2. Gaps in the measurement of internal displacements driven by weather-related disasters

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Abstract

This report aims to analyze the accuracy of the data regarding start-date and end-date of the internal displacements recorded in the Global Internal Displacement Database, in countries of Latin America and the Caribbean between 2013 and 2015. Overall, 479 climate-related disaster situations were identified, of which 68.7% correspond to hydrological events. Colombia was the country that experienced the highest number of events (351). The number of displaced, however, shows a more heterogeneous distribution, with Bolivia at the top of the list (685 262 people), followed by Paraguay (43 005 people) and Brazil (322 126 displacements). A total of 2 164 402 internally displaced persons were registered between 2013. Regarding the displacement duration, only 45.9% of the data were accurate. Results led to conclude that the accuracy found from the information referring to the start date and end-date of the displacements has not been satisfactory due to the lack of data in almost 54% of the records for LAC.

Keywords: *disaster displacements, internal displacements, weather-related disasters, disaster risks, environmental hazards.*

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Introduction

Since the late 1990s, the frequency, intensity, and geographic distribution of weather-related disasters have increased significantly. Several countries in Latin America and the Caribbean (LAC) have been affected by these changing conditions. It is well documented that the increasing incidence of such events is related to climate change through variations in rainfall patterns and higher temperatures, responsible for floods, droughts, heat waves, and melting glaciers (Kälin 2010; Nagy *et al.,* 2018).

There is agreement that the least developed regions are the most affected by weather-related disasters, since many of them are highly dependent on natural resources and climate-sensitive sectors, such as agriculture. Also, many countries from these regions are located in parts of the world where temperature and precipitation changes are more likely to occur, and it is usually more challenging for them to recover from climate stresses (Bruckner, 2012).

LAC is affected by various sudden-onset events, including hydrological, meteorological, and climatological hazards (known as weather-related disasters) (Abeldaño Zúñiga and Fanta Garrido, 2020). Hydrological and meteorological hazards refer to those events resulting from the atmospheric and weather conditions, their interaction with the land and oceans, and the resulting water resources distribution (United Nations Office for Disaster Risk Reduction, 2020). Some examples of these types of hazards are floods, tropical cyclones, and heat waves. On the other hand, climatic hazards include atmospheric processes ranging from intra-seasonal to multi-decadal

climate variability (Center for Research on the Epidemiology of Disasters, 2020). Droughts, glacial lake outbursts, and wildfires are examples of this kind of events.

The geographic characteristics of the region make it prone to experience a high incidence of climate-related disasters. Tropical storms, cyclones, and hurricanes are more likely to occur in countries in the Caribbean region and the Mexican coasts. An emblematic disaster of this kind is Hurricane Mitch, which affected Honduras and Nicaragua in 1998; it has been recorded as the second deadliest hurricane in the Atlantic zone, causing mass displacement (Loebach and Korinek, 2019). The countries of Central America and the Amazon region, on the other side, are mainly affected by floods and storms, while mudslides and landslides are observed in pre-mountain areas of Peru, Bolivia, Argentina, and Chile (Inzulza-Contardo and Díaz Parra, 2016; Caruso, 2017; Abeldaño Zúñiga and González Villoria, 2018).

Weather-related disasters can lead to loss of life, destruction of infrastructure, limited water availability, loss of biodiversity, and reduced agricultural production, thus increasing food insecurity. The exposure to hazards and the effects can motivate population displacements, especially when they interact with pre-existing conditions, such as limited access to land, insufficient and untimely responsiveness capacity from local governments, and the presence of armed conflict, among other factors (Rodríguez Serna, 2015).

Human mobility driven by weather-related disasters can take the form of internal or cross-border migration. It may also include forced displacements and planned or unplanned relocation. It involves a wide range of mobility processes, both in terms of motivation (with or without the mediation of the authorities), as well as in their spatial dimension (internal and cross-border displacements; short and long distances) and in their temporal dimension (short time, long-term, recurring, lifetime) (Internal Displacement Monitoring Centre, 2018a).

