



A farmer works his drought-stricken cornfield in Guatemala.
(Photo courtesy of Conred/Guatemala.)

U.S.–MEXICO FUTURES FORUM

Fleeing the Storms

By Stephanie Leutert

In October 2017, Macario Macz Tení pulled the husks off the corn in Raxruhá, Santo Pedro Carchá, Guatemala, as several of his small children looked on. The corn crop that he had tended for months, which was meant to feed his family of eight for the next year, was ruined. Three days of torrential downpour had destroyed not just the Macz Tení family's crops, but also those of another 40 families who lived nearby. Wiping tears from his eyes, Macario told the news outlets that had come to document the flood that he had no choice now but to go find other work in order to provide his family with something to eat.

Increasingly erratic weather patterns have made scenes of ruined crops and shattered livelihoods a familiar sight across many parts of Central America. Longer periods without a drop of rain or days of seemingly endless precipitation are uprooting generations of Central Americans who work the land, sending them to find employment in different industries or new locales. Some of these workers will move to a neighboring town or city, and others will head north to the United States, following generations before them. It is a familiar story of the search for a better life, but now entangled with the rapidly emerging force of climate change.

International migration from Central America's Northern Triangle (Guatemala, El Salvador, and Honduras) dates back decades. In the 1980s, millions of Guatemalans and Salvadorans fled civil wars and ended up in makeshift refugee camps in Mexico or in rougher neighborhoods of the United States. The civil wars came to an end in the 1990s, but migration from the region did not. A new generation set out to follow in the footsteps of previous migrants, looking for better-paying jobs, escaping ongoing violence, or starting a new life after natural disasters. By 2000, the U.S. Census counted 817,336 foreign-born Salvadorans, 480,775 Guatemalans, and 283,000 Hondurans living across the United States.

Today, an estimated 200,000 to 300,000 Central Americans set out every year for the United States, attempting to join earlier generations of migrants. This latest group leaves their homes for an even longer list of reasons than in previous decades, including

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Photo by Globevision.

A young girl hauls away family possessions after a flood in Honduras.

to escape hunger, poverty, gang violence, extortion threats, domestic and family violence, ongoing political instability, or to reunify with a parent already living in the United States. The newest addition to this list is climate change, which acts both as a direct driving force and an exacerbating factor.

While Central America is feeling climate change's first consequences, it has barely contributed to the phenomenon. Guatemala, Honduras, and El Salvador's economies produce less than 1 percent of the world's greenhouse gases, and all three countries generate significant percentages of their electricity from renewable energy sources. Yet the three countries' geographic location in the tropics between the Atlantic and Pacific Oceans places them in one of the world's most vulnerable regions for climate change's effects. Climate models predict that by 2030, the region could see average temperatures rising by around 1 to 1.5 degrees Celsius and precipitation declining or becoming increasingly unpredictable.

Yet these changes are not a problem-in-waiting for some future generation. Central American countries are already enduring the impact of unconventional weather patterns, and subsistence farming families like the

Macz Tenís are on the front lines. The governments of El Salvador and Honduras report that temperatures have already risen by around 1 degree Celsius over the past 60 years, while Guatemala's government notes that some areas of the country have gotten 10 percent hotter in the last 20 years. These warmer temperatures are coupled with periods of intense drought, strong rainy seasons, and increasingly erratic weather patterns.

The infamous "El Niño" phenomenon — the heating of the Pacific Ocean surfaces that causes drier weather conditions — has triggered severe droughts across the region. While the whole region can be affected, the most high-risk areas run up the center and western portions of El Salvador, Honduras, Guatemala, and Nicaragua, making up what is referred to as the "dry corridor." The 10.5 million inhabitants of this corridor have timed their corn and bean cultivation around the zone's cyclical wet and dry seasons, but the rains have stopped arriving on schedule.

From 2014 through 2016, three consecutive droughts destroyed farmers' staple crops throughout the dry corridor. In 2014, the lack of rain wiped out 70 percent of Honduras's corn crops, 63 percent of Guatemala's bean production, and damaged crop cultivation in 30 percent of El Salvador's farmland. Yet this wasn't even the worst year.

The lack of rain in 2015 compounded the ongoing effects and was dubbed the region's worst drought in 30 years, with Central American governments and international aid organizations struggling to attend to devastated rural residents. Things didn't get any better in 2016, when the United Nations' Food and Agriculture Organization noted that 3.5 million people across the region were in dire need of humanitarian assistance.

Climate change most affects industries that rely on regular weather cycles, primarily agriculture but also ranching and fishing. Without rain, cattle don't have grass to eat or water to drink, and ranchers struggle to come up with the money and supplies to keep them alive. High temperatures and late rains can also dry up lakes and rivers. In the summer of 2017, these factors combined with upstream water deviations to dry out the Laguna de Atescatempa in southwest Guatemala. By the middle of last year, the only things that remained in the once-picturesque lagoon basin were beached fishing boats and local fisherman who were newly out of work. Over the following months, thunderstorms gradually refilled parts of the lake, but without changes in the underlying conditions, these waters — and local residents' jobs — are likely to disappear once more.

