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Latin America and
the challenge of
climate migration

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Summary

This working paper begins by discussing the complexities of climate migration, including its multi-causal nature and difficulties in attributing decisions to migrate solely to environmental factors. Current evidence on the impact of climate change in Latin America and the Caribbean is presented, with an emphasis on the differential impact by region of warmer temperatures, changing precipitation patterns and sea level rise. The particular vulnerabilities of specific population groups – including indigenous groups, women, children and people with disabilities – are discussed. Projections of potential climate migration in Latin America and the Caribbean are analyzed, including analysis of those who are unable or unwilling to migrate. The working paper then considers the potential impact of climate change on Colombia, noting the diverse environmental risks facing the country and the lack of published research on climate migration in particular.

Keywords

climate change; climate change adaptation; environmental risks; migration

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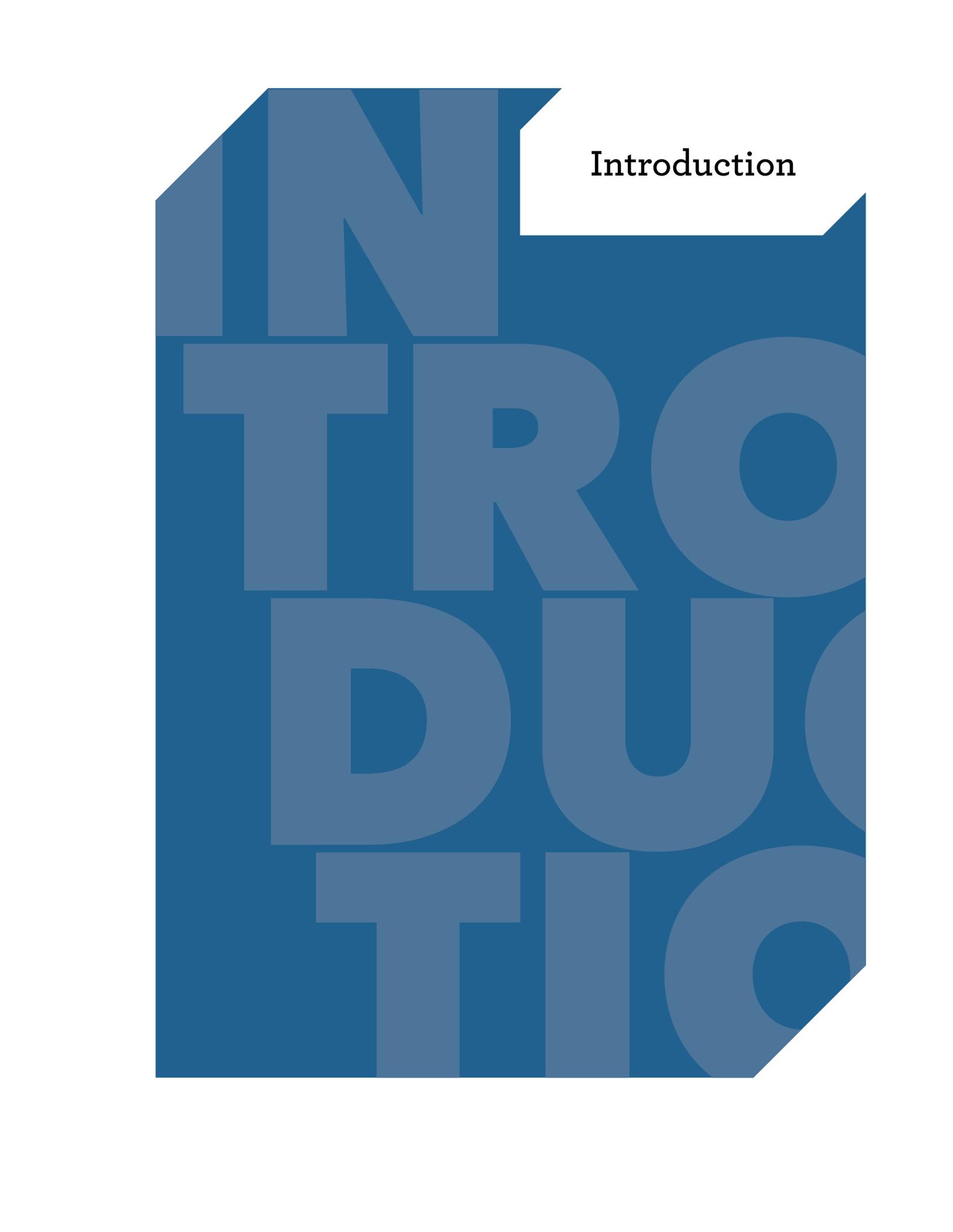
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List of abbreviations

Coamex	Coalición México por los Derechos de las Personas con Discapacidad
GDP	gross domestic product
IDMC	Internal Displacement Monitoring Centre
IDP	internally displaced persons
IFRC	International Federation of Red Cross
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
OCHA	Office for the Coordination of Humanitarian Affairs
UN	United Nations
UNDRR	UN Disaster Risk Reduction
UNFCCC	UN Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees
UNODC	United Nations Office on Drugs and Crime
WMO	World Meteorological Organization





Introduction

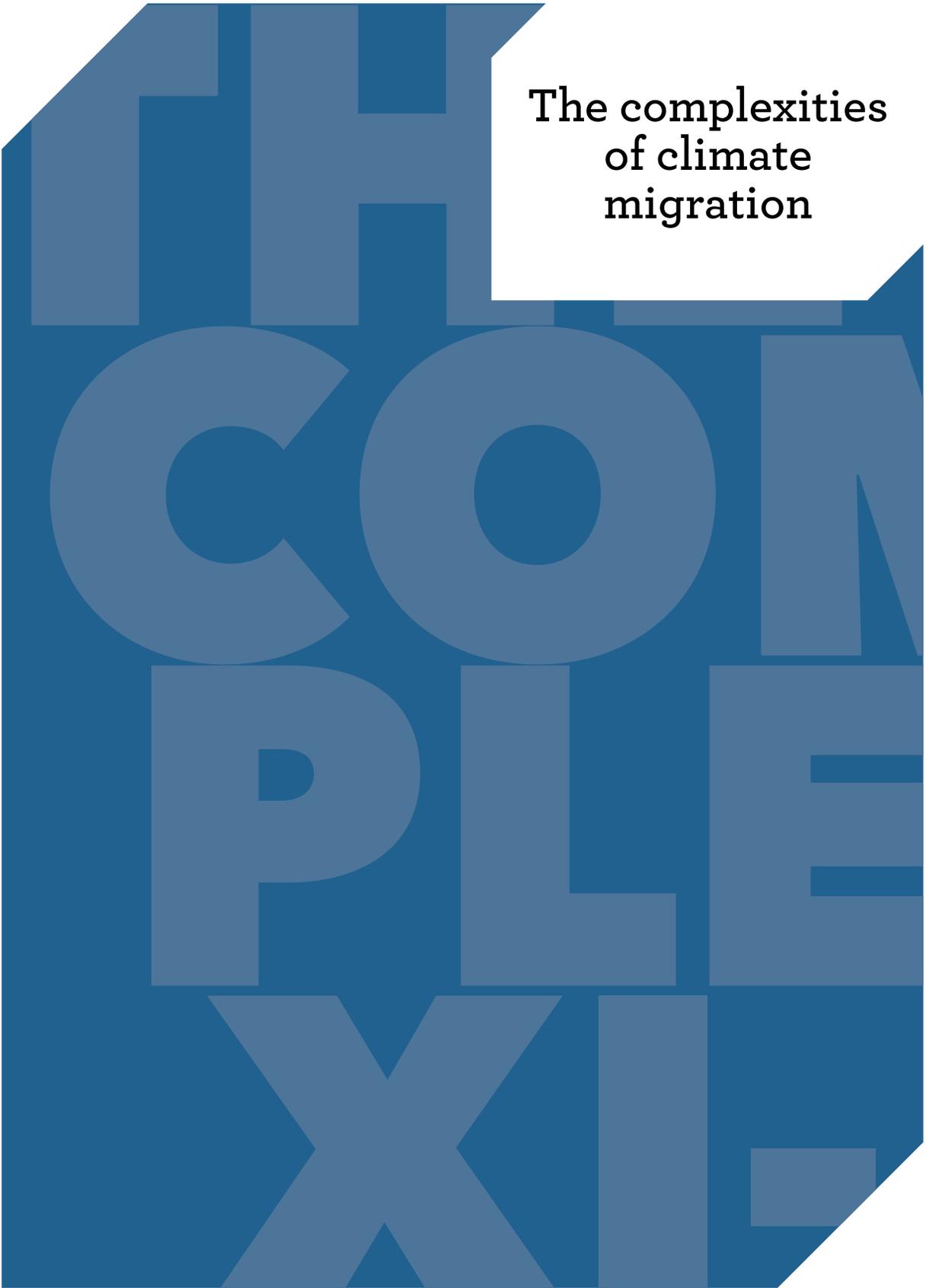
The very first report of the Intergovernmental Panel on Climate Change in 1990 identified migration to be one of the main consequences of human-induced climate change (IPCC, 1990). Since then, there has been growing interest in the subject with policy-makers and academics from many different disciplines exploring the likely impact of climate change on human mobility (United Kingdom, 2011; Rigaud et al., 2018; Clement et al., 2021; International Organization for Migration, n.d.). In the mainstream press, reporters have warned of large numbers of ‘climate refugees’ turning up on borders of high-income countries, playing on anti-immigration fears. In contrast, in the emerging field of climate justice, the concerns of low-income countries are central (Burkett, 2021) with governments of developing countries making the case that displacement due to

