



LaRutaDelClima

LOSS AND DAMAGE

IN CENTRAL AMERICA 2023



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Introduction

The Central American region is highly exposed, vulnerable and strongly impacted by climate change.¹ In recent years, Central America has experienced a continuous and increasing presence of extreme weather events.² Hurricane Mitch in 1998 was described as the worst tropical storm in the Caribbean region in two hundred years. Mitch caused twenty thousand deaths and destroyed homes and infrastructure. Due to global warming, the region has not stopped accumulating Loss and Damage due to extreme hydrometeorological events, which are increasing in intensity and frequency.³

Loss and Damage caused by climate change include both an economic and a non-economic dimension. In other words, apart from the damage that can be caused to infrastructure or housing, the climate crisis also generates the loss of culture, traditions, biodiversity, etc. these climate change impacts affect and violate the human rights of the impacted communities.⁴

These impacts are amplified by a situation of inequality, poverty and population growth in the region.⁵ In addition, changes in land use, especially deforestation and land degradation, increase vulnerability to climate change as local and national economies are highly dependent on natural resources.⁶ The Loss and Damage experienced in the region have mainly affected the living conditions of people whose livelihoods depend on the weather, especially agricultural producers.⁷

¹ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuví, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014.

² Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomer, and A. Martínez Blanco (2022). *La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima*. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf, p. 43

³ Ibid., p. 6

⁴ Ibid., p. 7; Serdeczny, Olivia. 2019. "Non-Economic Loss and Damage and the Warsaw International Mechanism." In *Loss and Damage from Climate Change. Climate Risk Management, Policy and Governance*, 205–20. Springer, Cham. https://doi.org/10.1007/978-3-319-72026-5_8.

⁵ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuví, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1961

⁶ Ibid.

⁷ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomer, and A. Martínez Blanco (2022). *La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima*. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf, p. 43

Impacts of the climate crisis

An example of the climate impacts mentioned before has been found in the Central American Dry Corridor (CADC) region, which has been one of the areas severely affected by the climate crisis; therefore, some of these impacts will be mentioned below as an example of the consequences of the climate crisis in Central America. The CSC zone extends across the tropical dry forest ecoregion of Central America. Beginning in Chiapas in Mexico, it covers the lowland areas of the Pacific slope and a large part of the central premontane region of Guatemala, El Salvador, Honduras, Nicaragua and part of Guanacaste, Costa Rica; in Honduras it includes areas near the Caribbean Sea coast.⁸ The drought phenomenon occurs cyclically in the area, linked to the El Niño Southern Oscillation (ENSO) period.⁹ Apart from ENSO, generating important Loss and Damage at social, environmental and productive levels¹⁰, the CADC is experiencing a variety of impacts of climate change. Subsequently, two groups of impacts are highlighted: 1) Drought, water deficit, desertification and high temperatures, and 2) Rainfall anomalies, storms and hurricanes.¹¹

1.1 Drought, water deficit, desertification and high temperatures

The field research carried out by La Ruta del Clima in Honduras, Guatemala and El Salvador revealed that the communities located along the CADC experience a recurrent lack of rainfall.¹² The water deficit can be traced back to abnormal rainfall distribution, the ENSO phenomenon and other factors such as deforestation.¹³ As these communities produce mainly for family consumption, the increase in water deficit due to changes in climate increases the risk of malnutrition.¹⁴ 80% of smallholder cereal producers in the CADC are below the poverty line and 30% are in extreme poverty.¹⁵

⁸ Zee, Amparo van der, Jaap van der Zee, Alain Meyrat, Carlos Poveda, and Luis Picado. 2012. "Estudio de Caracterización Del Corredor Seco Centroamericano (Países CA-4)." Honduras.

⁹ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomera, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 10

¹⁰ Ibid.