The dry landscape of Guatemala's Laguna de Atescatempa after shifts in the normal weather patterns.



Photo by Marvin Recinos/AFP/Getty Images.

El Niño droughts are often countered by "La Niña" floods. The heavy rains that characterize La Niña conditions — brought on by a cooling of the Pacific Ocean's surfaces — fill rivers and lakes beyond their capacity and send flash floods that wash away or submerge roads, bridges, homes, and farmland. Crops that were diligently tended for months can be underwater in hours. In January 2018, several days of intense rain in Guatemala pushed the Río Polochic over its banks, sending streams of muddy brown water through the surrounding communities. The village of El Estor reported that 344 families in the community had lost all their crops in the storm, and the residents were waiting in temporary shelters for the water to reside. It's far from an isolated event, with similar stories repeating themselves every year throughout the region.

Yet, even if Central America's farmers can withstand extreme droughts and floods, their crops are still vulnerable to the plagues spread by a changing climate. Devastating fungi are pushed across the region through a combination of warmer weather and intense rainy seasons. In 2013, a coffee rust fungus moved through the region's farmlands and reached higher elevations than ever before, paralyzing the industry and leading to more

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Photo by Carlos Manuel Cebalán Harroquín.

A father and his children plant corn on land vulnerable to mudslides.

than \$1 billion in losses. Coffee workers were also left without employment as large-scale plantations slimmed down their payrolls and smaller farms struggled to pay the bills, with an estimated 100,000 Central Americans ultimately losing their jobs.

While Central America is at risk for extreme weather events, the negative effects are not spread evenly throughout the population. The region's subsistence farmers, small-scale ranchers, and fishermen are on the front lines, but they are also the least prepared. They lack the resources to adapt to or mitigate weather risks through infrastructure or access to insurance markets. When the rains subside, these workers either rely on family networks or government assistance to make it through a bad season, send family members elsewhere to earn an alternative income, or suffer months of hunger.

The rotting corn crops or desiccated bean plants hurt rural communities the most, but families everywhere from Tegucigalpa to San Salvador to Guatemala City feel the impact. Market shortages on staple goods push up domestic prices, and all Central Americans — though particularly those with the lowest incomes — feel the pinch in their wallets. Tracking the prices of these goods over time confirms the economic theory. From 2014 to 2016, the prices of white corn, red beans, and sugar were all higher in Honduras than the previous five-year average, due to the

multi-year drought. Even if climate change doesn't wipe out their jobs, it makes all the region's consumers a little worse off.

While tracking international migration and documenting climate change can be straightforward, linking the two is not. Within the region, Central Americans may migrate domestically at least once before heading north, obscuring the direct link between weather and international migration. These migration patterns fall under broader patterns of increasing urbanization and may not be recorded or noticed since they follow regular migration routes to economic centers and do not cross international borders.

In Mexico or the United States, these individuals are also often categorized as economic migrants who left because of poverty or a lack of economic opportunities, further blurring the role that changing weather played in their expulsion. Also, since economic migrants do not qualify for any Mexican or U.S. protections — unlike those fleeing persecution by gangs or drug traffickers — they are often directly deported back to their countries of origin without a chance to share their complete stories.

Despite the difficulties in teasing out the connection, initial studies are beginning to recognize the extent to which migration and climate change are connected. In 2009, a U.S. National Intelligence Council report predicted

that climate change-induced weather events would push Central Americans out of the region along the same paths as previous migrants. A few years later, a 2015 World Food Programme survey linked migration to food insecurity caused by climate change, reporting that 12 percent of Guatemalans affected by the 2014 drought had a family member migrate within the previous month due to weather conditions, as did 10 percent of Hondurans and 5 percent of Salvadorans. Additional studies have also documented how Central America's droughts, hurricanes, and heat waves all create rural-to-urban migration, with droughts provoking the most human movement.

Targeted government and international programs could help mitigate climate change's negative effects. To date, each Central American country has outlined a plan for addressing climate change, and international organizations have funneled investment into resilience efforts. For example, local irrigation infrastructure could help make water more reliable during droughts, crop alternation or diversification could protect against weather variability or diseases, and targeted and timely emergency assistance would help communities to recover from extreme weather shocks. However, Central American governments' efforts to address climate change have so far been insufficient to fully support rural communities and

are likely to be overshadowed by other domestic priorities, such as boosting employment and reducing violence.

Today's climate change disruptions across Central America are just the beginning. As a global challenge, Central American countries can't address the issues on their own, and conditions are poised to get worse before getting better. Politicians in Washington, D.C., or other world capitals may not yet feel the effects, but rural Guatemalans, Hondurans, and Salvadorans are already living through them. The Macz Tení family is among thousands of Central Americans who will leave behind their ruined crops and head to a neighboring city or send family members north to the United States. The family's tradition of corn farming is now impossible because of unpredictable and extreme weather patterns, with climate change uprooting them from their land and sending them in search of a different life.

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References for this article are available at clas.berkeley.edu.

Three simultaneous hurricanes threaten Central America, September 2017.



Image from NOAA/Wikipedia.