This paper examines the number of human displacements caused by weather-related disasters in LAC countries between 2013 and 2015. Also, we analyze the reported start date and end date of the displacements to assess the accuracy of the information recorded.

The reason for focusing on the start date and end date responds to the

need for accurate information in displacement statistics, arguing that, if the duration of the displacement is precisely known, more effective and sustainable interventions can be implemented towards ensuring the protection of human rights while the displacement remains. The information on this matter may contribute to delve migration processes with dignity by allowing better planning of humanitarian assistance resources, such as water provision, food, and clothing, while the displacement situation lasts (Rodríguez Serna, 2015).

Classification of disasters and scenarios of internal displacements

According to the classification provided by the Centre for Research on the Epidemiology of Disasters (CRED) (2020), there are two main groups of disasters: natural and technological. Natural disasters, in particular, include geophysical, meteorological, hydrological, climatological, biological, and hazards caused by threats of extraterrestrial origin (such as meteorite impacts). However, there is enough evidence that led us to avoid the terms "natural disasters".

The following analysis focuses on the displacements caused by meteorological, hydrological, and climatological disasters, conventionally conceived as weather-related disasters. However, it must be noted that people's displacements are not only caused by rapid-onset events; there is a growing body of evidence that shows that human mobility is also driven by slow-onset hazards and processes (Internal Displacement Monitoring Center, 2018a). Many impacts of slow-onset events are indeed sudden-onset events. For instance, desertification facilitates the occurrence of wildfires, or increasing temperatures may turn into heat waves. Hence, it is a complex task to determine whether a disaster results from either a sudden or a slow-onset event, as they are closely connected.

Siegele (2012) and UNFCCC (United Nations Framework on Climate Change, 2012, p. 7) established a distinction between sudden-onset and slow-onset events related to climate change impacts:

> A rapid onset event may be a single, discrete event that occurs in a matter of days or even hours, whereas slow-onset events evolve gradually from incremental changes occurring over many years or from an increased frequency or intensity of recurring events.

With regards to the situation of internal displacement caused by disasters, Walter Kälin (2010) has described five possible scenarios:

Scenario 1: Characterized by sudden-onset events, such as floods, storms, hurricanes, typhoons, landslides, or avalanches. They can cause sudden massive forced displacement.

Scenario 2: Characterized by slow environmental degradation caused by the long-term effects of rising sea levels, droughts, soil desertification, and the mechanisms of degradation of drinking water sources.

Scenario 3: Due to rising sea levels and low elevations, some areas may become uninhabitable.

Scenario 4: This is the case in which there is an active intervention by local authorities to evict households located in areas considered to be at risk (riverbanks, hillsides, and mountains).

Scenario 5: This scenario is more complex, because it is related to forced displacements caused by situations of violence and armed conflicts. In this case, the circumstances of the context interact with natural resources availability. In general, the largest migration flows are driven by the availability of drinking and irrigation water. In these cases, the resettlement to the place of origin would depend on the conflict resolution and on natural resources availability.

Following the five scenarios described by Kälin (2010), it is possible to think about the potential duration of people's displacements, according to the type of disaster. In scenario 1, sudden-onset disasters predominate.

Therefore, it would be expected that the resulting displacement from this scenario is not long-term. Depending on the management of the disaster situation by local and national official agencies, displaced people would be able to return to their homes in most cases. In scenario 2, slow environmental degradation causes the threatening of water resources in some regions. In these cases, the long-term scenario can lead to a "voluntary" migration in search of adaptations to the changing environment. However, in

cases where the areas cannot be re-habitable, one would be talking about a permanent forced displacement depending on the desertification level. In scenario 3, displacement is pressing small states (for example, island states of the Caribbean). The population would need to move to other countries, so the category of "internal displacement" does not match this dynamic. In scenario 4, unlike what was mentioned in Scenario 1, there are no possibilities of a return due to permanent displacement. In scenario 5, the return would depend on resolving the conflict and the availability of natural resources.

