policy Institute

NCTA: Northern Triangle of Central America (Guatemala, Honduras, El Salvador)

NPR: National Public Radio

USDA: United States Department of Agriculture

UNHCR: United Nations High Commissioner for Refugees

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