¹¹ Ibid., p. 17

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid., p. 19

¹⁵ Zee, Amparo van der, Jaap van der Zee, Alain Meyrat, Carlos Poveda, and Luis Picado. 2012. "Estudio de Caracterización Del Corredor Seco Centroamericano (Países CA-4)." Honduras; p. 8-13

Decreased productivity and crop loss caused by droughts and rainfall anomalies have a significant impact on their subsistence crops (beans and corn).¹⁶ On top of that, agricultural crops or fishery products represent the main income of the communities. In other words, if there is no surplus to sell, there would be no money to buy basic or complementary grains for their diet.¹⁷ In summary, it is estimated that 86% of the families in the CADC are in a condition of food insecurity.¹⁸

The instability of the water cycle worries the people interviewed in the research of La Ruta del Clima, because since they were born they have witnessed the agricultural practices carried out as family traditions, but nowadays the intensity and frequency of the rains have changed and this has affected the production processes. For example, based on ancestral knowledge, seeds are sown when the rains begin, for them to nourish the seeds, however, due to changes in the climate, these rains do not follow the expected pattern and as a consequence the plants do not develop properly and the crops die.¹⁹ This generates a change in the community's practices, since they are no longer guided by ancestral knowledge, which causes, in addition to the loss of crops, a loss of cultural heritage.²⁰

In a more general context, Group II of the Intergovernmental Panel on Climate Change (IPCC) highlights in its contribution to the Sixth Assessment Report that climate change would worsen the food insecurity of small and medium farmers and indigenous people in Latin America. In addition to the reduction of suitable agricultural areas and water availability, production yields in the Central American region are predicted to decrease by 19% for beans, 4-21% for corn and 23% for rice due to intensified, more frequent and prolonged droughts as a result of the climate crisis.²¹

Overall, IPCC Group II predicts an increase in water scarcity and competition for water. The disruption of water cycles will significantly degrade ecosystems and affect not only agricultural communities, but also public health and energy production.²² In La Ruta del

¹⁶ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccad Pomer, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 19

¹⁷ Ibid., p. 37

¹⁸ Consorcio de Organizaciones Humanitarias. 2021. "Los Rostros Del Hambre En Centroamérica." Oxfam International; p. 12

¹⁹ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccad Pomer, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 39

²⁰ Ibid., p. 18

²¹ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1692

²² Ibid., p. 1693

Clima's study, it was noted that power outages are already a reality in Honduras, as the 2016 drought drastically affected water levels in dams and thus hydropower production.²³

1.2 Rainfall anomalies, storms and hurricanes

For the CADC, there is a concentration of precipitation in a shorter period than what is normally expected for this zone, which also complicates or makes it impossible to predict the distribution of this precipitation. In addition, tropical storms or hurricanes are increasing due to climate change and are strongly impacting the area, causing serious damage to the infrastructure of the affected communities.²⁴ La Ruta del Clima's research shows that damage to infrastructure complicates and threatens the food security and education of the people affected. For example, when damage is caused to road infrastructure, such as the interruption of streets or roads, the transportation of agricultural production is impeded, with economic consequences due to difficulties in the sale of products that in turn trigger restrictions in the communities' food supply. In addition, this damage to road infrastructure makes it difficult to travel to service centers such as hospitals or schools.²⁵

In the context of identifying technological needs to avoid, minimize and cope with Loss and Damage associated with the effects of climate change, the impacts of tropical cyclones and hurricanes in El Salvador, Honduras, Mexico and Panama stand out. Beyond the CADC, the Central American region in general faces damage to infrastructure caused by floods and landslides as impacts of these extreme hydro-meteorological events. Consequently, there is significant economic damage in the health, education, agriculture and tourism sectors.²⁶ In addition, the climatic factors that cause most migration and displacement are tropical storms and hurricanes, torrential rains, floods and also droughts.²⁷ As a result, Central America is considered one of the most sensitive regions to climate-induced migration and displacement.²⁸

²³ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomera, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 13

²⁴ Ibid., p. 25

²⁵ Ibid., p. 27

²⁶ UNFCCC. (2024). Regional Scoping Workshop on Loss and Damage under the Santiago Network. Summary Report of Latin America and Caribbean Region. Santiago Network 2023. https://unfccc.int/sites/default/files/resource/LAC%20report_27%20November.pdf; p. 15

²⁷ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1691-2

²⁸ Ibid.

Impacts to ocean ecosystems and coastal communities

The climate crisis also impacts Central America's oceanic and coastal ecosystems, e.g. coral reefs, estuaries, mangroves and sandy beaches. These impacts are not limited to the Central American Dry Corridor but cover a wider area of the region.