Internal displacements due to weather-related disasters in numbers

The Internal Displacement Monitoring Center (IDMC) is an organization that began tracking displacements within countries or territories driven by violence (armed conflicts) in 1998. Later, in 2008, it started tracking disaster-driven internal displacements (Internal Displacement Monitoring Centre, 2020). It is currently the main global database for monitoring the internal displacements.

The methodology used to evaluate the internal displacements due to this type of event consists of producing estimates based on the monitoring and reports of displacement cases induced by disasters, event by event. For each event, IDMC collects data from a wide range of sources, including government offices at the national and local levels, UN agencies, civil society organizations, and the media, among other entities (Internal Displacement Monitoring Centre, 2017). In some cases, they also apply remote sensing technologies to produce some data (Internal Displacement Monitoring Centre, 2018b).

In the absence of available and accurate data on the different typologies of displacement, we focus solely on internal displacement, defined as the forced movements of people within the country. The United Nations Guiding principles defined internally displaced persons as

> […] persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border (United Nations Office for the Coordination of Humanitarian Assistance, 1998, p. 5).

On the other hand, in this study it is assumed that the "displacement by disasters" is a subset of internal displacement, and which refers to the "displacement that may take the form of spontaneous flight, an evacuation ordered or enforced by authorities or an involuntary planned relocation process" (The Nansen Initiative, 2015, p. 15).

The IDMC database considers two units to quantify internal displacement: households and individuals. To provide accurate estimates of the volume of people displaced by weather-related disasters and make valid comparisons across countries and over time, the database was harmonized using the average number of people per household. Following the criterion of "the last available data source", this information was obtained from the respective National Census of Housing and Population, Demographic and Health Surveys (DHS), and Demographic Yearbooks of the United Nations.

Records in the IDMC database include, but are not limited to, the following fields (Internal Displacement Monitoring Centre, 2019):

Start Date: refers to the start date of the internal displacement.

Start Date Accuracy: refers to whether the start date has been accurately captured. The three categories included in this variable with day, month, and year. In the case of the "day" category, it implies a precise date for the start of the displacement. In the "month" category, the start of the displacement is recorded on the first day of the month in question, but this is done because the day of the start is not precisely known. The category "year" is used when neither the day nor the month of the start is known. The start is then attributed to the first day of January 1 of the year in question (even when it has started later). This is due to the imprecision of the primary IDMC sources.

End Date: refers to the end date of the internal displacement.

End Date Accuracy: refers to whether the end date has been accurately captured. The three categories included in this variable with day, month, and year. In the case of the "day" category, it implies a precise date for the end of the displacement. In the "month" category, the end of the displacement is recorded on the last day of the month in question, but this is done because the day of the start is not precisely known. The category "year" is used when neither the day nor the month of the end of the displacement is known. So, the end is attributed to December 31 of the year in question (even if it ended earlier). This is also due to the imprecision of the primary IDMC sources.

Table 1 shows the number of climate-related disasters and the volume of displaced people by type of event for 19 LAC countries between 2013 and 2015. In total, 479 climate-related disaster situations were identified, of which 68.7% correspond to hydrological disasters (329 events). Colombia was the country that experienced the highest number of threats (351) in the three years, representing 73.3% of all events. The number of displaced, however, shows a more heterogeneous distribution, with Bolivia at the top of the list (685 262 people), followed by Paraguay (432 005 people) and Brazil (322 126 displacements). A total of 2 164 402 internally displaced persons were registered between 2013 and 2015 in the countries analysed.

How accurate are these data?

One of the most considerable difficulties in measuring any type of human mobility lies in determining the temporal parameters of the movement to be evaluated, the spatial parameters, and motivation for mobility. The fact of knowing with precision the duration of the displacement implies adequate attention to their humanitarian needs (food, water, clothing, among others), avoiding the exposure of displaced persons to diseases associated with displacement, as well as the availability of elements more precise for the protection of your rights.