climate change is a tangible loss that deserves compensation (UNFCCC, 2018). All available evidence points to the likely fact that the negative effects of climate change will lead many people – probably millions of people – to move in the coming decades, affecting both low- and high-income countries (Rigaud et al., 2018; Clement et al., 2021).

Following a short introduction explaining some of the dilemmas of assessing the impact of climate change on migration, this article examines the evidence of climate change’s potential impact on human mobility in Latin America and the Caribbean and then focuses on the evidence on climate migration in Colombia. This introductory section is organized along the lines of what we know, what we don’t know, and what remains to be discovered about climate migration.¹ This is followed by a short explanation of the non-trivial issue of terminology.

¹ Parts of this section are drawn and updated from Ferris (2020).





The complexities
of climate
migration

What we know

Since the beginning of human existence, people have moved in response to environmental change. Indeed, the planet was settled by people moving in search of better environmental and economic conditions. Archaeologists tell us that civilizations rose and fell in response to changes in the environment; the mighty Maya civilization, for example, most likely collapsed because of long-term drought. The Bible is full of stories of people forced by famine to seek their futures in other territories. As Alejandro Grimson (2011) and later, Hein de Haas (2023), explain, migration is neither good nor bad in itself, it is simply a fact of human life and environmental hazards have always played a role in shaping migration patterns.

Human-induced climate change is occurring at a rapid pace, with temperatures rising globally as a result of carbon emissions with potentially catastrophic results for human existence as air and sea temperatures increase, leading to rising sea levels, melting of sea ice and permafrost in Arctic areas, increasing drought and desertification, growing intensity and frequency of sudden-onset weather-related disasters, changes in disease prevalence as vectors expand into new territories, increasing incidences of heat waves and wildfires and all of the economic, social and political consequences of these changes. While authors vary in their assessment of the severity of climate change's impacts (Lustgarten, 2024) the evidence is indisputable that human-induced climate change is occurring as evidenced in the increasing specificity of the IPCC's periodic reports (e.g. IPCC, 2022).

The negative effects of climate change will lead people to leave their communities and migration will take different forms. When people can

no longer survive where they are or when they perceive that conditions, including environmental conditions, are better elsewhere, they migrate. Both forced displacement and voluntary migration are time-tested survival strategies. This is a normal phenomenon and it is to be expected that people will make different choices about whether, when and where to move.

We know that climate change will always interact with other factors - socio-economic, demographic and political factors - in shaping decisions to migrate (United Kingdom, 2011; McAdam, 2012). Social and economic factors will play at least as important a role as environmental factors in shaping these decisions. People with resources may find it easier to invest in adaptation measures that will enable them to remain where they are but also may be more able to migrate - or migrate earlier - when environmental conditions deteriorate. People with fewer resources will likely suffer more from the effects of climate change but are also more often to lack the resources to move. People with family or community networks elsewhere will be more likely to move to those areas.

Migration, induced at least in part by climate change, will lead to different patterns of migration and displacement. This migration will occur - and is occurring - in both rich and poor countries. At least in many cases, people will move from affected rural areas to cities due to declines in agricultural productivity and loss of livelihoods, increasing the already high pace of urbanization.

We know that most climate change-induced migration will take place within the borders of a country (Rigaud et al., 2018; Clement et al., 2021). Although there has been disproportionate attention to the phenomenon of cross-border displacement, it seems likely that these international movements



will be concentrated in certain regions (such as the Pacific Islands) and in areas where there have traditionally been cross-border movements for economic reasons (e.g. Horn of Africa, Sahel). We know that much of the migration induced by climate change will follow routes and patterns of economic migration – both internally and cross-border.

Different environmental changes will likely produce different types of movements. Sudden-onset disasters (like typhoons) usually lead to sudden (but often temporary) displacement where the challenge for governments is usually to evacuate people safely and to quickly recover so that communities can return. Drought and sea-level rise will likely lead to more anticipatory displacement – some people in the community will leave before conditions become catastrophic, often through traditional economic migration pathways. Some people will likely be left behind, whether voluntarily or because they're simply unable to move. There have been some fascinating studies on the impact of climate change on pastoralists where instead of increasing mobility, drought increases sedentarization (Schrepfer & Catarina, 2014).

Specific demographic and social groups will be impacted differently. Although there are many exceptions, men are more likely to move than women, young people are more likely to migrate than older people, and healthy people are more likely to move than those with disabilities. The elderly and those with disabilities are more likely to remain in their communities – sometimes called 'trapped populations' (Black & Collyer, 2014). Indigenous and other marginalized communities may be more likely to choose to remain where they are, even when environmental conditions are severe (Farbotko, 2018), due to historic and often spiritual ties to the land. While much attention is focused on those who migrate, those who remain behind – either voluntarily or involuntarily – may be at far greater risk than those who move.

What we don't know

In a nutshell, there is little conclusive evidence on when, how, who, why, where, or how many people will move because of the negative effects of climate change.