The reduction of coral richness, density and coverage is one of the main impacts on ocean ecosystems in Central America.²⁹ In addition, temperature alterations have caused the disappearance of several species due to the increase in ocean temperatures.³⁰ Ocean warming, and reduced fish availability greatly impact the development of artisanal fishing and shellfish farming, which represent a major source of income for coastal communities.³¹

Another impact of climate change on coastal communities is sea level rise. Interacting with other effects such as coastal erosion and increased storm surges, three levels of impact to communities can be identified. At the first level, impacts are generated locally such as saltwater intrusion, loss of agricultural land due to flooding, and potential displacement of households. The second level involves responses at the regional or national level in order to respond to the more generalized effects on infrastructure, economy and society. At the third and final level, impacts to coastal areas affect housing and decent living conditions, as they prevent the construction of more housing and cause existing housing in the area to become unsafe, needing the relocation of entire communities.³² It is important to note that the first level already causes important material and immaterial losses, and limits economic development opportunities in these coastal communities.³³

The coastal communities of Cahuita on the Caribbean coast of Costa Rica and Punta Chame on the Pacific coast of Panama are already suffering the impacts of climate change. The effects on biodiversity and alterations in temperature and rainfall put

²⁹ Ibid., p. 1691

³⁰ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccad Pomer, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 21

³¹ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1692

³² UNFCCC. (2024). Regional Scoping Workshop on Loss and Damage under the Santiago Network. Summary Report of Latin America and Caribbean Region. Santiago Network 2023. https://unfccc.int/sites/default/files/resource/LAC%20report_27%20November.pdf; p. 22–23

³³ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccad Pomer, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 31

the communities in a highly vulnerable situation as they rely mainly on fishing, agriculture and tourism for their livelihoods.³⁴

In addition to the panorama described above, the extractive activities present in the territory exacerbate the conditions of vulnerability to experience Loss and Damage.³⁵ This is why communities like the one in Cahuita, from a climate justice perspective, desire a present with ecosystem conversation, where they receive historical reparations for the damages they have faced and are able to strengthen unity and community empowerment.³⁶

³⁴ Guevara T., J. M. G., Douglas, A. I., García-Maraña, K., & Barria, Y. (2022). Determinación de riesgos de desastres e incidencia del cambio climático en la comunidad de Punta Chame, Panamá. In: Revista de Iniciación Científica, 8(2), Article 2. <https://doi.org/10.33412/rev-ric.v8.2.3668>; Rodríguez P., A. M. (2024). Cahuita: Explorando caminos hacia la justicia climática. Producto 5. Informe narrativo y entrega de insumos de investigación. La Ruta del Clima. [Aún no publicado].

³⁵ Rodríguez P., A. M. (2024). Cahuita: Explorando caminos hacia la justicia climática. Producto 5. Informe narrativo y entrega de insumos de investigación. La Ruta del Clima. [Aún no publicado].

³⁶ Ibid.

Non-economic Loss and Damage

In addition to economic damages, the impacts of climate change include non-economic Loss and Damage. Reference was made earlier to changes in water cycles that risk the loss of ancestral knowledge about planting that is part of community culture. In addition to this type of community losses, non-economic Loss and Damage also include, for example, impacts on health or biodiversity.

In terms of health, the IPCC shows how climate change affects the epidemiology of climate-sensitive infectious diseases in Central America. Rising temperatures create ideal conditions for the proliferation of mosquitoes and thus increase the ease of transmission of vector-borne diseases such as Dengue, Chikungunya and Zika.³⁷ A 2015 study estimated that nearly 100,000,000 people in Central America were at risk of contracting the Zika virus, but taking into account temperature increase projections, it is expected that by 2050 this number of people at risk will increase by up to 60%.³⁸ Another problem related to the change in temperature and constant exposure to the sun, together with limited access to drinking water or its contamination, is the increased incidence of kidney diseases.³⁹

On the other hand, more progressive health effects are observed, including psychological impacts of coping with past Loss and Damage or of the constantly uncertainty of living with worry about how to meet their basic food needs. This is particularly the case of many of the affected communities that are barely managing the repercussions of one event when they are affected by the impacts of another, which does not allow them to take sufficient time to process the impacts suffered and recover from them.⁴⁰

³⁷ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1691

³⁸ '¿Más mosquitos transmisores de enfermedades? El cambio climático y el uso de la tierra inciden' (*Web UCR*) <<https://www.ucr.ac.cr/noticias/2023/01/12/mas-mosquitos-transmisores-de-enfermedades-el-cambio-climatico-y-el-uso-de-la-tierra-incident.html>> accessed 22 February 2024.

