Planning

for disaster risk reduction within the framework of the 2030 Agenda for Sustainable Development

Omar Bello
Alejandro Bustamante
Paulina Pizarro

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The views expressed in this document are those of the authors and do not necessarily reflect the views of the Organization.

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Contents

Tables

Figures

Boxes

Diagrams

Maps

Introduction

The Latin American and Caribbean region is prone to disasters. According to the International Disaster Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED), between 1970 and 2019, a total of 2,309 disasters in the region left 510,204 dead, 297 million persons affected and damage amounting to US$ 437 billion (CRED, 2020). Disasters can turn back the clock in terms of the hard-won economic and social ground gained over years of effort by towns or countries. Throughout this study, emphasis will be placed on the geographic dimension of this issue because disasters tend to be localized events, although there are some island nations in the Caribbean where disasters may engulf entire countries, as in the case of Hurricane Irma in 2017, which wreaked havoc throughout Anguilla and Sint Maarten.

A disaster may cause people who have managed to pull themselves out of poverty to fall back into that situation, since the effects of a disaster are magnified among the most vulnerable groups in a population, who may be caught up in a spiral of vulnerability in the wake of an event of this type. People who are below —or just slightly above— the poverty line may be trapped in prolonged cycles of unemployment or underemployment, low productivity and low wages that leave them even more vulnerable to future extreme events. The consequences of disasters are such that there can be no development unless it is a sustainable process and unless resilience is an embedded component of development policy.

Sustainable development paradigms are set out in global frameworks such as the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction 2015–2030. These instruments are designed to guide a coordinated, interlinked, government-led disaster risk management (DRM) effort on the part of the various stakeholders in the development process. DRM must be based on a comprehensive strategy for minimizing the impact and the economic and social effects of disasters by reducing communities' vulnerability to them and by enhancing their coping capacity.

The first pillar of DRM is the identification of disaster risks, and risk assessments are a valuable tool for this purpose. The Economic Commission for Latin America and the Caribbean (ECLAC) has made a number of major contributions in this respect. ECLAC launched the third edition of the *Handbook for Disaster Assessment* in 2014 and carried out an information campaign in 2014–2019 that included 34 in-person national and regional courses for over 1,000 civil servants in Latin America and the Caribbean. This initiative was then replicated at the Economic and Social Commission for Asia and the Pacific (ESCAP)

and the Economic and Social Commission for Western Asia (ESCWA). Then, in 2020, the Latin American and Caribbean Institute for Economic and Social Planning (ILPES) launched the first online version of its course on disaster assessment methodologies. It also conducted 12 disaster assessments that included estimates of the economic and social ramifications of those events. As part of those assessments, the experts identified critical elements such as the availability of appropriate, timely and reliable data and the level of coordination and collaboration among the various institutions concerned. Some of the examples given in this study are based on the Economic Commission's recent experience with disaster assessments.

The principles that underpin the integration of the various dimensions of development are what make it a sustainable process, and those principles, which are mirrored in the 2030 Agenda for Sustainable Development and the Sendai Framework, also inform the adoption of system-based approaches and a fuller understanding of the nature of disaster risk, thereby opening the way for new lines of research, methodologies and opportunities for planning before, during and after a disaster.

While each country is responsible for the national development policies that it pursues within these global frameworks, it is clear that, given the integrality of natural systems, national policies must take impacts beyond each country's borders into consideration. Incorporating DRM into planning systems and processes poses a number of challenges. Development planning must take into account the complex interrelationships existing among various elements (processes, instruments, institutions and stakeholders), and these interrelationships give rise to intertemporal, intersectoral and inter-scale challenges in the coordination and linkage of multiple actors (Máttar and Cuervo, 2017). Similar challenges also arise in DRM planning, since this entails the use of a long-term multisectoral strategy involving different levels of government, the private sector and civil society. National governments have to find ways to integrate their development and DRM planning processes. DRM rests on five pillars: (i) risk identification, (ii) risk reduction, (iii) preparedness, (iv) financial protection and (v) resilient recovery. These pillars are closely interrelated and must be set within a conducive institutional, political, normative and financial environment that permits the allocation of the necessary resources and the appropriate definition of roles and responsibilities (ECLAC, 2019).

The integration of these two processes can help to ensure that the advances made by a given society are resilient in the face of extreme events. Resilience is defined as "the capacity of a system, community or society that is potentially exposed to hazards to adapt [to those hazards] by resisting or changing in order to reach and maintain an acceptable level of functioning and structure" (United Nations, 2005, p. 9). In order to become resilient, a society must identify the disaster risks that it faces and then design and implement measures for reducing those risks (by means of, for example, infrastructure upgrades, land use planning and financial protection measures). Using a rights-based approach to reduce social, economic and environmental vulnerability and to strengthen the population's ability to recover from a disaster and its general well-being are the ultimate goals of DRM. When a country integrates its DRM policy tools with its policy framework, it facilitates the allocation of human, technical and financial resources for attaining those goals.

Any planning process requires indicators for measuring progress towards its agreed goals. This poses another challenge because disaster indicators are not a part of national statistical systems. The 2030 Agenda for Sustainable Development sets out a number of proposed indicators for monitoring progress towards the Sustainable Development Goals, including disaster-related indicators that are aligned with the Sendai Framework. The international community is working to help national statistical offices to construct and tabulate these indicators so that they can monitor the progress being made in DRM and measure it against national goals in this area.

The global instruments mentioned earlier provide frameworks for the systematization and orientation of national strategies. However some countries have been working for years to incorporate DRM schemes into their national development plans but have achieved no more than mixed results. Based on information from the Regional Observatory on Planning for Development in Latin America and the Caribbean, in this study a distinction is drawn between three types of approaches to the incorporation of DRM into

planning instruments: (a) national development plans (or their equivalent) as either an objective, goal or line of action; (b) national DRM strategies; and (c) DRM strategies formulated by local governments. The integration of DRM into planning processes poses formidable challenges for the countries of the region and, now, the disaster triggered by the outbreak of the coronavirus (COVID-19) is posing new types of challenges because it differs in important ways from previous disasters in the region. Since it is a worldwide phenomenon, the response to it has to be mounted in cooperation with other countries, and international organizations have an important role to play in paving the way for that cooperation.

Chapter I of this study sets out the basic definitions of disaster-related concepts and, in order to provide an idea of the scale and scope of the issue, plots out the timeline of disasters that have occurred in the different subregions of Latin America and the Caribbean over the period 1970-2019. It also provides an overview of the main disaster-related components of the 2030 Agenda for Sustainable Development and the Sendai Framework. Chapter II charts out a road map for the incorporation of DRM into national planning systems, tracks the progress made by the countries of the region in this regard and discusses the planning challenges that they face. Chapter III covers the information and statistical systems and the sets of indicators used for DRM. The final chapter presents the study's conclusions and recommendations.

I. Disasters caused by natural phenomena

The EM-DAT of CRED defines a disaster as a "situation or event which overwhelms local capacity, necessitating a request to national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering. Though often caused by nature, disasters can have human origins" (CRED, 2020). The term "natural disaster" is used to differentiate disasters caused by natural phenomena from technological disasters (such as oil spills, airplane crashes, etc.).

In order for a disaster to be entered into the EM-DAT database (CRED, 2020), at least one of the following criteria must be met:

- Ten or more people reported killed
- One hundred or more people reported affected
- Declaration of a state of emergency
- A call for international assistance.

Disasters are caused by a combination of the following factors:

(a) Exposure to natural phenomena capable of triggering processes that cause physical damage and a loss of human lives and assets; and

(b) The vulnerability of people and human settlements.

A disaster is caused by the convergence of these two elements. It is therefore important to study natural phenomena, but it is even more important to analyse policies that can reduce vulnerability, as this is the way in which public action can help to reduce disaster risk.

Natural phenomena with the potential to cause destruction in a given area are referred to as "hazards". In this context, a hazard is defined as a "threatening event, or probability of occurrence of a potentially damaging phenomenon within a given time period and area" (CRED, 2020). The classification of extreme events, by origin, is shown in table I.1.