>We don't know how many people will move. There are dozens of models of displacement associated with climate change, beginning with rather simplistic models predicting that for x meters of

sea level rise, Y number of people will move from coastal areas to presumably safer inland areas. These models, however, do not usually account for the way individuals make decisions or account for other adaptation strategies. Estimates have ranged from 50 million to a billion people moving as a result of climate change in the next thirty years (e.g. Kolmannskog, 2009; Gemenne, 2015; McAdam, 2012; Rigaud et al., 2018). Dire warnings of the potential for climate change to displace hundreds of millions of people have given way to a realization that the relationship between migration and climate change is a complex process influenced by factors that do not lend themselves well to estimates generated by statistical projections and models (United Kingdom, 2011).

In a widely-cited study, the World Bank in 2021 estimated that 216 million people will migrate internally due to the effects of climate change in six regions of the world (excluding Europe, North America and Middle East/North African countries) by 2050, but this was based on the most extreme of the scenarios of greenhouse gas emissions (Clement et al., 2021). If the countries of the world are able to reduce their emissions, develop green energy sources, and implement adaptation measures, the environmental pressures will be less – and it is likely that fewer, perhaps far fewer, people will make the decision to move.

>We don't know the extent to which climate change – rather than normal climatic variation – causes specific disasters. While we can say with some certainty that climate change is leading to more intense and less predictable extreme weather events (Merner, 2023), we haven't been able to say that a particular hurricane or drought is caused by climate change. Long before the effects of human-induced climate change were apparent, there were catastrophic droughts and storms. However, the scientific work on attribution is leading to more clarity about the relationship between sudden-onset disasters and climate change (Reed et al., 2020); for example, recent studies have found that between 30 and 50 percent of the 2019 Australian wildfires were due to climate change (Fountain, 2020).

>We don't know how climate change-induced displacement will affect the communities left behind, the receiving communities, the displaced themselves, local governments, and others. Attention to immobility was triggered in part by the Foresight's study's finding that trapped populations – those who are unable to move – may be more vulnerable than environmental migrants (United Kingdom, 2011).



Abebe (2014, p. 130) cites Blessing in that migration has a tendency to take away “the energetic, innovative, and educated young generation while leaving behind ‘the very young, the apathetic, the retired and the tired, the illiterate and the infirm.’” Others argue that migration may reduce the pressures in the communities of origin (Barbier, 2009). It may be, for example, that out-migration reduces pressure on scarce water resources and that the remaining community is better able to survive because of out-migration. Given the important role that remittances from economic migrants play in development (and in families’ survival), it may be that the remittances sent home by climate migrants enable families who remain behind to survive and even thrive.

>We don’t know whether those displaced by climate change have different needs than those displaced by violence or who migrate because of poverty. While it is clear that those who are displaced by sudden-onset weather disasters lose both material and human assets and are almost always poorer as a result of the displacement, the evidence is less clear for those who migrate voluntarily – often in anticipation of the effects of climate change. The evidence on the needs of climate migrants is fairly scanty although research in Bangladesh (Adri & Simon, 2017) found that ‘environmental migrants’ were typically worse off than traditional economic migrants. While these are difficult distinctions to draw, further research could shed some light on the particular needs and vulnerabilities of those who migrate because of environmental conditions.

>We don’t yet have a good picture of the gendered effects of climate change induced migration. Many studies indicate that men are more likely to move when drought occurs – usually to find alternative jobs in cities – with consequences for the women left behind (Penning-Roswell et al., 2013; Gray & Mueller, 2012). But there is also evidence that in some cases, such as the Philippines, women are more likely to migrate because they are likely to find more long-term jobs (Chandran, 2018). And in Peru, Bergmann (2024) found that both men and women migrate in response to changing environmental conditions, the men moving to rural areas to work in agriculture while women move to urban areas to work as domestic servants.

>We do not yet fully understand the impact of climate change on conflict or social cohesion. Some use the term ‘threat multiplier’ to indicate that environmental hazards can intensify the effects of poverty or be a catalyst for conflict. Although there

have been many large-scale quantitative studies looking at the relationship between environmental factors (such as rainfall or drought) and conflict, the results are inconclusive. Some studies of particular contexts have found that climate change contributes to conflict. Kelley et al. (2015) argue that the Syrian drought in 2006-2008 led agriculturalists to migrate to cities which increased pressure on the Assad regime which responded with heavy-handed tactics, provoking the conflict. Schwartzstein (2023) found that declining water in Iraqi marshes led to the loss of livelihoods; agriculturalists with no means of survival were then recruited into radical insurgent groups. Läderach et al. (2021) found that municipalities in Guatemala experiencing high levels of conflict were in areas that experienced drought. Similar results were found in Honduras. In more general studies that are not Central America-specific, researchers have suggested that disasters increase vulnerability and compound grievances, destroy coping mechanisms, create power vacuums that can lead to increased climate vulnerability and increase pressures on governance mechanisms.

>On the policy level, we haven’t yet figured out whether those displaced by climate change should receive preferential treatment from national governments and the international community over those forced from their homes by desperate poverty or non-climate-related hazards. Does someone displaced by a hurricane have more of a claim on resources than someone displaced by an earthquake or tsunami? This is the case made by the UN Special Rapporteur on Climate Change (2023), arguing that because the international community is responsible for the global warming that displaces people, the international community has a responsibility to support climate migrants to find new places to live. However, others reject this argument, arguing that it is difficult to make this distinction when considering the needs of those displaced.

Terminology

While there is general consensus that the term ‘climate refugee’ is inappropriate (the 1951 Refugee Convention has only five grounds for refugee status, none of which refers to either economic or environmental reasons for leaving), there is no consensus on terminology. Although imperfect, this paper uses the term ‘climate migrant’ to indicate those who move, at least in part because of human-induced changes in the environment. The