³⁹ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomera, and A. Martínez Blanco (2022). *La Vida entre Pérdidas y Daños: Narrativas Centroamericanas*. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 20

⁴⁰ Ibid., p. 20; 40

Cultural Loss and Damage include the loss of languages, traditions and social cohesion. La Ruta del Clima's research in the CADC shows that people in Nejapa, San Salvador, lament the loss of the use of the Nahuatl language due to migration from rural areas to the capital.⁴¹

Another impact is seen in the loss of biodiversity, which refers to the decrease or total disappearance of plant or animal species.⁴² These Loss and Damage affect the landscape, tourism and food supply.⁴³ However, the economic and non-economic consequences of climate change do not affect communities uniformly as shown in the next section.

⁴¹ Ibid., p. 36

⁴² Ibid.

⁴³ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomera, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf, p. 36

Vulnerability and inequality in the climate crisis

Deep economic, ethnic and social inequalities are exacerbated by climate change. In addition, high levels of poverty, weak water governance, unequal access to drinking water and sanitation services, and lack of infrastructure and financing reduce adaptive capacity, increasing and creating new vulnerabilities in communities.⁴⁴ Similarly, conflicts over extractivist projects impacting vital spaces and causing an unfair distribution of environmental degradation enhance persistent vulnerabilities.⁴⁵

The climate crisis affects women and men differently. Women, especially those in conditions of poverty, are more vulnerable and suffer the impacts to a greater extent. They often have fewer resources to adapt, which further increases the structural differences between men and women.⁴⁶ Women are responsible for ensuring the survival of the family in most cases. In other words, they tend to carry out activities such as collecting water and food, washing clothes, cleaning the home and caring for their children. All these tasks are affected when there is a climatic event, for example, when there is a drought, women have to dedicate more effort and time to carry out their tasks due to the lack of water, which unables them from carrying out their work.⁴⁷

These effects are not typical of rural areas only, inequality, poverty and informality are also shown in the region's cities and at the same time increase their vulnerability to climate change.⁴⁸ As socio-economic vulnerabilities in rural and urban areas are exacerbated by the effects of climate change, forced migration has been one of the most serious

⁴⁴ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1691

⁴⁵ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomera, and A. Martínez Blanco (2022). *La Vida entre Pérdidas y Daños: Narrativas Centroamericanas*. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 17

⁴⁶ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1692

⁴⁷ Vásquez Rodríguez, A., L. Soto Villalobos, J. Roccard Pomera, and A. Martínez Blanco (2022). *La Vida entre Pérdidas y Daños: Narrativas Centroamericanas*. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf; p. 22

⁴⁸ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1693

humanitarian crises in the region. These are not only weather events, but also droughts and floods which, combined with food insecurity, are leading to a major increase in the displacement of populations.⁴⁹ Climate change is expected to turn these existing risks in the region into increasingly severe risks.⁵⁰

An example of this forced migration is the situation suffered by the community of Guna Yala in Panama, where the rise in sea level caused by climate change has caused islands like this one to be left with less safe territory to inhabit and they are now forced to move to the mainland. This decision to move territory has been very complex to develop in this type of community where there is a very close and important relationship between the population and their lands where they have lived for centuries and which also represent a great natural and cultural wealth for their families and their ancestors. In addition, these situations represent a challenge for governments, since public funds are generally not allocated at the country level to obtain land to relocate populations, which generates delays in the processes and difficulties in implementing urgent actions on forced mobility.⁵¹

⁴⁹ Vásquez Rodríguez, A., L. Soto Villalobos, J. Rocard Pomer, and A. Martínez Blanco (2022). La Vida entre Pérdidas y Daños: Narrativas Centroamericanas. La Ruta del Clima. https://larutadelclima.org/wp-content/uploads/2022/10/Centroamerica-ES_LRC.pdf, p. 28

⁵⁰ Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci, 2022: Central and South America. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1689–1816, doi:10.1017/9781009325844.014; p. 1692

⁵¹ Roberto Martínez Sastre, 'Las migraciones humanas inducidas por el Cambio Climático: Desplazamiento Climático en la Región Autónoma de Guna Yala, Panamá' (Universidad de Administración Pública 2018) <<http://up-rid.up.ac.pa/1591/1/roberto%20martinez.pdf>>.