Table I.1
Classification of extreme natural events used by the EM-DAT International Disaster Database of the Centre for Research on the Epidemiology of Disasters

Subgroup	Definition	Type of disaster
Geophysical	A hazard originating from solid earth. This term is used interchangeably with the term geological hazard.	Earthquake Mass movement (dry) Volcanic activity
Meteorological	A hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days.	Extreme temperature Fog Storm
Hydrological	A hazard caused by the occurrence, movement and distribution of surface and subsurface freshwater or saltwater.	Flood Landslide Wave action
Climatological	A hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability.	Drought Glacial lake outburst Wildfire
Biological	A hazard caused by the exposure to living organisms and their toxic substances (e.g. venom, mould) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants and mosquitoes carrying disease-causing agents such as parasites, bacteria or viruses (e.g. malaria).	Epidemic Insect infestation Animal accident
Extraterrestrial	A hazard caused by asteroids, meteoroids and comets as they pass near the Earth, enter the Earth's atmosphere and/or strike the Earth and by changes in interplanetary conditions that affect the Earth's magnetosphere, ionosphere and thermosphere.	Impact Space weather

Source: Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

Vulnerability is thus a pre-existing condition that makes it possible for a natural hazard to become a disaster. It involves not only the quality of infrastructure and its location, but also social factors of vulnerability, such as income inequality and poverty.

The United Nations Office for Disaster Risk Reduction (UNDRR) defines disaster risk as: "The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity."

The Damage and Loss Assessment (DALA) methodology developed by ECLAC is the most commonly used method for disaster assessments (ECLAC, 2014). ECLAC was the first institution in the region to invest time and resources in disaster assessments and in the development and dissemination of a methodology for this purpose. It was first used by ECLAC to assess the economic impact of the 1972 Managua earthquake and was most recently applied in the assessment of the impact of Hurricane Dorian, which devastated the Bahamas on 1 and 2 September 2019 (see box I.1).[1]

Damage is assessed as the monetary value of physical assets that have been partially or totally destroyed. For example, in the specific case of an earthquake, the damage is caused at the time that the event occurs and is assessed on the basis of the value of the asset at that point in time. If a hospital that was built 10 years earlier is destroyed, the materials that went into its construction and their depreciation are taken into account. The computations do not use the cost of its reconstruction, since this would include disaster risk reduction measures, possible relocation and technological upgrades.

[1] Since 1972, ECLAC has headed up efforts to assess more than 100 disasters in over 28 countries and territories in Latin America and the Caribbean.

Box I.1
Hurricane Dorian

28 January 2019 4 September 2019

Aerial photographs of sandbanks in the northern part of Abaco Island in the Bahamas before and after the passage of Hurricane Dorian.

Source: Economic Commission for Latin America and the Caribbean (ECLAC)/Inter-American Development Bank (IDB), *Effects and impacts of hurricane Dorian in the Bahamas,* 2020, forthcoming.

In September 2019, Hurricane Dorian—one of the most powerful storms ever recorded—swept over the Bahamas, leaving a path of destruction in its wake. Homes and essential infrastructure were ruined and entire ecosystems were devastated, and huge investments will be required for the recovery effort. The economy and people's livelihoods will be adversely affected for years to come owing to the interruption of economic flows caused by the damage, especially in the case of the tourism and fisheries sectors. It will take the Bahamas a long time to rebuild, and it will need external financial support in order to do so. The main findings of the disaster assessment undertaken by the Economic Commission for Latin America and the Caribbean (ECLAC) and the Inter-American Development Bank (IDB) were:

(i) The total cost of the immediate impact and subsequent effects of Hurricane Dorian are estimated at US$ 3.4 billion (25% of the Bahamas' gross domestic product (GDP)); 72% of that figure corresponds to damage, 21% to losses and 7% to additional costs. The effects of the disaster in the private sector account for 88% of that total.

(ii) The housing sector was the hardest hit, while the biggest losses were sustained by the tourism industry.

(iii) The estimated impact of Hurricane Dorian is equivalent to a full percentage point of the Bahamas' GDP and to a US$ 51.3 million reduction in wages and a US$ 60.9 million drop in capital revenues.

(iv) At a more local level, the results differ. For Abaco Island, the impact is estimated at the equivalent of 7.3% of GDP, which translates into decreases of 47% and 60% in returns from labour and capital, respectively. In Grand Bahama, on the other hand, the impact was equivalent to 2% of that island's GDP.

Source: Prepared by the authors, on the basis of Economic Commission for Latin America and the Caribbean (ECLAC)/Inter-American Development Bank (IDB), *Effects and impacts of hurricane Dorian in the Bahamas,* 2020, forthcoming.

Loss is assessed as the monetary value of goods that are not produced and/or services that are not provided. Losses occur over the timespan that starts when the disaster strikes and ends when conditions return to normal. These losses are estimated as forgone gross income, not earnings. ECLAC (2014) has also added the heading of "additional costs", which include all the public and private expenditures made in order to provide goods and services on a temporary basis in the aftermath of a disaster. Damage, losses and additional costs, taken together, are the basis for estimating the total cost of a disaster.

The totals for these categories (damage, losses and additional costs) are estimated on the basis of sectoral and local information. At the sectoral level, the Commission's DALA methodology divides the available information into social, infrastructure and production sectors.[2] Since disasters are localized in nature, these categories need to be expressed in terms of a country's political and/or administrative divisions. For example, in assessing the fallout from Hurricane Dorian in the Bahamas, the damage, losses and additional costs were estimated by sector and were delimited at the subnational level for the severely impacted islands (Grand Bahama and Abaco).

Using this approach, "coping capacity" is understood as the combination of all the strengths, attributes and resources that organizations, communities or society can draw upon to manage and reduce disaster risks and build resilience. This can include infrastructure, institutions, knowledge and skills, as well as collective attributes such as social relations, leadership and management capacity.

Disasters may occasion different types of losses, many of which may be difficult to quantify. By drawing on the available knowledge about prevailing hazards and about population and socioeconomic development patterns, however, disaster risks can be evaluated and mapped, at least in general terms.[3]

These definitions make it clear that natural hazards are unavoidable. The steps that can be taken to manage those risks include identifying and understanding them and determining how likely they are to occur (insofar as possible), where they are likely to occur and what their potential impact may be. Accordingly, where risk reduction efforts are the most crucial is in the management of vulnerabilities. Planning can play a pivotal role in identifying vulnerabilities and making use of the available tools (e.g. development and risk management plans, urban planning, land use planning and building codes) and processes (e.g. intersectoral coordination, policy coherence and linkages among a range of stakeholders) to mitigate risk and build resilience. These aspects will be dealt with in greater detail in the following section.