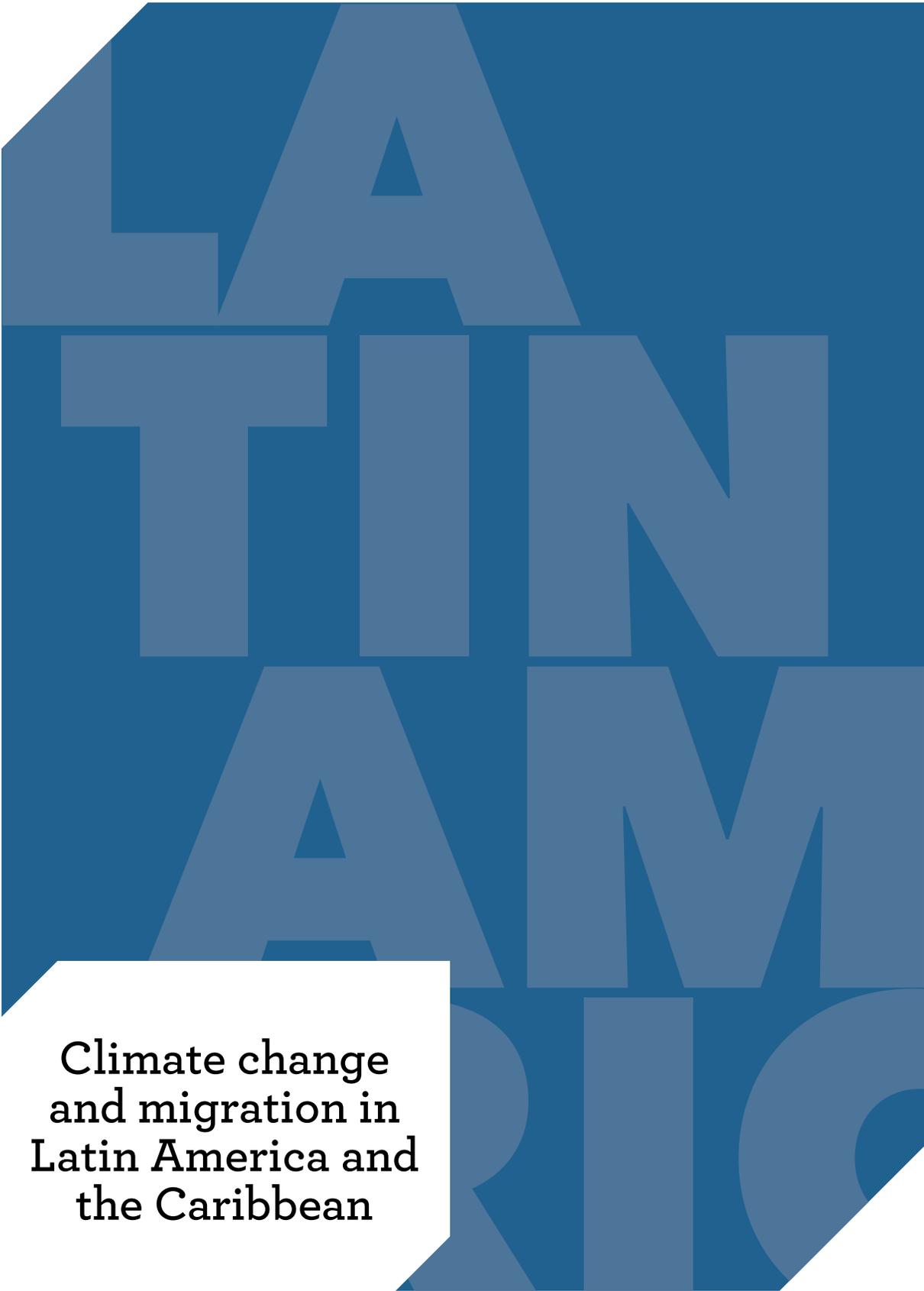


International Organization for Migration defines climate migration as “the movement of a person or groups of persons who, predominantly for reasons of sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or choose to do so, either temporarily or permanently, within a State or across an international border” (IOM, 2019, p. 31). This is a broad definition that encompasses virtually all forms of migration occurring in the context of climate change.

In 2010, the UNFCCC’s Conference of Parties identified three forms of human mobility associated with climate change: migration (assumed to be

voluntary), displacement (which is always involuntary) and planned relocations (when a whole community is relocated as a result of either a sudden-onset disaster or a slower-onset impact of climate change such as sea level rise) (UNFCCC, 2010). Even so, climate migrant is somewhat a misnomer in that few people move solely because of environmental hazards – rather mobility is multi-causal in nature. Given that this report focuses on the impact of climate change, population movements triggered by geophysical events are not included here although volcanic eruptions, earthquakes and tsunamis all have an impact on displacement globally and in Latin America and the Caribbean.





Climate change
and migration in
Latin America and
the Caribbean

Migration patterns in Latin America

Migration has always been central to Latin American and Caribbean development, from the impact of colonialism and the forced transport of millions of enslaved people to the region to long-standing seasonal internal migration within the region to several decades of robust migration from Latin America to the United States. In recent years, anti-immigrant sentiment in the United States coupled with restrictionist border policies has led to a surge in irregular arrivals and the growing importance of criminal smuggling networks (UNODC, n.d.). As most climate migration is expected to follow patterns of migration for economic, family reunification and other types of migration, this section presents a brief overview of migration patterns in the region.

Both internal and intra-regional migration in Latin America have been important strategies in response to economic and environmental conditions. Internally, Latin Americans have moved from rural areas to cities and indeed, Latin America is the most urbanized region in the world, with 80 percent of its population living in urban areas (UN Habitat, 2017). The percentage of the Caribbean population which is urban - now 72 percent - is expected to increase to 80 percent by 2050.

In addition to internal migration in the search for economic opportunities, there has also been significant internal displacement because of conflict and gang violence. By late 2021, UNHCR reported over 318,000 internally displaced persons in El Salvador and Honduras (UNHCR, 2021) and countries such as Peru and Guatemala have experienced large-scale internal displacement as a result of internal conflict. At the end of 2023, the Internal Displacement Monitoring Centre (2024) reported that there are 6.3 million people displaced internally

in Latin America due to conflict and violence (principally in Colombia and Haiti) and 50,000 displaced by disasters. There is a clear relationship between internal and cross-border displacement. Escamilla García (2021) found that youth in Central America often use domestic networks to move internally to escape labor exploitation and gang violence; when that doesn't provide safety, they turn to international migration. With respect to people moving, at least in part, because of the effects of climate change, we can expect similar patterns - people first relocating to other places in the country (and sometimes to multiple places) and only turning to international migration when they are unable to find economic security or stability.

Within Latin America, there is substantial intra-regional migration and well-established migration corridors, for example, between Guatemala-Mexico, Venezuela-Colombia, Peru-Paraguay-Argentina, Peru-Chile, Nicaragua-Costa Rica and others. Since 2014, large numbers of Venezuelans have migrated to neighboring countries; currently 6.7 million Venezuelans are living in other Latin American countries, almost 3 million in Colombia (Inter-Agency Coordination for Refugees and Migrants from Venezuela (R4V), 2023). In the Caribbean most intra-regional migration has been the result of disasters, mostly Haitians and Cubans moving as a result of storms.

About 60 percent of Latin American migrants move to North America, primarily to the United States. Historically, large numbers of Mexicans migrated to the U.S. in search of economic opportunities, facilitated at times by large-scale bilateral agreements for Mexican agricultural workers. This pattern began to change in the mid-2010s as increasing numbers of Central and South Americans traveling to the U.S. People have left their countries

of origin for multiple reasons: lack of economic opportunities, environmental hazards, a bulging youth population, poor governance and weak rule of law, corruption, lack of trust in the government, and significant gang violence as well as opportunities offered by growing diaspora networks

Central Americans have surpassed the number of Mexican immigrants to the U.S., and in fact, the number of Mexican immigrants returning to Mexico now exceeds Mexican immigration to the U.S. Since 2014, when large numbers of unaccompanied Central American children began arriving in the U.S., there has been a notable shift away from single male migrants to family units or children and teenagers traveling on their own.

In the last few years, the number of migrants seeking to cross the U.S.-Mexico has diversified with Mexico reporting the arrival of migrants from over 110 countries, almost all of whom were seeking to transit Mexico with the goal of crossing into the United States (Putzel-Kavanaguh & Ruiz Soto, 2023). Over 500,000 migrants crossed the treacherous Darien Gap in 2023; while the majority come from Venezuela, the number of Africans, Asians, Middle Easterners and Europeans has skyrocketed (Yates & Pappier, 2023). As the effects of climate change become more evident in these countries, it is likely that those moving because of environmental hazards will choose to follow these migration pathways.

What do these migration patterns suggest about likely climate migration in Latin America in the future? As environmental hazards impact the region, it is likely that most climate migrants will move internally from rural areas to cities and possibly from coastal areas impacted by both sea level rise and coastal storms to inland cities. Intra-regional migration may also increase and migration to the United States is expected to increase as well. But the evidence suggests that the most intense pressures will be within countries – and municipal authorities are likely to be on the front line of climate migration. Before delving deeper into the forms Latin American climate migration is likely to take, the following section looks at the likely impact of climate change on Latin America.