Another element to take into account is the precision of the estimates of displaced persons. For this, the IDMC performs its calculations consider-

Table 2.1. *Number of weather-related disasters and displaced population by country and type of event. Latin America and the Caribbean, 2013-2015*

Country	Number of events				Displaced population			
	Climatological	Hydrological	Meteorological	Total	Climatological	Hydrological	Meteorological	Total
Argentina	0	14	2	16	0	67 907	6 728	74 635
Bolivia	1	8	0	9	2 000	683 262	0	685 262
Brazil	0	14	1	15	0	321 126	1 000	322 126
Chile	7	2	0	9	20 842	33 681	0	54 523
Colombia	15	230	106	351	596	51 693	20 094	72 382
Costa Rica	0	2	0	2	0	1 102	0	1 102
Cuba	0	1	0	1	0	2 000	0	2 000
Dominican Republic	0	3	5	8	0	21 635	33 209	54 844
Ecuador	1	2	0	3	2 109	8 867	0	10 976
El Salvador	0	0	0	2	0	2 596	0	2 596
Guatemala	0	0	0	7	0	5 627	0	5 627
Honduras	0	0	0	4	0	7 960	0	7 960
Mexico	0	3	3	9	0	43 402	224 000	267 402
Nicaragua	0	0	0	5	0	36 618	0	36 618
Panama	0	8	3	11	0	535	1 631	2 166
Paraguay	0	4	1	5	0	407 165	24 840	432 005
Peru	1	11	3	15	16 218	32 544	8 012	56 774
Uruguay	0	4	1	5	0	28 501	1 000	29 501
Venezuela	0	2	0	2	0	45 904	0	45 904
Total	25	329	125	479	41 765	1 802 124	320 513	2 164 402

Sources: Elaborated by the authors based on the Global Internal Displacement Database 2013-2015.

ing two dimensions: the flow and the stock of internally displaced persons (Internal Displacement Monitoring Centre, 2018b).

In climate-related (sudden onset) disasters, it is relatively easy to identify the start date of displacement due to the spontaneous and distinct nature of the onset of disasters. By contrast, slow-onset events pose more significant complications when determining the start of displacement.

For its part, establishing the end date of population movements can be a complex task. Disasters involve social and economic costs for individuals and families that underlie displacement situations. These costs are derived from the financial loss caused by damage to infrastructure and properties, loss of employment, school closings, and other intangible assets affected by sudden threats (Cavallo *et al.,* 2010). These collateral factors may also be responsible for generating new displacements.

Regarding the completion of the displacements, in 2007, Walter Kälin published a framework for durable solutions. Although this document is focused initially on internal displacement due to conflict, three categories of criteria can be observed to determine the end of internal displacement (The Brookings Institution – University of Bern, 2007).

The cause-based criteria focus on the causes of displacement. These criteria consider the existence of "changing circumstances" of those that forced the flight to signal the end of the displacement. It means that a person would cease to be internally displaced when there are changes in the circumstances that led to the displacement (The Brookings Institution – University of Bern, 2007). This could apply to the end of a sudden-onset event but does not fit the dynamics of slow-onset events.

The solution-based criteria suggest that internal displacement can be considered to have ended when internally displaced persons return to their communities of origin or re-establish in another district. This implies that the return must have been carried out voluntarily and in conditions of safety and dignity. The internally displaced must also have been reintegrated into the community of origin or integrated into the "new" local community.

The third criteria, which are based on a needs approach, assume that

> […] when internally displaced persons no longer have specific protection, assistance or reintegration needs related to their displacement, the interna-

> tional community would no longer consider them of international interest (although their displacement may continue and may continue to have needs based on poverty or disability) (The Brookings Institution – University of Bern, 2007, p. 39).

Although we do not have firm evidence of applying these criteria in those displaced by disasters, this criterion could be the one that adjusts to the humanitarian needs of people internally displaced by a climate-related event, under an approach based on utilitarianism.