A. The global outlook

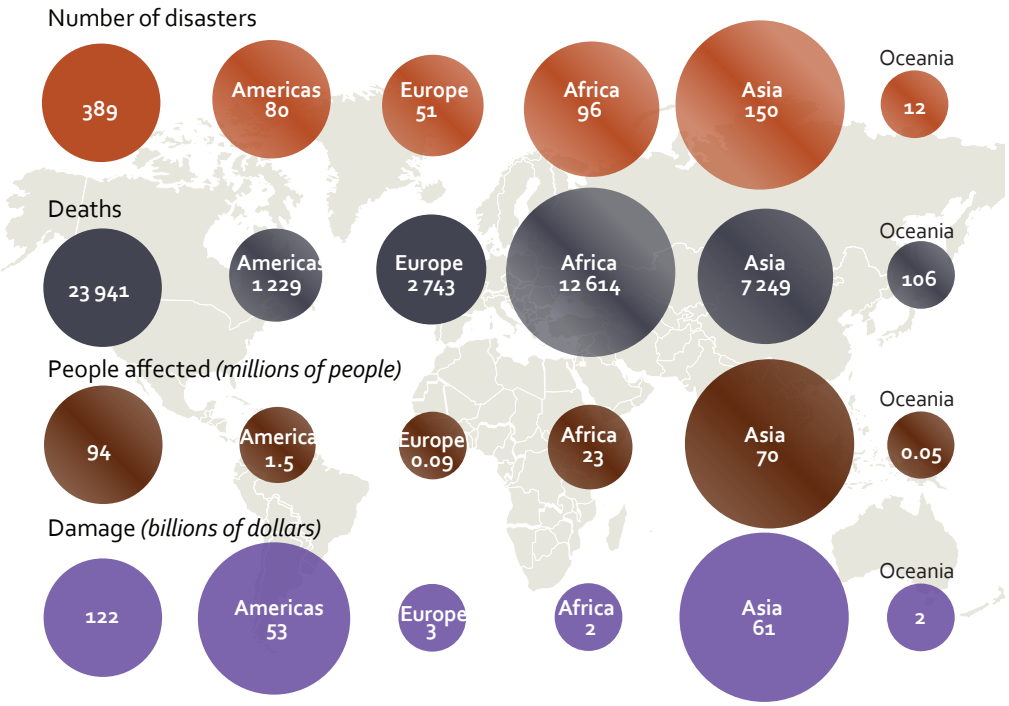
According to the EM-DAT of CRED, in 2019 a total of 389 disasters caused by natural phenomena around the world left nearly 24,000 people dead, another 94 million affected and damages estimated at some US$ 122 billion (CRED, 2020) (see diagram I.1). Africa was the continent that was hit the hardest in terms of lives lost, with 12,614 deaths (53% of the total). This was almost four times as many deaths as had been caused by natural disasters in that continent the year before and was equal to all deaths caused by natural phenomena in the entire world during that year. The causes of this spike were primarily the measles and cholera epidemics that killed more than 9,800 persons in 2019. Asia was the continent that had the largest number of disasters (150, or 39% of the total), the most people affected (69.6 million people, or 74% of the total) and the one that sustained the most damage (US$ 61.5billion, or 50% of the total).

Globally, epidemics were the cause of the greatest number of deaths (51% of the total), followed by floods (21% of the total). Extreme events such as storms, floods and droughts affected over 90 million people throughout the world (97% of the total affected population). The most damage (US$ 58 billion) was caused by storms, followed by floods (US$ 36 billion) and forest fires (US$ 26 billion), with these three causes accounting for 98% of all damage caused by disasters during that period (CRED, 2020).

[2] In this methodology, social sectors are divided into education, health and housing; infrastructure is divided into the sectors of transportation routes, electricity, telecommunications, and water and sanitation; and the production sector is divided into commerce, manufacturing, tourism and agriculture.

[3] For detailed descriptions of disaster-related concepts, see [online] https://emdat.be/Glossary; https://www.undrr.org/terminology.

Diagram I.1
Disasters: occurrence, deaths, population affected and damage, 2019



Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

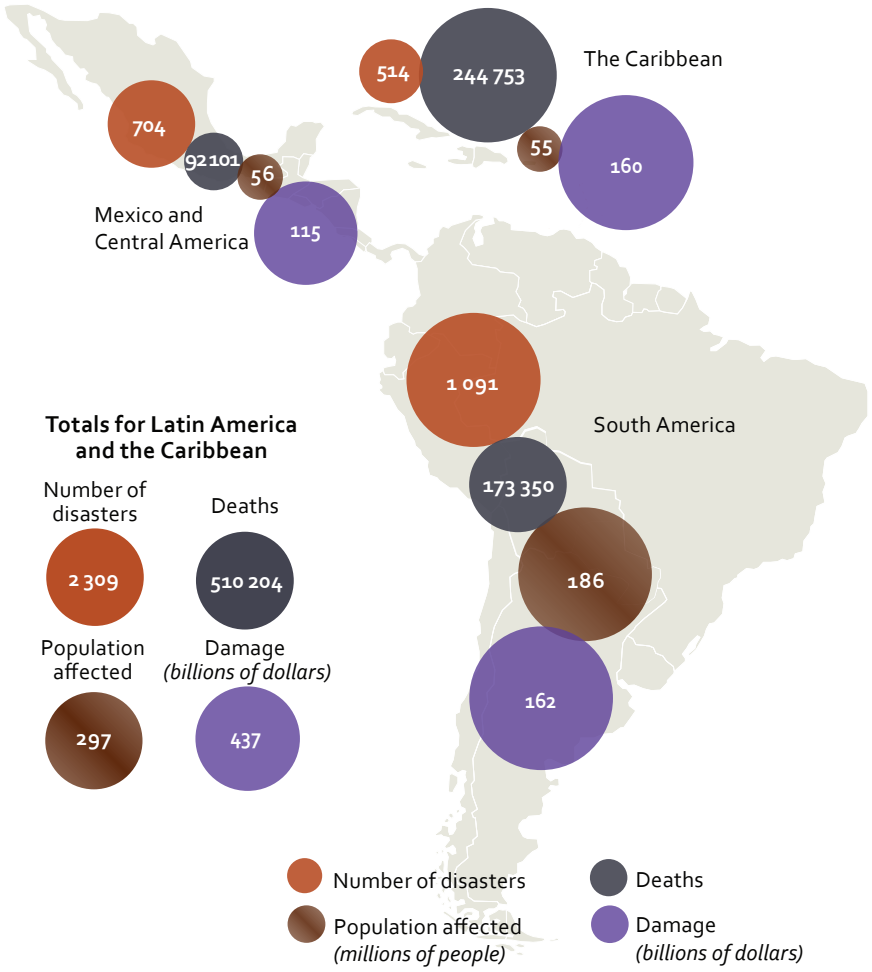
The effects of climate change, as reflected in increasingly frequent and intense extreme natural events (with this upward trend expected to continue in coming years), are an important consideration in disaster management. As Laybourn-Langton, Rankin and Baxter (2019) observe, human beings' adverse impact on the environment is not confined to climate change but instead also extends to other natural systems, giving rise to a complex dynamic of environmental destabilization that has already reached critical levels. This destabilization is occurring on a scale and at a speed never seen before in humanity's history and is being manifested in phenomena such as the following:

- The 20 hottest years since records began to be kept in 1850 have occurred in the past 22 years, with the past four years being the hottest ever recorded
- Global vertebrate populations have fallen by an average of 60% since the 1970s
- More than 75% of the Earth's land surface is substantially degraded
- Since 1950, changes in many extreme weather and climate events have included an increase in the frequency of heat waves over large parts of Europe, Asia and Australia and in the frequency or intensity of heavy precipitation events in North America and Europe
- Extinction rates have risen to between 100 and 1,000 times the background extinction rate
- Topsoil is now being lost 40 times faster than it is being replenished by natural processes and, since the mid-20th century, 30% of the world's arable land has been rendered unproductive by erosion; if this trend continues, 95% of the Earth's land area could become degraded by 2050.

B. Regional outlook

According to CRED (2020), between 1970 and 2019, the Latin American and Caribbean region witnessed 2,309 disasters (see map I.1)[4] that killed 510,204 people, affected another 297 million and caused damage amounting to more than US$ 437 billion. The deadliest disaster during this period was the earthquake that jolted Port-au-Prince on 12 January 2010, taking a toll of 222,570 lives. With its exposure and vulnerability to such a wide range of natural and human-induced hazards, the Latin American and Caribbean region is the second-most likely to be hit by disasters, after Asia.