Impact of climate change on Latin America and the Caribbean

The impact of climate change on Latin America and the Caribbean depends on a) the extent to which the world community limits fossil fuel emissions

which drive global warming, b) the extent to which governments and communities implement adaptation measures. The IPCC has warned of catastrophic global results if temperature increase over 1.5° Celsius over pre-industrial levels and in the 2015 Paris Agreement, the international community agreed to take action to keep global warming at the 1.5° level. For the 2014-23 decade, temperatures increased by 1.19° Celsius of which 1.19° – all of the increase – was caused by human action. For 2023, the hottest year on record, the increase was 1.3° Celsius (Forster et al., 2024). The latest IPCC assessment report warns that that “[F]or 1.5°C of global warming, there will be increasing heat waves, longer warm seasons and shorter cold seasons. At 2°C of global warming, heat extremes would more often reach critical tolerance thresholds for agriculture and health” (IPCC, 2021). The world is presently on track to hit the 1.5 Celsius threshold by 2029 (to prevent this from occurring would require a reduction of 43 percent of emissions over 2019 levels) (Henrique, 2024). All indications are that the world will be unable to meet its target of holding global warming to 1.5° Celsius in the coming decade and that temperatures could well increase by 2.0° Celsius. This will impact all regions, including Latin America and the Caribbean.

What are the likely impacts of climate change in Latin America of 1.5° – or even 2.0° celsius warming?

According to the latest (sixth) assessment of the IPCC, the consequences are likely to be:

- An increase in the intensity and spatial impact of extreme weather events, including hurricanes and storms. Floods are presently the most common disaster in the region, affecting particularly Colombia, Brazil and Peru. In 2024, flooding in southern Brazil displaced 580,000 people (Amaral, 2024). Hurricanes Eta and Iota in 2020 affected 4 million people in Honduras alone. The Caribbean and the Atlantic coast of Central America have historically been the regions most affected by hurricanes and this is likely to continue.
- Heat waves are likely to increase as a result of climate change. Temperatures over 40° Celsius in September 2023 affected millions of people in Brazil, Argentina, Paraguay and Paraguay – and were 100 times more likely because of human-induced climate change (Thompson, 2023). Heat waves not only have serious human consequences but also have

- an economic impact when the temperature is simply too hot for people to work outside.
- Warmer temperatures will lead to the melting of glaciers, particularly in the Andean region which has already lost 30 percent of its glaciers. The melting of the glaciers results in water scarcity but also landslides and contributes to sea level rise. Decreasing supplies of water is likely to have major impacts on agriculturalists, resulting in loss of livelihoods and increasing pressures for rural populations to migrate to other areas.
 - Sea level rise will affect mainly coastal areas and the Caribbean is expected to be particularly hard-hit as is northern South America. Presently 84 percent of the Caribbean's population lives within 25 kms of the coast and 33 percent live in low elevation coastal zones (less than 10 meters above sea level) (Mycoo & Wairiu, 2022). While it is unlikely that the islands will be submerged, parts of the countries may become uninhabitable due to inundation or degradation of agricultural land. In Guyana, 90 percent of the population lives near the coast and is directly affected by sea level rise with frequent flooding in Georgetown (Escribano & Pineiro, 2022).
 - Warmer temperatures also increase the range of vector-borne diseases and indeed Latin America in 2023 experienced its worst-ever outbreak of Dengue Fever - with 3 times the incidence of 2022 (University of Nebraska, 2024). Warmer sea temperatures also affect marine life and can impact coastal livelihoods, particularly fisheries.
 - Warmer temperatures also lead to an increase in drought conditions and prolonged drought is another of the major consequences of climate change. Since 2000, droughts have affected more people in Latin America than any other environmental hazard - 53 million since 2000 (UNDRR & OCHA, 2023, p. 7). Drought affects agricultural production and is associated with food insecurity - which in turn leads to pressures to migrate. Within Latin America, the 'the dry corridor' in Central America and northeastern Brazil are likely to be most affected although all countries in Latin America and the Caribbean are likely to experience drought in particular subregions. Over the past 20 years, drought has particularly impacted Brazil (over 33 million affected), Guatemala (5.6 million), Haiti (4.6 million, Mexico (2.5 million and Paraguay (1.7 million) (UNDRR & OCHA, 2023, p. 31). More than half of Chile's population of 19 million live in areas suffering from severe water scarcity and the 2022 megadrought led to water rationing in Santiago (WMO, 2022, p. 18). Water shortages in Bogota, Mexico City and elsewhere intensified in 2024 as a result of drought, but also from inadequate water management policies.
 - Recurring climate-related shocks due to changes in El Niño and La Niña - cyclical shifts in the water temperature of the Pacific Ocean, each lasting 9-12 months and occurring every 2-7 years - are manifest in both increasing storms and drought conditions.
- The impacts of climate change do not affect everyone equally. The livelihoods of agriculturalists, particularly those living in areas affected by water scarcity and drought, are likely to see a decline in productivity and possibly the disappearance of their livelihoods. Indigenous groups and other marginalized minorities tend to live on land where environmental risks are higher. As many have noted, the impacts of climate change tend to be most severe on those with the fewest resources - and on those who have contributed the least to the carbon emissions which are driving climate change. This has given rise to demands for climate justice and is presently being discussed (with some acrimony) in negotiations over loss and damage (Schapper, 2018; Rosignoli, 2022; Gonzalez, 2019).
- Climate change has far-reaching economic effects. Sudden-onset disasters result in decreasing tourism - a mainstay of the economies of some countries, particularly in the Caribbean where tourism contributes an average of 32 percent to the economies (Acevedo et al., 2017). The World Meteorological Organization reported that in the Paraná-La Plata Basin, "a drop in hydropower production in 2022 due to low river flows forced countries to replace hydroelectric energy sources with fossil fuels, hampering efforts for energy transition towards net-zero emissions" (2022, p. 3). More recently, the loss of power in Ecuador in 2024 was the result of the failure of power plant operations, exacerbated by the political crisis (Kueffner, 2024). Hydropower is the main source of electricity generation in most Latin American countries, accounting for 45 percent of the total electricity supply in the region (WMO, 2022, p. 22).
- It is important to emphasize that climate change is not the only environmental risk affecting

Latin American countries. Environmental degradation – caused by poor land management and deforestation – also exacerbates the impact of climate change. For example, the World Bank reports that over 17 percent of the Amazon forest has already been lost (World Bank, 2021, p. 5). Issues of land ownership, agricultural management practices, and poverty affect the way in which natural hazards affect food security, and resilience to climate shocks and migration. And as the World Bank has found, environmental degradation can increase the possibility of conflict – resulting from competition for scarce natural resources. And conflict, in turn, results in further environmental degradation (Ahmadnia et al., 2022).

Climate migration in Latin America

As noted above, Latin Americans have traditionally used seasonal migration as an adaptive response to environmental factors; historically, agriculturalists have migrated – or sent one family member – to the cities to provide additional income during dry seasons. This is likely to intensify as the temperature warms and droughts increase due to the effects of climate change. Climate change is expected to intensify urbanization with rural migrants often settling in informal settlements which are exposed to environmental hazards. As the World Meteorological Organization reports, “in the LAC region, urbanization expansion into hills and steep slope hazard areas of cities has increased the risk to hydrometeorological hazards such as landslides” (WMO, 2022, p. 21).