Identification and management of climate change risks

In the context of climate change, the Latin American and Caribbean region, and especially Central America, faces a considerable level of risk from the occurrence of extreme hydrometeorological phenomena.⁵² Due to insufficient policies for disaster risk management and reduction, vulnerabilities to hydrometeorological events have increased in recent years.⁵³ Since, as mentioned earlier in this document, climate change enhances the intensity and frequency of these extreme hydrometeorological events.

In the Technical Note published by the Inter-American Development Bank (IDB) in 2021, a quantitative and qualitative analysis of the Risk Management Index (RMI) is carried out.⁵⁴ The RMI was developed in 2005 with the aim of making the risk of natural disasters visible and socializing the results among decision-makers to empower Identification of its cause⁵⁵ Assessing the technical, scientific and financial capacity, as well as the civil protection of national and local institutions and the capacity of communities, the RMI examines risk management at the national or local level⁵⁶ Therefore, the RMI makes it possible to reflect and mitigate vulnerabilities in the face of increased risks in the region due to changes in climate. In the latest estimate of the RMI, applied during 2019 and 2020, for the Central American subregion there is a positive average variation of 2% in the value of the RMI. However, in six of the ten countries assessed, the RMI decreases from baseline. This result suggests that risk management performance declined. On the other hand, El Salvador has a notable improvement with an absolute growth of the RMI of 37%⁵⁷ In the case of Costa Rica, the emergency plans that were implemented after Hurricane Nate in October 2017 could be positively evaluated. Even so, setbacks in financial protection have reduced the level obtained in the assessment^{58 59}

⁵² Salgado-Gálvez, M. A., Brenes, A., Jiménez, V., & Tsuneki, H. (2021). Análisis y recomendaciones para la implementación efectiva de la gestión de riesgo de desastres en América Latina y El Caribe: Estudio a través del Índice de Gestión de Riesgo (IGR). Banco Interamericano de Desarrollo. <https://publications.iadb.org/publications/spanish/viewer/analisis-recomendaciones-igr-america-latina-y-el-caribe.pdf>.

⁵³ Ibid., p.1

⁵⁴ Ibid.