Map I.1
Latin America and the Caribbean: disasters, by subregion, 1970-2019



Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

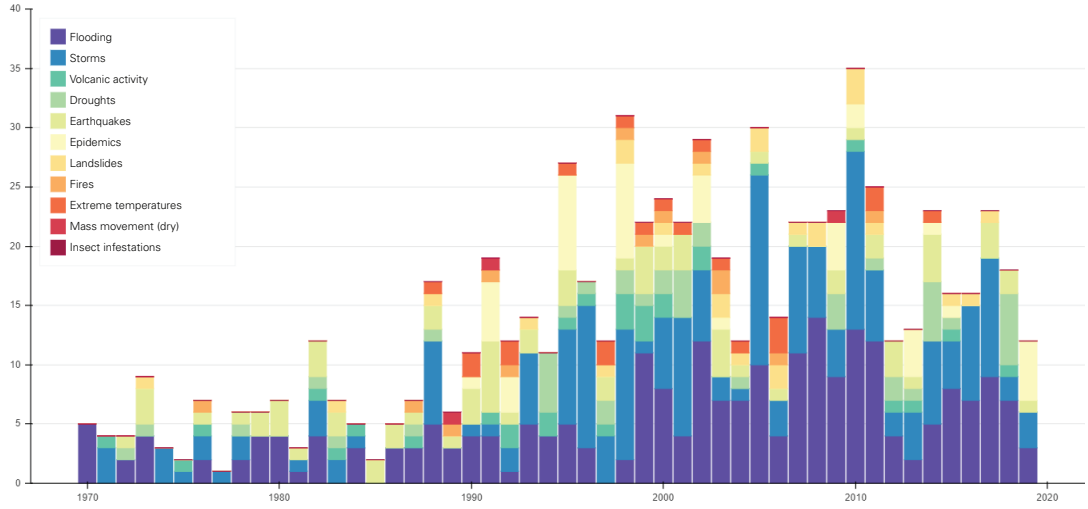
[4] For the purposes of this study, the Caribbean subregion has been defined in geographic terms and therefore includes the English- and French-speaking Caribbean countries plus Puerto Rico and the Dominican Republic. Belize, Guyana, French Guiana and Suriname are not included. Belize is classified as part of Central America, while Guyana, French Guiana and Suriname are classified as part of South America. This is because geography is a defining factor in terms of disaster management. The pattern of disasters in Belize, for example, is more similar to that of the Central American countries than it is to the island countries of the Caribbean, and the profiles of Guyana and Suriname are more like those of the northern part of South America than those of the Caribbean islands. Disaster profiles are, ultimately, geographically rather than culturally determined.

At the subregional level, a majority (53% of the total) of these disasters took place in Mexico and Central America and in the Caribbean, and they were also the most severe events in terms of deaths (66%) and damage (62%). The earthquakes that hit Guatemala (1976), Nicaragua (1972) and Haiti (2010) caused damage equivalent to around 98.82% and 120% of their nominal GDP, respectively.

1. Central America and Mexico

In the subregion of Central America and Mexico, the most frequent causes of disasters were floods (34%) and storms (28%) (see figure I.1).

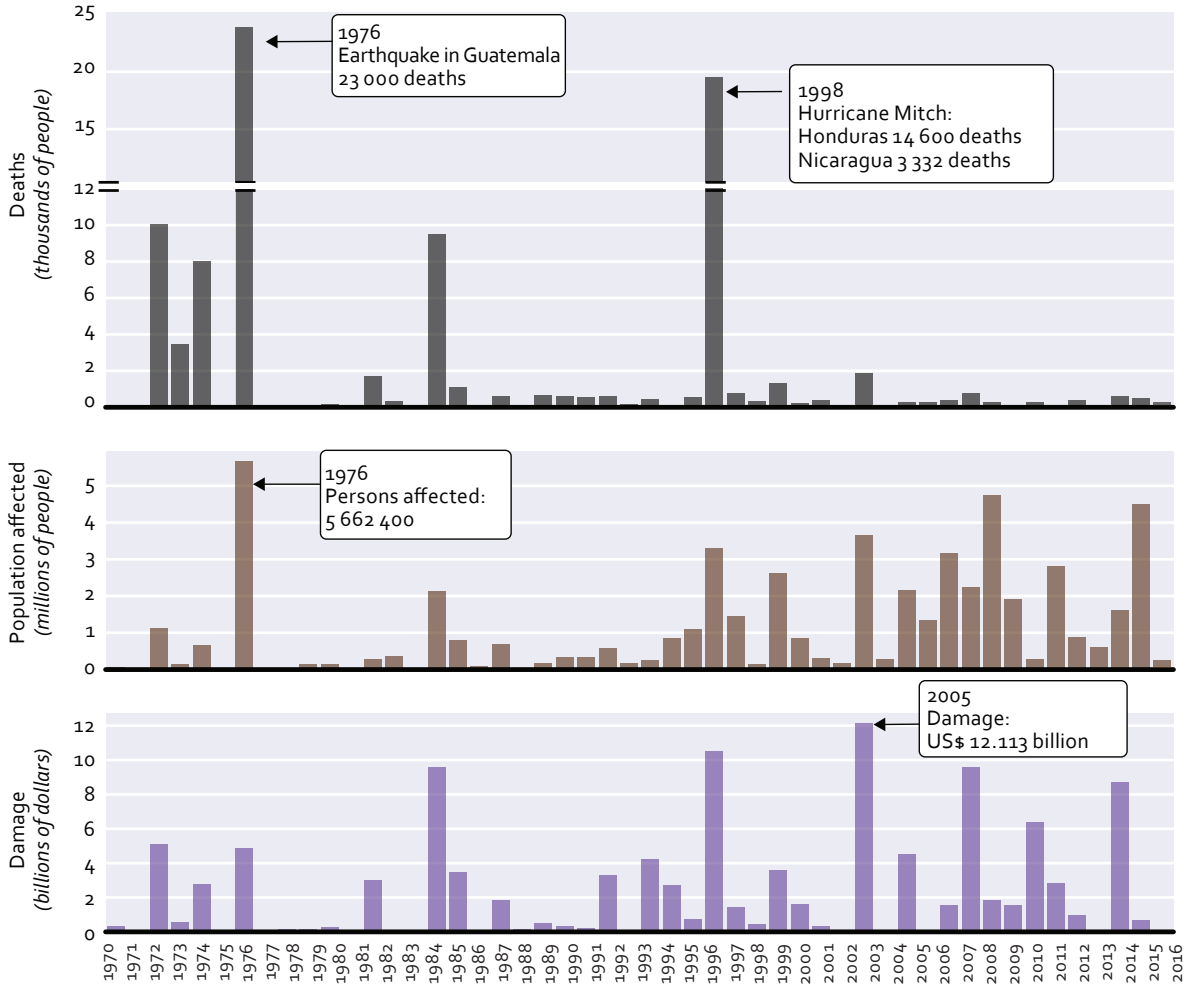
Figure I.1
Central America and Mexico: disasters, 1970-2019
(Number of events per year)



Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

The largest number of deaths occurred in the 1970s (see figure I.2). The deadliest disasters were the earthquake that hit Los Amates, Guatemala, on 4 February 1976, which killed 23,000 people, and the Managua earthquake of 23 December 1972, in which 10,000 people died. In the 1980s, there were another two major earthquakes: in Mexico City on 19 September 1985, with a death toll of 9,500 people, and in San Salvador on 10 October 1986, in which 1,100 persons lost their lives. In the 1990s, the deadliest disaster was Hurricane Mitch, which killed 14,600 people in Honduras. The record for the most persons affected by a disaster in 1970-2019 was set in 1976, with more than 5 million people affected, while the record high in terms of damage was registered in 2005 (US$ 12,113,000,000).