The World Bank (Rigaud et al., 2018) projects that between 9.4 and 17.1 million Latin Americans will move within their countries as a result of climate change by 2030 – depending on the world’s ability to implement more or less climate-friendly policies. Most will move from coastal areas susceptible to flooding and storms and from drought-prone regions with areas such as the central plateau of Mexico and highlands of Guatemala as in-migration hotspots. Far fewer numbers are expected to move internationally.

As noted above, environmental conditions always interact with economic factors in driving decisions to migrate and few Latin American migrants attribute their decision to move to environmental factors. For example, when Central Americans are asked about their reasons for migration, overwhelmingly, they cite economic

reasons. A 2021 study by the Migration Policy Institute, the Organization of American States and the Inter-American Development Bank surveyed 5000 households in 12 departments in the 3 Northern Central American states. Economic reasons were overwhelmingly cited as the driver of migration among respondents. Only 6 percent of respondents from the three countries attributed their decision – or even one of the reasons for their decision, as respondents could pick more than one reason for migrating – to environmental or climate factors, ranging from 4 percent in Guatemala to 8 percent in El Salvador and 9 percent in Honduras. The higher percentages in El Salvador and Honduras likely reflect the lasting effects of Hurricanes Eta and Iota in these two countries (Ruiz Soto et al., 2021).

Determining the role of environmental factors – rather than poverty – in decisions to migrate is extremely difficult. Environmental conditions – such as drought (see discussion of the dry corridor below) – affect livelihoods, particularly agricultural livelihoods – which causes food insecurity which in turn leads to migration. While the proximate cause of migration is the loss of livelihoods or agricultural production, it may be that climate change is producing or accelerating the loss of livelihoods. There seems to be evidence for this relationship in the case of Mexico (Hunter et al., 2013; Nawrotzki et al., 2013; Nawrotzki, DeWaard, 2016). A study by the World Food Program (2017) found that food-insecure people are three times more likely to make concrete plans to migrate than those who are not food insecure. The number of Central Americans considering to migrate has increased from 8 percent in 2019 to 43 percent in 2021, although less than 3 percent had made concrete plans to do so (Ruiz Soto et al., 2021, p. 3). It is also important to underscore that migration requires resources, and those with the least resources are often the least likely to migrate. Thus, it is likely that climate change leads to more poverty/loss of livelihoods and income and that many people will face deteriorating conditions and be forced to remain where they are rather than migrate. While there is increasing concern about climate migrants, the fact is that those experiencing the effects of climate change and who lack the resources to be able to migrate may be more vulnerable than those who are able to move. As the Foresight report warned more than a decade ago, trapped populations may be one of the consequences of climate change (United Kingdom, 2011).

The link between conflict and environmental factors also warrants further concern. It may be that growing food insecurity in Latin America – as a result of climate change – leads to increasing violence – which in turn compels people to leave their countries (World Food Programme, 2017; IOM, 2016; Milan & Ruano, 2014; Strohlic, 2021).

In 2021, farmers in the Dry Corridor – an area stretching from Southern Mexico to Panama which has historically been vulnerable to water extremes, especially droughts – experienced the worst dry cropping season in 35 years, affecting 2.2 million people, pushing them deeper into poverty and leaving them vulnerable to malnutrition. 8 in 10 households reportedly resorted to coping mechanisms, and many are planning to leave (Ruiz Soto et al., 2021).

The *Groundswell* report summarizes the impacts of global warming on climate migration in the region as follows:

Due to steadily decreasing water availability and crop production, climate migration will likely rise toward the end of the century under a high emissions pathway. Climate migrants will flee hotter, lower-lying areas for highland areas. Climate migrants will leave climate-out migration hotspots like the low-lying coastal areas along the Gulf of Mexico and the Pacific Coast of Guatemala, decreasing rainfed crops in places like Monterrey and Guadalajara. Climate migrants will move to climate-in migration hotspots with more favorable climates, including the Central Plateau of Mexico and the highlands of Guatemala. By 2050, internal climate migrants in Mexico and Central America could make up roughly 1 percent of the subregion's population.

[Further] Sea level rise and storm surge will increase climate-out migration in the coastal areas, with the pessimistic reference scenario projecting about 400,000 fewer people on average in the coastal zone by 2050. In addition, climate change will be a driver of rural to urban migration. Urban areas are expected to see a rise from 90 million people in 2010 to about 140 million people in 2050 under all three scenarios. Low-income countries in Central America will face increased pressure from population growth, even if they pursue more climate-friendly development plans. However, middle-income countries like Mexico with more robust adaptive capacities could affect climate impacts throughout the subregion. (Rigaud et al., 2018, pp. 99-107)

Of course, migration has been an adaptation strategy for decades for agriculturalists in the region in response to drought, and most of this migration is temporary, seasonal, and internal (De San et al., 2021). Nagabhatla et al. (2020) note that often when seeking refuge from climate extremes, migrants are forced to relocate to other vulnerable areas such as steep slopes which are prone to landslides.

Traditionally men have migrated to seek other income-generating activities during the dry season (De San et al., 2021). However, climate change is exacerbating the weather extremes and hence is increasing pressure on rural households to migrate. Those who remain in their communities are dependent on remittances that migrants send home (Läderach et al., 2021). Yet concern is increasing about the ability of urban labor markets to absorb the growing number of migrants coming in search of livelihoods (Baez et al., 2017). Urban areas are already overstretched, and continued migration is likely to overwhelm cities with the demand for more services and infrastructure, outpacing the ability of local governments to accommodate the growing population (Läderach et al., 2021; Rigaud et al., 2018). And some migrants move to other countries which may be a more permanent form of adaptation. Although, as noted above, it is difficult to attribute increased migration solely to environmental change, there have been increased migration flows from Guatemala, El Salvador, and Honduras to the United States coinciding with extended droughts (De San et al., 2021). The Center for Climate & Security (Tower, 2021) maintains that the uptick in migration from Central America in recent years is partially driven by droughts exacerbated by climate change. While this may well be the case, it is difficult to marshal evidence that climate change is the – or even a – driver of migration given other factors – such as poverty, gang violence, and corruption which also all play a role in people's decisions to migrate. Demographic factors also play a role; as noted previously the surge in the region's youth population may be one reason for increased migration from the region although as Clemens and Graham (2019) note, a likely decrease in the youth population could also lead to a decline in migration.

Climate change and migration have a particular impact on women who are not only at risk due to food insecurity caused by climate change (Fraga, 2020) but also face risks when they migrate or when family members do so, including the risk of sexual violence (Médecins sans Frontières, 2024).



Drought also seems to play a role in exacerbating causal factors of gender-based violence (De San et al., 2021) and studies have found that the risk of gender-based violence increases after sudden-onset disasters (IFRC, 2015).