Table 2.2 shows the precision of the start date and the end date of internal displacement caused by climate-related disasters that occurred during 2013-2015 in the countries analyzed. The data is considered accurate if there is a record of the exact dates of the displacement (day, month, and year). If there is no record of this information or only the month or year of occurrence was recorded, the data is interpreted as inaccurate. Overall precision indicates proper recording of both the start date and the end date of internal displacement.

The analyses after the standardization of the database showed that the data recorded by the Internal Displacement Database, concerning the countries of Latin America and the Caribbean, accurately identify the start (start) date of the displacements due to climate-related disasters in 96.2% of the records during the period studied. However, the accuracy of the records drops to 46.3% when analyzing the reported end dates of internal displacements. At the global level, when combining both indicators, it was found that only 45.9% of the events were reported accurately.

It can be seen that, in general, the records of the start date show a higher percentage of precision than the data on the end date. By extension, overall accuracy gets slower. This reaffirms the technical difficulty in determining the completion of displacement, as discussed in the preceding paragraphs (The Brookings Institution – University of Bern, 2007).

When viewing these data, it is not easy to establish which countries have the highest accuracy due to the small number of events recorded in some countries. For this reason, it was decided to calculate a global accuracy for all the countries of the region, which is 45.9%, as previously commented.

Table 2.2. *Accuracy of the dates and units of measurements of internal displacements driven by weather-related disasters reported in the Internal Displacement Database. Latin America and the Caribbean, 2013-2015*

Country		Start date		End date		Global date accuracy	Unit of measurement			Total
		Accurate	Inaccurate	Accurate	Inaccurate		Persons	Household	Not specified	
Argentina	N	11	5	11	5	10	16	0	0	16
	%	68.8	31.1	68.8	31.1	62.5	100.0	0.0	0.0	100
Bolivia	N	8	1	6	3	6	3	5	1	9
	%	88.9	11.1	66.7	33.3	66.7	33.3	55.6	11.1	100
Brazil	N	11	4	8	7	8	13	2	0	15
	%	73.3	26.7	53.3	46.7	53.3	86.7	13.3	0.0	100
Chile	N	8	1	5	4	4	5	4	0	9
	%	88.9	11.1	55.6	44.4	44.4	55.6	44.4	0.0	100
Colombia	N	351	0	144	207	144	4	347	0	351
	%	100.0	0.0	41.0	59.0	41.0	1.1	98.9	0.0	100
Costa Rica	N	2	0	1	1	1	2	0	0	2
	%	100.0	0.0	100.0	0.0	100.0	100.0	0.0	0.0	100
Cuba	N	1	0	1	0	1	1	0	0	1
	%	100.0	0.0	100.0	0.0	100.0	100.0	0.0	0.0	100
Dominican Republic	N	8	0	7	1	7	6	2	0	8
	%	100.0	0.0	87.5	12.5	87.5	75.0	25.0	0.0	100
Ecuador	N	3	0	2	1	2	2	1	0	3
	%	100.0	0.0	66.7	33.3	66.7	66.7	33.3	0.0	100
El Salvador	N	2	0	2	0	2	1	1	0	2
	%	100.0	0.0	100.0	0.0	100.0	50.0	50.0	0.0	100
Guatemala	N	6	1	4	3	4	4	2	1	7
	%	85.7	14.3	57.1	42.9	57.1	57.1	28.6	14.3	100

Honduras	N	3	1	1	3	1	3	1	0	4
	%	75.0	25.0	25.0	75.0	25.0	75.0	25.0	0.0	100
Mexico	N	9	0	5	4	5	8	1	0	9
	%	100.0	0.0	55.6	44.4	55.6	88.9	11.1	0.0	100
Nicaragua	N	5	0	2	3	2	3	1	1	5
	%	100.0	0.0	40.0	60.0	40.0	60.0	20.0	20.0	100
Panama	N	10	1	6	5	6	7	2	2	11
	%	90.9	9.1	54.5	45.5	54.5	63.6	18.2	18.2	100
Paraguay	N	3	2	3	2	3	3	2	0	5
	%	60.0	40.0	60.0	40.0	60.0	60.0	40.0	0.0	100
Peru	N	13	2	9	6	9	6	8	1	15
	%	86.7	13.3	60.0	40.0	60.0	40.0	53.3	6.7	100
Uruguay	N	5	0	3	2	3	5	0	0	5
	%	100.0	0.0	60.0	40.0	60.0	100.0	0.0	0.0	100
Venezuela	N	2	0	2	0	2	1	1	0	2
	%	100.0	0.0	100.0	0.0	100.0	50.0	50.0	0.0	100
Total	N	461	18	222	257	220	93	380	6	479
	%	96.2	3.8	46.3	53.7	45.9	19.4	79.3	1.3	100