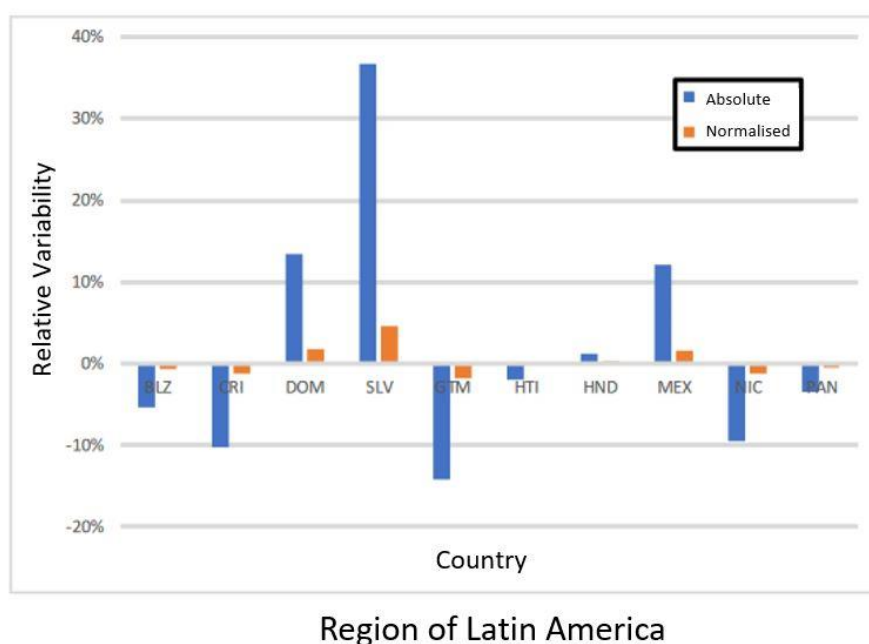
⁵⁵ Ibid., p. 5

⁵⁶ Ibid., p. 5-6

⁵⁷ Ibid., p. 19-20

⁵⁹ Ibid., p. 20

Figure 1. Absolute and relative rate of RMI by country, grouped by subregion⁶⁰



Advances in disaster risk management show a considerable decrease in the number of deaths caused by extreme hydrometeorological phenomena.⁶¹ However, a common denominator in Central American countries is the low level of risk reduction, even though these are areas of mitigable risk.⁶² In addition, disaster risk management is not sufficiently socialized among the population.⁶³ On the other hand, in Costa Rica, for example, there has been a remarkable improvement in terms of monitoring systems for different threats.⁶⁴ For the region in general, challenges persist in the generation and evaluation of updated data as well as in the access to information recorded by national governments. One reason for this is the lack of personnel to process and use the data.⁶⁵ In summary, the sustainability of risk management measures for natural disasters and climate events is strongly linked to public expenditure and the macroeconomic conditions of the countries.⁶⁶

Looking at the aftermath of Hurricane ETA in 2020, the deadly Category 4 hurricane devastated large parts of Central America, totaling Loss and Damage equal to

⁶⁰ Ibid., p. 23

⁶¹ Ibid., p. 55

⁶² Ibid., p. 21

⁶³ Ibid., p. 20

⁶⁴ Ibid., p. 21

⁶⁵ Ibid., p. 20

⁶⁶ Ibid., p. 22

approximately \$225 million.⁶⁷ In 2021, the storm in the Caribbean caused a total of US\$353 million in damages and losses.⁶⁸ Most of these are recorded as damage to road infrastructure as well as alterations in rivers and streams.⁶⁹ In this context, improving the management of disaster risks, increased by the climate crisis, is central to increasing safety and resilience. The Interamerican Development Bank (IDB) technical note recommends that risk identification be advanced by conducting hazard, vulnerability and risk studies using a multi-hazard and probabilistic perspective.⁷⁰ In addition, hazards that were not traditionally included in risk management, but are increasing with climate change, such as coastal erosion, droughts and forest fires, need to be modeled.⁷¹ Even in emergency operations, the IDB stresses the need for a multi-risk approach.⁷² At the financial level, simply having disaster funds is not a solution to quickly access the resources needed for response. As previously indicated, adequate legislation and governance is required to ensure effective risk management and resilient response to a disaster.⁷³

⁶⁷ Comisión Nacional de Prevención de Riesgos y Atención de Emergencias Costa Rica. 2024. Declaratoria de Emergencia Vigentes. ETA Huracan 42705. Anexo 1. Danos y Perdidas por Sector con inclusiones UV. https://cne.go.cr/recuperacion/declaratoria/declaratoria_emergencia_vigentes.aspx [15.02.2024].

⁶⁸ Comisión Nacional de Prevención de Riesgos y Atención de Emergencias Costa Rica. 2024. Declaratoria de Emergencia Vigentes. Temporal Caribe 43131. Anexo 1 con códigos. https://cne.go.cr/recuperacion/declaratoria/declaratoria_emergencia_vigentes.aspx [15.02.2024].

⁶⁹ Ibid.

⁷⁰ Salgado-Gálvez, M. A., Brenes, A., Jiménez, V., & Tsuneki, H. (2021). Análisis y recomendaciones para la implementación efectiva de la gestión de riesgo de desastres en América Latina y El Caribe: Estudio a través del Índice de Gestión de Riesgo (IGR). Banco Interamericano de Desarrollo. <https://publications.iadb.org/publications/spanish/viewer/analisis-recomendaciones-igr-america-latina-y-el-caribe.pdf>; p. 38

⁷¹ Ibid.

⁷² Ibid., p. 39

⁷³ Ibid., p. 40

Conclusion

The Central American region has experienced in recent years a persistent presence of extreme weather events that have impacted the living conditions of those whose economic livelihood depends on the climate, especially agricultural producers and fishermen. Loss and Damage, both economic and non-economic, perpetuate and exacerbate vulnerabilities and the condition of inequality that has historically characterized the territory.

Policies and actions at various scales, as well as the participation of actors from all social groups, including the most exposed and vulnerable populations, are critical elements to achieve effective risk management and adaptation, as well as an adequate response to address the Loss and Damage suffered in the region.

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