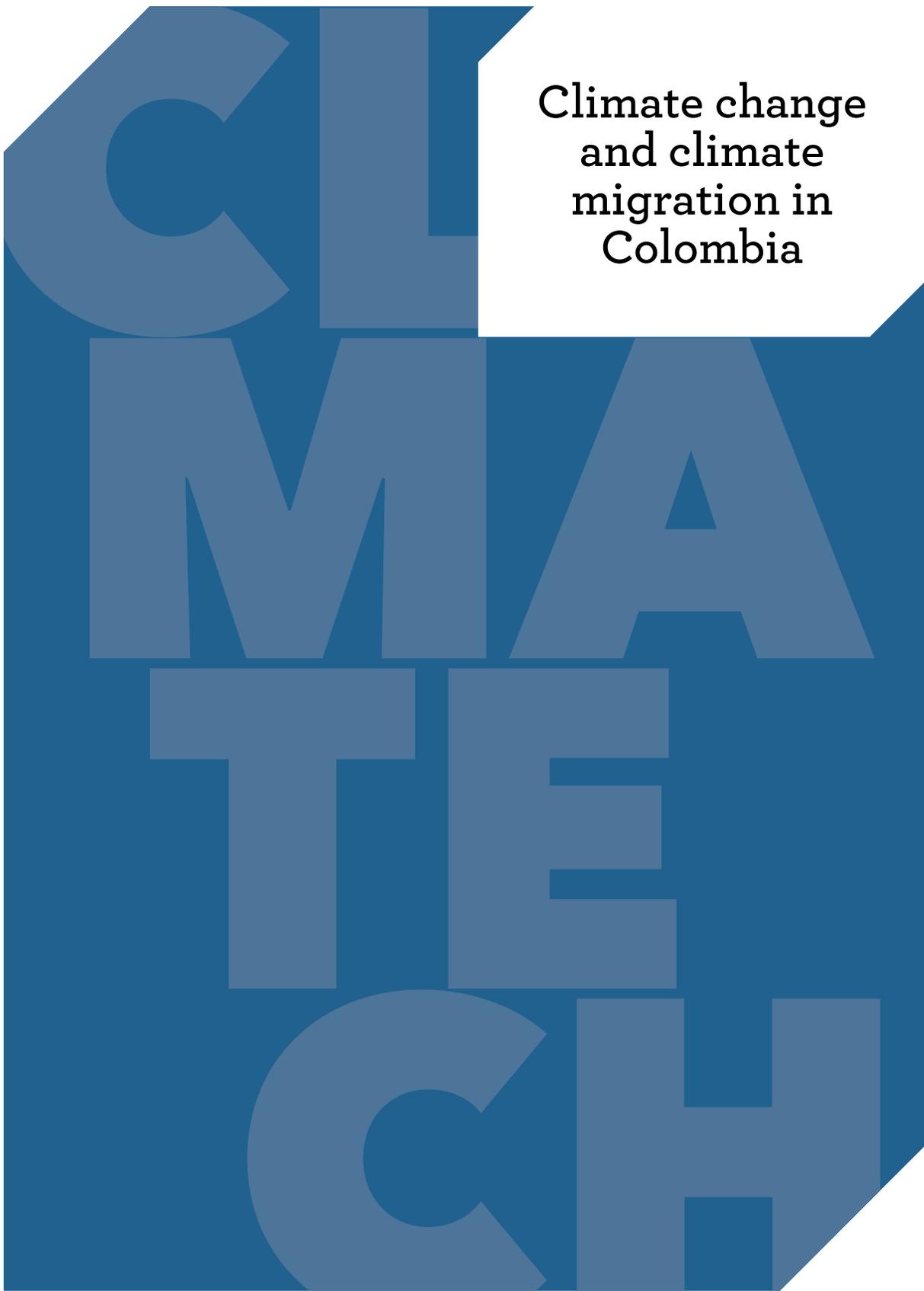
When men migrate because of drought, the women left behind take on increased responsibilities (De San et al., 2021). Women and girls hold the burden of providing food, water and fuel, and the amount of time it takes to accomplish these tasks often increases due to environmental pressures. During long periods of drought women and girls have to travel longer distances in search of water which further limits their time available for education and other activities (Fraga, 2020).

Ardittis and Laczko (2021) looked specifically at children's experiences in migrating to the U.S. Children who are displaced - including those displaced by natural hazards such as hurricanes - are at particular risk, especially when they are separated from their families. They face an increased risk of opportunistic diseases in emergency shelters and diseases resulting from lack of clean water supply. Children's access to education almost always suffers in displacement (Unicef, 2021).

A study by IOM finds that anecdotal evidence from field practitioners suggests that environmental hazards - whether sudden or slow-onset - make migration more risky and the potential for exploitation more likely, particularly when people are displaced. The study notes that many "displaced persons who

see irregular migration as the only viable option to pursue better opportunities may seek assistance from human smugglers, placing themselves at risk of many of the forms of exploitation that are commonly associated with trafficking, such as sexual exploitation, forced labour, forced marriage, as well as organ removal" (IOM, 2016).

Indigenous groups, like other marginalized communities, may be more vulnerable to the effects of climate change, given the location of their lands and other factors (Camacho & Soto-Acosta, 2021). While migration can be an adaptation strategy for rural communities, this may not be the best option for indigenous communities, as indigenous peoples remain particularly vulnerable to marginalization and discrimination in receiving communities (Fraga, 2020). Migration can also mean loss of culture and language for indigenous groups who have deep ties to the land. Due to difficult access to education, indigenous populations may lack easily transferable skills. Similar to other migrants, indigenous people often work in the informal sector, where they face discrimination and exploitation. Similarly, people with disabilities tend to be economically vulnerable and have limited access to social services, employment, and social integration. As a result, adaptation through migration becomes less of an option (Fraga, 2020). Interestingly, Coamex (2022) finds that many Central American migrants become disabled as a result of injuries experienced during their migration through Mexico toward the U.S.



Climate change
and climate
migration in
Colombia

Colombia is a country at high risk of both sudden- and slow-onset disasters. Colombia has the highest disaster risk index in Latin America and the fourth highest globally. Between 2016 and 2022, 536,000 new displacements due to disasters occurred (of which over half occurred in 2022 alone) (IOM, 2023). Most of these displacements have been due to flooding in spite of the fact that the country's Atlantic coast is at a relatively low risk of hurricanes – although in 2020 Hurricanes Eta and Iota affected 300,000 people and incurred economic losses estimated at \$100 million (Abeldaño Zuñiga & Narcizo de Lima, 2023).

The country's climate varies between high elevation areas, temperate zones and tropical zones – each of which is affected differently by the impacts of climate change. Most of the country's population live in either the Andean highlands or the Caribbean coast. The Andean region is impacted by the melting of glaciers and the resulting shortage of water as well as by earthquakes – a geophysical hazard which is not covered here but which increases the risk to people living in the highlands. Although the country is rich in water resources, glacier melt coupled with the risk of drought in parts of the country will likely impact hydropower production.

Temperatures are expected to increase by 1.88° Celsius by 2050 and by 3.88° by the end of the century under a high emissions scenario. The highest temperature increase is expected in the Northeast. Of particular concern is the projected rise in the number of very hot days (above 35°) from 16 to 131 (World Bank, 2023, p. 9)

It is also important to signal that the effects of climate change are taking place in a country which is still experiencing armed conflict – indeed there are around 5 million IDPs displaced by conflict – with almost 300,000 displaced in 2023 alone (IDMC,

2024). More than half of the population affected by natural hazards also live in areas affected by the armed conflicts. Moreover, Colombia currently hosts close to 3 million Venezuelan migrants (UNHCR, 2024). Given this volatile environment it is not surprising that discussions of climate migration seem less urgent than the ongoing internal displacement and influx of migrants.

With respect to longer-term impacts of climate change, Colombia's climate vulnerability is high, ranking 29 out of 191 countries in the 2024 Risk Inform Index, ranking 26 in terms of heat and hazard exposure and 22 for vulnerability (European Commission, 2024). Around 85 percent of the country's population live in areas exposed to disasters and the effects of climate change. Small-scale agriculturalist, indigenous and Afro-Colombian communities and internally displaced persons are particularly affected by these climate impacts.