Figure I.2
Central America and Mexico: deaths, population affected and damage caused by disasters, 1970-2019

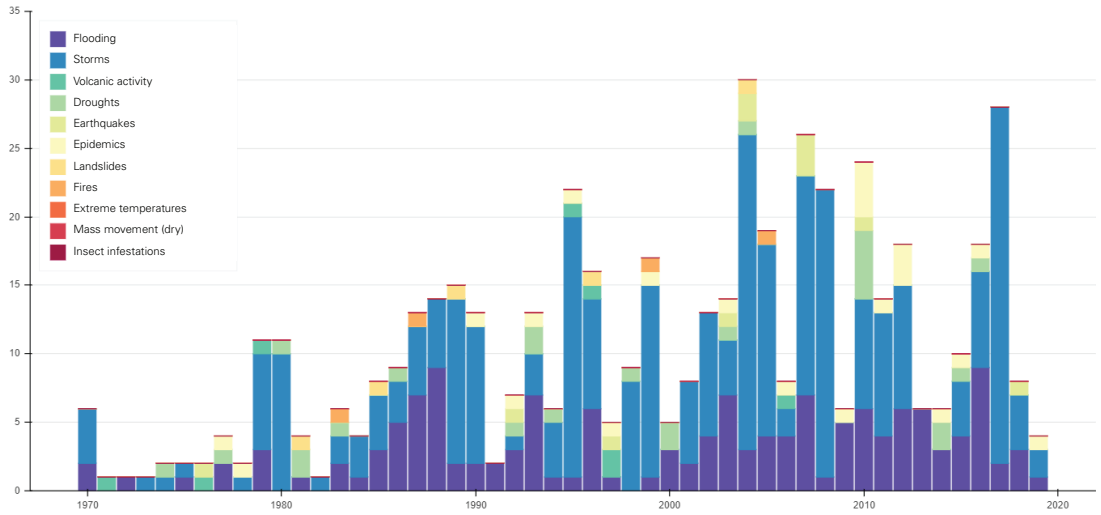


Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

2. The Caribbean

The large number of natural hazards found in the Caribbean and the fact that the population is concentrated along the coasts are two of the factors that make the Caribbean one of the areas of the world in which disasters have the greatest impact. Between 1970 and 2019, a total of 514 disasters took place in the subregion, with 91.7% of them having their origin in meteorological or hydroclimatic phenomena such as droughts, floods, storms and tropical cyclones (see figure I.3). One of the exceptional features of the Caribbean is that disasters may engulf an entire country and, in relative terms, be of a magnitude that outstrips that of any other region. For example, during the 2017 hurricane season, the total cost of the destruction wreaked by Hurricane Irma and Hurricane María in the British Virgin Islands and Sint Maarten exceeded 100% of the gross domestic product (GDP) of those countries. The consequences of a disaster of that magnitude will be felt for years after the actual event. The assessment conducted by ECLAC as a joint effort with the Inter-American Development Bank (IDB) and the Pan American Health Organization (PAHO) indicates that the worst disaster to hit the region in 2019 was Hurricane Dorian (see box I.1).

Figure I.3
The Caribbean: disasters, 1970-2019
(Number of events per year)

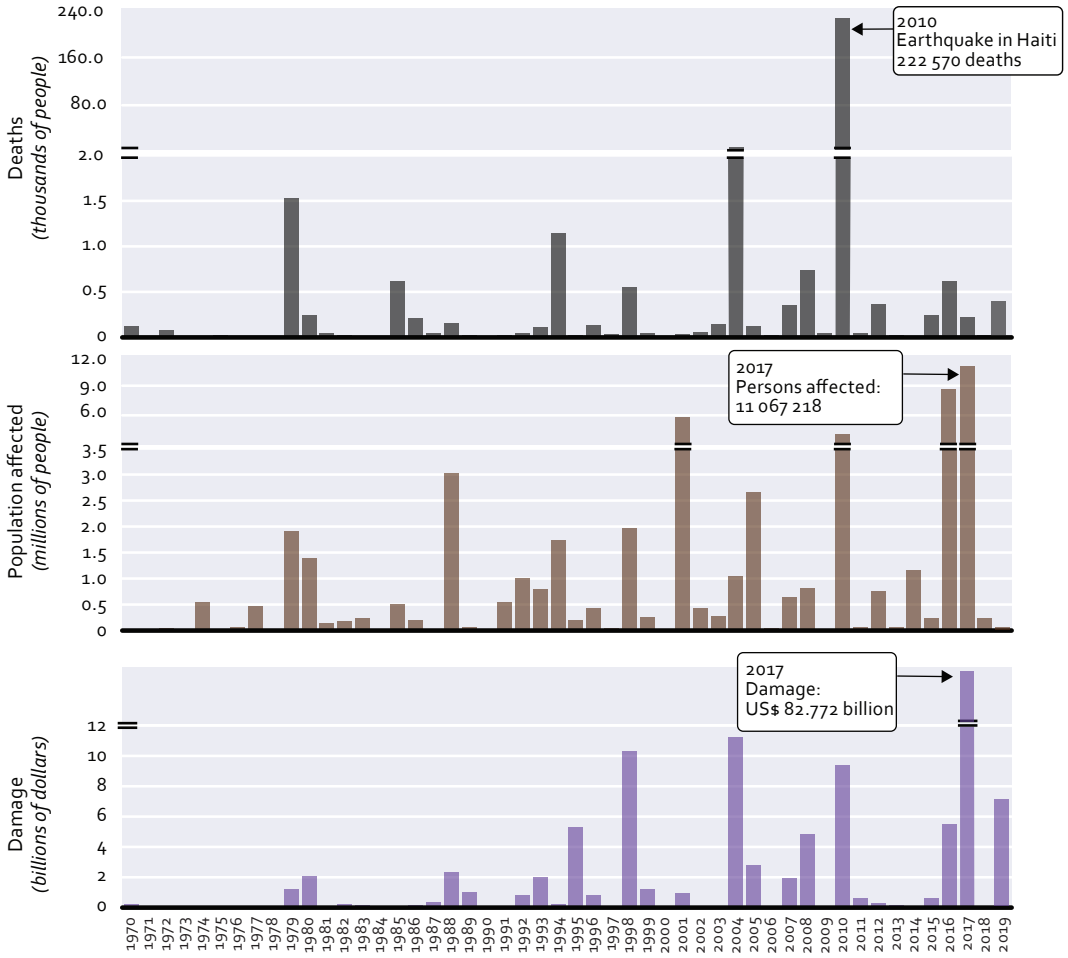


Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

Small island developing States are already feeling the effects of climate change and will be faced with the greatest costs if projections of the rise in sea levels turn out to be accurate. Information from the EM-DAT International Disaster Database indicates that the average number of disasters per decade in the Caribbean has climbed significantly since the 1970s, as have the number of people affected and the amount of damage (CRED, 2020) (see figure I.4). These events heighten pre-existing vulnerabilities and social inequalities and have a disproportionately severe impact on women, children, older adults, persons with disabilities and poor and marginalized populations.[5]

[5] See ECLAC (2019).

Figure I.4
The Caribbean: deaths, population affected and damage caused by disasters, 1970-2019



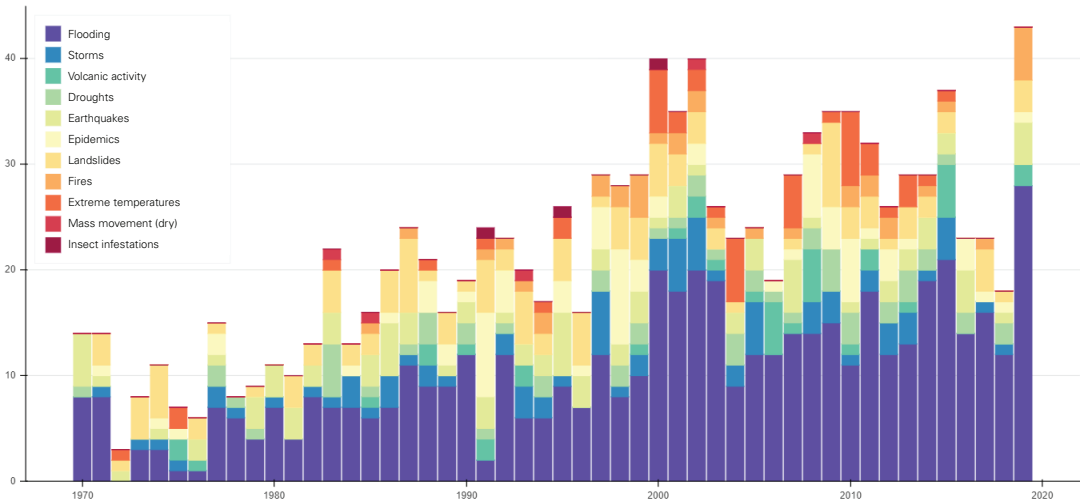
Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

3. South America

In the subregion of South America, floods are the most frequent type of disaster (48%) (see figure I.5). The deadliest flood was the one that occurred in December 1998, in Vargas State, Bolivarian Republic of Venezuela, which killed over 30,000 people. Earthquakes have been the second-most common type of disaster, accounting for 9% of all extreme events. The earthquake that hit the Ancash Province of Peru on 31 March 1970 left over 66,000 dead and was the worst disaster in the subregion.