Measurement of internal displacements driven by disasters: Addressing the gaps

Traditionally, in LAC, the measurement of internal migration has been based solely on population census data, generally generated within the scope of the respective countries' statistical offices (Rodríguez-Vignoli, 2017). There are some concerns regarding the role of the census data, the length of the inter-census period (10 years), the difficulties of capturing displacements at the micro spatial level, and the temporal immediacy between a specific hazard and the start of the displacements. Then, it represents a critical factor in the identification of displacements triggered by climate-related disasters. It is necessary to address other data sources to analyze the magnitude of this dynamic. Hence, the IDMC database is vital to be able to have a timely quantification of internal displacement.

Currently, the IDMC database is the only source that includes the information necessary to monitor internal displacement caused by disasters at the regional and national levels; and that satisfactorily meets the criteria of relevance and accessibility. In contrast, the requirements for accuracy and completeness are moderately met. Indeed, information gaps were found regarding the start and end-date of some displacements due to the absence of data or the inaccuracy of the data.

These gaps probably stem from the data collection process. In this regard, it should be noted that in most cases, the country's emergency and risk management offices are in charge of registering and reporting the volume of the displaced population. In Bolivia, the personnel in charge of this task in the floods in the departments of Cochabamba and Beni in 2014 were the local Emergency Operations Centers (COE) under the scope of the Ministry of Defense. In Paraguay, the number of internal displacements caused by the Paraná River floods, also in 2014, was registered by the administration of the National Emergency Secretariat (SEN). In Brazil, the movements generated by the floods in the states of Espírito Santo and Minas Gerais in 2013 were reported by the Civil Protection of the State Department.

The latter poses some limitations and challenges. On the one hand, the main objectives of these entities are to organize humanitarian aid and coordinate actions to prevent and mitigate the effects of disasters. For this

reason, and given the emergency nature of the hazards, data collection is likely to lose priority as it is not seen as an essential procedure. The administration in charge of disaster management must incorporate, through training, data collection as a critical process to provide timely and sufficient responses to displaced people and design prevention actions for future events. It requires the design of specific forms, the provision of reference materials and instructions, and fieldwork supervision to identify potential problems and take steps to resolve them.

It should also be noted that data on displacement is usually collected by local agencies, which must report the information to a central entity. In the absence of an appropriate information storage system or a systematized data communication procedure, the number of displaced persons may be underreported. Thus, the supervision of the data storage and communication process is also essential, as it ensures the timely and complete transfer of information to the corresponding processing units. The lack of accurate estimates delays and inhibits effective responses to the needs of displaced populations.

Additionally, having different measurement units to quantify the volume of displaced persons represents a limitation when trying to establish reliable comparisons over time and between countries. This leads to the use of complementary data sources to generate estimates. The design of specific registration forms would allow us to overcome this limitation.

Since 2005, significant progress has been made in improving international response to disasters. Initially, the Hyogo Framework for Action 2005-2015 ("Strengthening the Resilience of Nations and Communities to Disasters") included a brief reference to displacement due to disasters, indicating that displacement of populations caused by disasters events could increase the level of vulnerability and exposure to danger (International Strategy for Disaster Reduction, 2005). The subsequent discussions on the Sendai Framework and the Paris Agreement broadly covered issues related to displacement, including relocations, migration, and specific conditions of vulnerability of displaced people, as well as the transfer of remittances and resilience factors from displaced people who shape the multiple disasters effects (Kälin, 2010; Guadagno, 2016).