The effects of climate change are expected to impact the agricultural sector (including high value export crops) with an estimated 60 percent of cultivated land expected to be impacted. The effects of climate change are exacerbated by poor land management in some areas. Increasing heat – particularly in the number of very hot days – increases the risk of heat stress on livestock. The climate-related increase in diseases, pests and bacteria will also impact agricultural production. 16 percent of Colombia's population works in agriculture (World Bank, 2023) and according to World Bank Group projections, by 2050, climate change in Colombia will impact 14 percent of the GDP corresponding to agriculture, and predicts that without adaptation, 80 percent of the country's crops could be impacted in more than 60 percent of their current areas of cultivation, especially high value perennial and export crops.

Around half of Colombia's coastline is experiencing the effects of coastal erosion - the result of both climate change and the impact of the expansion of the tourism industry in the Caribbean coastal cities of Cartagena, Santa Marta and Barranquilla as well as others. Rapid urbanization in these areas, coupled with sea level rise increases the risk of flooding of coastal areas (Othring and Belonging Institute, 2024).

Presently 81.4 percent of Colombia's population lives in urban areas - a percentage expected to increase to 88.8 percent by 2050 (World Bank, 2023, p. 2). The poverty rates are much higher in rural areas; the combination of poverty and the effects of climate change on the agricultural sector mean that it is likely that many climate migrants will move from rural areas to cities. And given the risks of coastal erosion, storms and sea level rise, it is likely that people will move away from coastal areas.

Although there is substantial scientific evidence about the impact of climate change on Colombia, there is surprisingly little research on climate migration - where and when such movements will occur (IOM, 2023; Sarmiento-Erazo, 2018; Tamayo, 2024). While studies on Latin America underscore that most movements will be internal and away from coastal areas, there is little published research on how these trends will play out in Colombia. Will people move to the highlands from coastal areas to escape the risk of flooding and storms? Given the fact that the risk of earthquakes and volcanoes is higher in the Andean region, will they simply move from one type of environmental risk to another? Will those moving, at least in part, because of climate change, join the ranks of migrants living on the outskirts of large Colombian cities? Colombia's cities have a generally positive record of absorbing large numbers of Colombians displaced by violence - and more recently millions of Venezuelan migrants. Will this pattern continue to hold if large numbers of climate migrants further increase urbanization? Will resources be made available to support municipal governments in providing services to new arrivals escaping environmental hazards? Is the Colombian government's safety net robust enough to support those with particular needs?

Colombia has a long history of strong policies in three areas which are particularly relevant to climate migration: climate change adaptation, disaster risk reduction and internal displacement. Colombia has been a leader in climate change policy, adopting a National Adaptation Plan in 2011, passing important pieces of legislation and

policies (e.g. 2018 and 2021 climate laws and the 2019 national electric vehicle law), and updating its Nationally Determined Policies (Colombia, 2021) which has been lauded as one of the most ambitious in Latin America and the Caribbean (Vergara et al., 2021) and seeks to achieve carbon neutrality by 2050. Climate change adaptation policies have been incorporated into national development plans, including its 2022-2026 national development plan and municipal and subnational governments have formulated their own climate change adaptation plans. Its long term E2050 climate strategy² identifies human mobility as a strategy to manage climate change and call for the reduction of vulnerability in communities of origin to reduce the risk of displacement. Its updated Nationally Determined Policies acknowledges that climate change can cause displacement and recognizes the risk that climate change poses to displaced populations.

Colombia has long had a robust system of disaster risk management with a National Risk Disaster system coordinating efforts of 6 agencies at the regional, provincial and municipal levels. The government has implemented several hard engineering protection measures along the Caribbean coast although these have not managed to stop the substantial coastal erosion.

Given the scale of conflict-induced internal displacement and Colombia's strong judicial systems, Colombia has historically been a leader in developing laws and policies on internal displacement and since the 2011 Law 1448 (the 'Victims law') and the 2016 peace agreement, has taken measures to retribute or compensate people displaced internally by the conflict although the process has been painfully slow. In 2023, a draft law was submitted to the Colombian legislature on climate displacement. The law, if passed, would set out a broad definition of climate displacement, identify the causes (both sudden and slow-onset hazards), create a national registry and provide preferential access to those displaced by the effects of climate change (Balasundran & Tower, 2023). There are very few countries in the world that have developed laws and policies on climate displacement (Vanuatu and Fiji being the main exceptions) and this would mark a major step forward in the region.

In spite of these positive developments, there are also worrying signs. Deforestation in Colombia is widespread and has increased since the 2016

² For more information see <https://www.minambiente.gov.co/cambio-climatico-y-gestion-del-riesgo/estrategia-2050/>



peace agreement, as insurgent groups have used illegal mining and coca cultivation as sources of income (Igini, 2023). According to Global Witness, 382 environmental defenders were killed in

Colombia over the 2012-22 period. 60 of these deaths occurred in 2022 - more than a third of the total number of environmental defenders killed globally (Global Witness, 2023).



Conclusions



Climate change is already impacting Latin America and the Caribbean and the consequences of climate change are likely to intensify in the coming years. But it all depends on whether countries of the world can successfully reduce the carbon emissions that are warming the planet. In 2023, global emissions increased by 1.1 percent (down from 1.3 percent in 2022) – a decrease made possible by the growth of clean energy. But China now accounts for 35 percent of global emissions and countries in developing Asia produce half of global emissions – up from 25 percent in 2000. India has surpassed the European Union to become the third largest emitter (after China and the United States) (International Energy Agency, 2024). If carbon emissions can be reduced – or at least not increase – the impacts of climate change on Latin America can be minimized – including pressures on populations to migrate.

Climate migration can be a positive adaptation to the negative impacts of climate change. Moving away from areas that have become uninhabitable to places that are safer can save lives, protect livelihoods and improve the quality of life. At the same time, displacement – when people are forced to move, often at very short notice as a consequence of a sudden-onset environmental hazard – almost always has negative consequences for those displaced. The challenge for governments is thus how to encourage and plan for safe orderly migration away from areas of high environmental risk (including through planned relocations) and, at the same time, how to prevent the forced displacement of individuals and communities. In order for governments to be able to plan for

climate migration, they need solid evidence on environmental risk and the potential impact on their communities. Given the many pressures on governments, including municipal governments, the challenge of climate migration seems like a distant issue. In Colombia, for example, the government is already challenged to find solutions for the country's 5 million people displaced internally by conflict and to respond to the immediate needs of several hundred thousand people recently displaced by conflict as well as to the needs of the almost 3 million Venezuelans who have sought safety in the country (IDMC, 2024; UNHCR, 2024). Preparing for potential climate migration – particularly when the scale and direction of these movements are uncertain – is understandably less urgent. It is thus remarkable and commendable that legislation on climate migration has been introduced into the Colombian Congress. Development of national laws and policies is not a panacea; its effectiveness depends on implementation. But it is an important first step which can raise awareness about specific issues and catalyze action by sub-national governments and civil society groups.

Climate migration is likely to challenge all Latin American and Caribbean governments in the coming decades in many ways. Deepening the scientific analysis to identify communities at risk, increasing investment in disaster risk reduction and climate change adaptation, and strengthening social protection for communities threatened by the effects of climate change are all needed. But fundamentally the extent to which governments are able to implement these measures depends on political will.



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