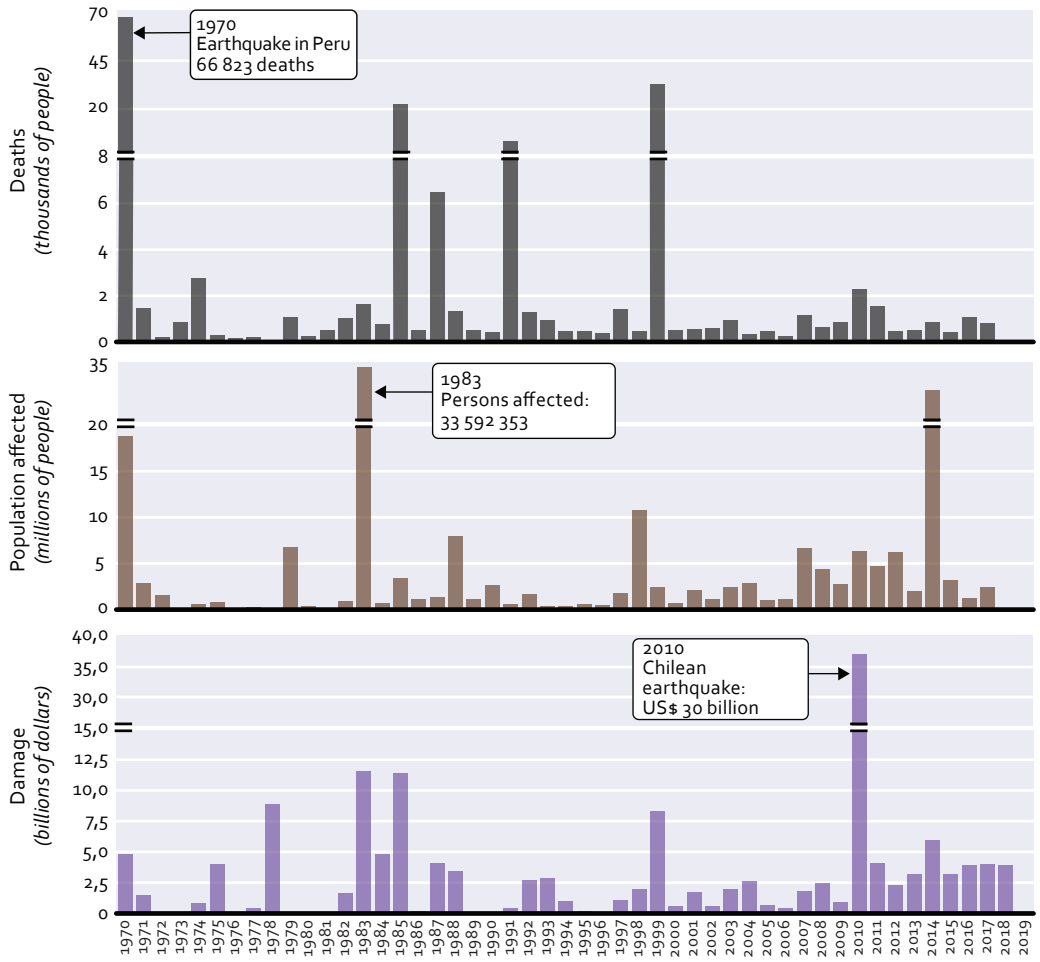
The two worst disasters in the 1980s were the eruption of the Nevado del Ruiz volcano in Colombia on 13 November 1985 and the subsequent lahars, which took a toll of 21,800 lives, and the earthquake of 5 March 1987 in Ecuador, which killed 5,000 people (see figure I.6). In 1991, a cholera epidemic in Peru led to the loss of 9,726 lives.

Figure I.5
South America: disasters, 1970-2019
(Number of events per year)



Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

Figure I.6
South America: deaths, population affected and damage caused by disasters, 1970-2019



Source: Prepared by the authors, on the basis of Centre for Research on the Epidemiology of Disasters (CRED), EM-DAT International Disaster Database, 2020 [online] https://www.emdat.be/.

In the 2010s, the most catastrophic events in terms of loss of life were the Muisne-Pedernales earthquake in Ecuador, which occurred on 16 April 2016 and killed 673 people, and the 2010 earthquake in central Chile, which caused 562 fatalities. The damage caused by the Chilean quake accounted for 49% of all disaster-related damage recorded during the entire decade.

The region is therefore faced with the enormous challenge of pursuing its development process while at the same time having to adapt to the effects of climate change, mitigate disaster risk and reduce its vulnerability to extreme events of that sort (ECLAC, 2018a).

C. Global frameworks

As the region is confronted with increasing hazards, risks and vulnerabilities, it is also confronted with the challenge of transitioning from an approach that emphasizes emergency response capabilities to one that revolves around disaster risk management (DRM). This entails shifting from one paradigm to another, from conventional forms of hazard management to a deeper understanding of systemic risks and their dynamic interactions. An awareness of the dynamics between sustainable development and disasters underlies global instruments formulated by the international community, such as the 2030 Agenda for Sustainable Development and the Sendai Framework, that can guide government-led, coordinated DRM efforts on the part of the various development actors.

The principles of comprehensiveness that underpin sustainable development, which are mirrored in the 2030 Agenda for Sustainable Development and the Sendai Framework, also encourage the adoption of system-based approaches and a fuller understanding of the nature of disaster risk, thereby opening the way for new lines of research, methodologies and opportunities for planning before, during and after a disaster.

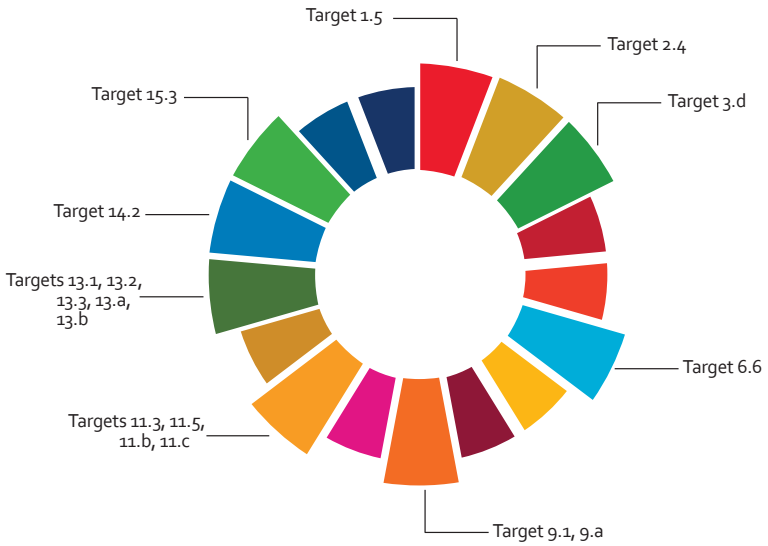
1. The 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development places a great deal of importance on disaster risk reduction (DRR) as a key element in the achievement of the Sustainable Development Goals and makes explicit reference to the interactions between disasters and poverty, the availability of food, access to health care, the water supply, infrastructure, urban development, climate change and the preservation of ecosystems. In the pursuit of the Goals, the 2030 Agenda proposes concrete commitments to reduce vulnerability, build capacity and promote resilience to disasters (see diagram I.2).

As is made evident by the 2030 Agenda, disaster risk influences a number of different dimensions of development. Targets included in 9 out of the 17 Sustainable Development Goals of the 2030 Agenda are directly related to DRM, and many of the other targets allude to the importance of disaster management as a pivotal element in development.

The 2030 Agenda for Sustainable Development acknowledges and reaffirms the urgent need to reduce disaster risk. As noted earlier, a major disaster can erase the economic and social progress that has taken a country years to achieve and may jeopardize that society's ability to pursue a sustainable development process. This is why it is essential for any sustainable development strategy to incorporate DRM considerations.