More specifically, The Conference of the Parties (COP), at its 21st session

in Paris, established the Task Force on Displacement to develop recommendations for integrated approaches to avert, minimize and address displacement related to climate change impacts. The Executive Committee of the Warsaw International Mechanism for Loss and Damage is entrusted by the COP to operationalize the Task Force on Displacement (United Nations Framework Convention on Climate Change, 2020).

These progressive discussions highlighted the importance and complexity of the different dimensions related to displacement caused by disasters. However, the current regional scenario raises the question of whether data collection efforts are sufficiently complete and consistent and whether their objectives are achievable in the LAC context, considering that there were more than two million internally displaced persons in the region due to weather-related events between 2013 and 2015.

We know that the frequency and intensity of climate-related events will increase in the Latin American region; therefore, it is not possible to affirm that internal population displacements will end. These will continue, and there are many implications and health, psychological, economic, rights, and other difficulties that the displaced must face during their displacement. We consider improving the accuracy of records to be a key issue in providing more accurate and timely humanitarian assistance. Also, we understand that it is not the only dimension that can be improved in terms of accuracy, but the other dimensions previously mentioned (motivation and spatial) have their own conceptual and technical difficulties and challenges.

Conclusions

All disasters can cause population displacement to a greater or lesser extent; However, according to what is observed in this study, disasters related to climate change are the ones that caused the highest volume of internal displacement of people in Latin American countries between 2013 and 2015.

The available evidence indicates that since the late 1990s the frequency and severity of disasters in the Latin American and Caribbean region have increased, and the outlook for the coming years is not very encouraging, since the trend remains constant to global level, both in this region and

globally (Quarantelli, 1999; Coleman, 2006; International Federation of Red Cross and Red Crescent Societies, 2016). The scenario for Latin America and the Caribbean is not very encouraging, since this vast region is not exempt from the impacts of climate change; therefore, an increase in the occurrence and severity of certain types of natural risks to which the population is currently exposed is expected. Meanwhile, Kälin said that global disaster records in the past two decades increased from about 200 per year to 400 per year, and most of them are related to climate change (Kälin, 2010).

In this study, the accuracy of available data to assess internal population displacements motivated by climate-related events in LAC was analyzed. It has been said that, in order to understand the dynamics of internal displacement caused by disasters properly, the effects of slow-onset events and sudden-onset events should be considered, as they both determine the incidence of subsequent hazards and processes that affect human mobility dynamics (Internal Displacement Monitoring Centre, 2018a). However, it is challenging to define that a specific event included in the IDMC database corresponds to a type of slow or sudden-onset event. For example, it is not possible to assume that a specific flood is caused by wave action, storm, or hurricane.

The difficulty in differentiating both types of events may lead to underestimating the number of internally displaced people, as they might be interpreted, by conventional data sources, as migration movements. In order to maintain reliable and consistent statistics on forced displacements driven by disasters, it would be useful for countries -especially those most affected by disasters in recent times- to implement an integrated registry of the internally displaced population.

The accuracy found from the information referring to the start date and end-date of the displacements has not been satisfactory due to the lack of data in almost 54% of the records for LAC. As described above, defining the exact moment when the displacement ends is a challenging task, essentially because several factors involved in this process determine the displacement (for example, the availability of resettlement elsewhere or pre-existing economic and labour conditions). Concerning this, the need for implementing a single registry of forced displacements becomes relevant.

On the other hand, identifying the start date and end date of displace-

ments is also essential, as it contributes to defining the humanitarian assistance required by displaced people. Suppose the temporary nature of the displacement is not known. In that case, it is harder to ensure essential services and supplies for the population displaced by disasters, such as food, shelter, clothing, hygiene, and other basic needs. Furthermore, achieving accurate data on this aspect may provide relevant information for developing normative tools that contribute to ensure and protect fundamental human rights for the displaced population.

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