Diagram I.2
Targets of the 2030 Agenda for Sustainable Development and their linkage to disaster risk management



Target	Subject
1.5	Build resilience and reduce vulnerability to extreme events
3.d	Strengthen capacity for early warnings of national and global health risks
9.1	Develop resilient infrastructure
11.3	Enhance inclusive and sustainable urbanization and planning
11.b	Develop and implement DRM measures in cities and human settlements
13.1	Strengthen resilience and adaptive capacity to climate-related hazards and disasters
13.3	Improve education on climate change and the associated risks
13.b	Raise capacity for climate-change-related planning and management
15.3	Restore degraded land and soil affected by desertification, drought and floods

Target	Subject
2.4	Ensure sustainable food production systems that strengthen capacity for adaptation to climate change and disasters
6.6	Protect water-related ecosystems
9.a	Facilitate financial, technological and technical support for the development of resilient infrastructure
11.5	Reduce the deaths and economic losses caused by disasters
11.c	Provide technical and financial assistance for sustainable and resilient construction
13.2	Integrate climate change measures into national policies, strategies and planning
13.a	Mobilize funds for climate change mitigation and adaptation
14.2	Manage and protect marine ecosystems to avoid significant adverse impacts

Source: Prepared by the authors.

2. The Sendai Framework for Disaster Risk Reduction 2015–2030

The Sendai Framework sets out seven global targets for the prevention and reduction of disaster-related losses and is an instrument of pivotal importance for the achievement of the Sustainable Development Goals. It represents a paradigm shift from an understanding of disaster risk to an approach to risk management as an inherent part of economic, social and environmental activity. Its seven global targets are paired with a long list of guiding principles for reducing the impact of disasters while addressing underlying disaster risk factors (hazards and vulnerabilities) and for safeguarding the benefits of development for current and future generations. Within this context, the transition to resilient, sustainable societies is seen as hinging upon responsible DRM.

The outcome sought by the Sendai Framework is "the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries" by 2030 (United Nations, 2015b, p. 6). It also states that steps must be taken to:

> Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience (United Nations, 2015b, p. 6).

In addition to its seven global targets (see box I.2), the Framework identifies four priority areas for action in strengthening resilience by preventing new disaster risks from arising and reducing existing risks. These four priority areas are:

(i) **Understanding disaster risk.** DRM policies and practices should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be leveraged for the purpose of pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to disasters (United Nations, 2015b, p. 9).

(ii) **Strengthening disaster risk governance to manage disaster risk.** Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk. Clear vision, plans, competence, guidance and coordination within and across sectors, as well as participation of relevant stakeholders, are needed. Strengthening disaster risk governance for prevention, mitigation, preparedness, response, recovery and rehabilitation is therefore necessary and fosters collaboration and partnership across mechanisms and institutions for the implementation of instruments relevant to DRR and sustainable development (United Nations, 2015b, p. 11).

(iii) **Investing in DRR for resilience.** Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost-effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation (United Nations, 2015b, p. 14).

(iv) **Enhancing disaster preparedness for effective response and to "build back better" in recovery, rehabilitation and reconstruction**. The steady growth of disaster risk, including the increasing exposure of people and assets, combined with the lessons learned from past disasters, points to the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate DRR in response preparedness and ensure that capacities are in place for effective response and recovery at all levels. Empowering women and persons with disabilities to publicly lead and promote gender-equitable and universally accessible response, recovery, rehabilitation and reconstruction approaches is key. Disasters have demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared for ahead of a disaster, is a critical opportunity to "build back better", including through integrating DRR into development measures and making nations and communities resilient to disasters (United Nations, 2015b, p. 16).

Box I.2
The global targets of the Sendai Framework for Disaster Risk Reduction 2015–2019

A. Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015;
B. Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015;
C. Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;
D. Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030;
E. Substantially increase the number of countries with national and local DRR strategies by 2020;
F. Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030;
G. Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

Source: United Nations, *Sendai Framework for Disaster Risk Reduction 2015–2030* (A/RES/69/283), New York, 2015.

The 2030 Agenda for Sustainable Development and the Sendai Framework are not the only international instruments for the adoption of an integrated approach to risk reduction and development. Rather, they are part of a series of internationally negotiated agreements concluded in 2015–2016. These instruments also include the Paris Agreement, which serves as a cornerstone for sustainable, low-carbon, resilient development within the context of climate change; the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, which outlines a series of fiscally sustainable and nationally appropriate measures for realigning financial flows with development goals and reducing structural risks as a means of promoting inclusive growth; and the New Urban Agenda adopted by the United Nations Conference on Housing and Sustainable Urban Development (Habitat III), which incorporates a new urban development model designed to foster equity, well-being and prosperity.

The 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction 2015–2030 provide guidance for countries' efforts to strengthen their planning processes so that they can find ways of reducing their exposure and vulnerability to disasters and thus a way forward towards sustainable development. The attainment of the Sustainable Development Goals will, in large part, hinge on making headway in the implementation of strategies for reducing disaster risk. Hence the need to strengthen political commitments, to promote investment in risk reduction and to incorporate disaster resilience into sustainable development planning processes (ECLAC, 2018a).

II. Sustainable development planning and disaster risk management

For countries that are highly exposed and vulnerable to natural events, a disaster can present a critical obstacle to sustainable development. According to the World Risk Index (Birkmann and others, 2011, and Welle and Birkmann, 2015), which gauges countries' exposure and vulnerability to risks associated with natural events, over 60% of the countries of Latin America and the Caribbean are subject to somewhere between a medium and very high level of disaster risk, and over half of that group of countries is at a high or very high risk level (ECLAC, 2018a). In countries where disaster risk levels are high, a single event may result in a catastrophic situation that can wipe out the progress made up to that point and have a systemic impact on various dimensions of the development process.

Impacts are often much greater among the most vulnerable groups—people living in poverty, the unemployed and underemployed, persons with disabilities, women and girls, displaced persons and migrants, young people, indigenous peoples and older adults—and, in the aftermath of a disaster, these people "...may be caught in protracted cycles of unemployment and underemployment, low productivity and low wages and are particularly vulnerable to extreme weather [events]" (UNDRR, 2019, p. 147). The increased exposure of human activity to disasters heightens the likelihood of systemic impacts that can trigger vicious cycles of cascading impacts on human, economic, political and environmental systems that are difficult to predict. In these more complex scenarios, risks become increasingly systemic in nature.

Poverty, urbanization, weak governance, deteriorating ecosystems and climate change are just some of the critical disaster risk factors to be found worldwide. In addition to the broader ramifications of climate change, there are sectoral development dynamics that heighten risk, such as the development of tourism infrastructure in hazard-prone coastal areas, as is occurring in the Caribbean, and the planting of water-intensive crops in drylands, as is being done in the northern part of central Chile. Development patterns that exacerbate existing inequalities generate more poverty and exclusionary social and political processes, which also increase disaster risk. Social justice and equality are fundamental factors in achieving a form of development that is resilient to disasters and climate change because they ensure that options, views and values will be weighed and debated among and within countries and communities without worsening the situation of the most underprivileged groups in society.

A. Development planning

While attending the World Economic Forum in Davos in January 2019, António Guterres, Secretary-General of the United Nations, said, "If I had to select one sentence to describe the state of the world, I would say we are in a world in which global challenges are more and more integrated, and the responses are more and more fragmented, and if this is not reversed, it's a recipe for disaster" (UNDRR, 2019, p. 66).

Given the high degree of interdependence existing among the various dimensions of development and how vulnerable this process is to natural phenomena, as discussed throughout this study, it is clear that risk management is part of a complex dynamic. Because the State plays a leadership role in DRM, it may be simpler for it to categorize risks in a way that will allow it to delegate responsibility for dealing with them to different organizations, institutions or individuals. Risk management should not, however, be "departmentalized". Because risk management is such a complex process, it does not lend itself to traditional problem-solving models whereby a process is divided up and compartmentalized so that its symptoms can be dealt with one by one. Instead, it is imperative to move away from this kind of reductionist approach, which fails to address the systemic features of extreme events. This applies both to institutional agreements on risk governance and to community organization, research efforts and policymaking, where development planning can play a fundamental role.

Development planning has to embody a recognition of the complex interrelationships existing among the various interacting elements (processes, instruments, institutions and stakeholders) involved in the various issues that have to be addressed in order to further the development process. This is why a system-based approach is being advocated. This kind of approach can provide a way of understanding how these various elements interact and, on that basis, defining the way in which disaster risk should be managed on the ground (Máttar and Cuervo, 2017).

Using a system-based planning approach entails a recognition of particularly wide-ranging challenges in terms of both organization and operations. These are very practical kinds of challenges that must be overcome in order to manage complex interactions successfully. ECLAC (2018b) has classified these issues into the following categories:

(i) **Intertemporality.** Because public action takes place over different time horizons, mechanisms have to be devised for linking up short-, medium- and long-term planning horizons.

(ii) **Intersectorality.** Public action is deployed in the form of specialized institutional packages or blocs designed to address specific issues, areas or sectors. Planning processes must pull all these different elements together in order to arrive at a desired outcome from a global perspective.

(iii) **Interscalarity**. Public action is deployed at different levels of government with differing scopes and geographic coverage. As in the case of intersectorality, planning processes must ensure the coherence of the various types of actions being undertaken and provide for the management of existing interactions as well as linkages, tie-ins and agreements among all the various levels, from the global to the local.

(iv) **A multiplicity of actors**. Public action is taken in respect of a wide variety of stakeholders having differing—and, in many cases, divergent—interests and values. Planners have to identify these stakeholders and understand their interrelationships so that they can encourage participation and dialogue with a view to arriving at a shared objective (see box II.1).

Box II.1
Principle 10 of the Rio Declaration on Environment and Development

When dealing with a multiplicity of actors, Principle 10 of the Rio Declaration on Environment and Development (Rio de Janeiro, 1992) is an important factor in ensuring public participation in addressing environmental issues. The Rio Declaration was signed by 178 governments, including those of Latin America and the Caribbean, all of which agreed that the participation and inclusion of all affected groups in the population is the just way to deal with environmental challenges.

The propositions that underpin this principle are:

1. That an informed, educated public is better prepared to play a substantive role in environmental decision-making processes;
2. That meaningful participation on the part of an informed public is an effective and efficient means of integrating social and environmental concerns into decisions about economic policy and natural resource management;
3. That public access to judicial and administrative procedures—including redress and remedies for environmental damage—is a way of ensuring that decision-makers are accountable to the public.

If people have access to information about environmental matters and are able to express their views and to demand that the authorities and private agent are held accountable for their actions, then society as a whole will be in a position to prevent grave harm from being done to the environment and to put a stop to unsound environmental management practices. Hence the fundamental importance of ensuring that the right of access is fully upheld, as this will contribute to improved environmental governance.

Given the wide range of challenges facing the region, in recent years ECLAC has underlined the importance of concluding compacts for equality and a sustainable future. Such compacts will not be attainable, however, in the absence of more participatory and transparent democracies in which citizens are deeply engaged in making decisions about the type of society that they want to create. Principle 10 of the Rio Declaration paints a clear picture of the kind of transparency, environmental justice and access to information that can serve as a foundation for building a more robust democracy and rectifying global and local asymmetries.

ECLAC supported the negotiation of the first treaty to be concluded on the basis of Principle 10: the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean, adopted in Escazú, Costa Rica, on 4 March 2018. As the only treaty to be signed as a result of the United Nations Conference on Sustainable Development (Rio+20), this is a landmark agreement. In the words of the Executive Secretary of ECLAC, "The Regional Agreement is a ground-breaking legal instrument for environmental protection, but it is also a human rights treaty" (ECLAC, 2018c, p. 7).

The principles enshrined in the Escazú Agreement are closely related to information access and access to participation in disaster-related areas of endeavour, such as, in particular, the operation of emergency information systems that can be set into motion in response to wildfires, tsunamis, earthquakes or volcanic eruptions and the preparation of reconstruction plans following a disaster. It is important for the members of a community to be able to make their voices heard in the aftermath of a disaster and to be involved in the recovery effort.

- Environmental management instruments in which the right to information is recognized:
  - Pollutant release and transfer registers
  - Urban and national environmental quality monitoring systems
- Access to participation is provided by:
  - Environmental impact assessments
  - Strategic environmental assessments
  - Public hearings on permit applications
  - Multi-stakeholder councils
  - Legislative hearings
  - Preventive and environmental clean-up plans
  - Emissions and quality standards
  - Land use plans

Source: Prepared by the authors.

As is made clear in the Sendai Framework (United Nations, 2015b), there are also challenges to be met in the area of disaster risk management (DRM) planning in relation to aspects such as the following:

- Leadership: States bear the prime responsibility for averting and reducing disaster risks, and one of the means by which they can do so is to cooperate with other stakeholders.

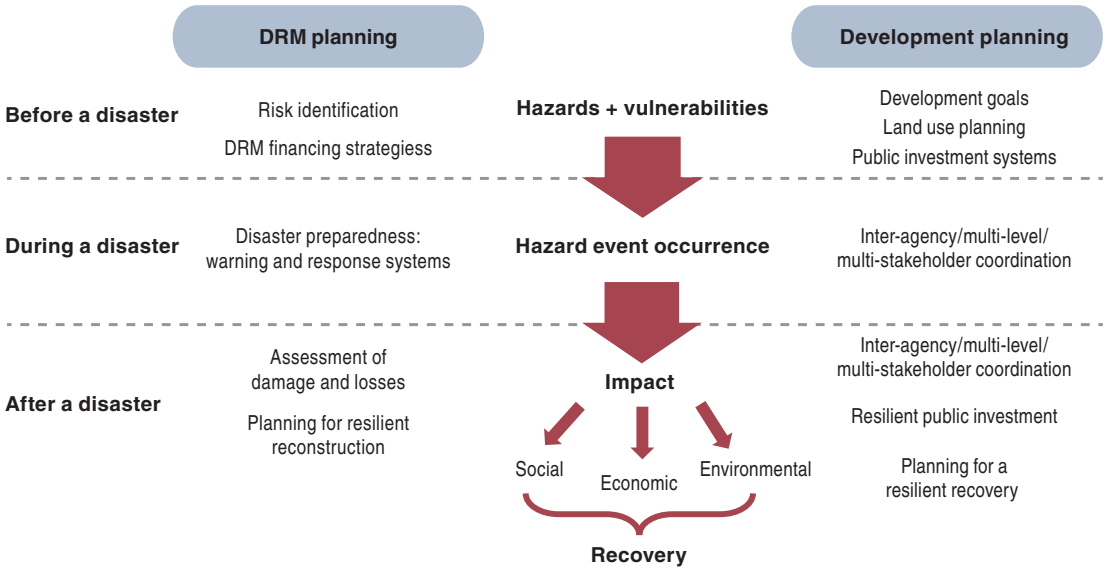
- Horizontal and vertical coordination: Responsibility for DRM is shared to varying degrees by the central government and its authorities with sectors and interested parties at the national level, depending on national circumstances. The active participation of all executive and legislative institutions of the State at the national and local levels is also important, as is the presence of a coherent set of disaster risk reduction (DRR) and sustainable development policies, plans, practices and mechanisms in the various sectors concerned. In addition, local authorities and communities have to be empowered through the provision of suitable resources, incentives and decision-making responsibilities.
- Multi-stakeholder coordination: DRM requires the concerted efforts of all actors in society.

B. Disaster risk management planning

As has been discussed, disasters can result in substantial setbacks in economic development and social well-being. The ultimate objective of an integrated DRM strategy is to keep the economic and social impacts of a disaster to a minimum by reducing communities' vulnerability and building their coping capacity. The DRM planning process must therefore be grounded in an understanding of the hazards, degrees of exposure and vulnerabilities existing in a given area and especially in those areas that are subject to the greatest risks. The incorporation of DRM into the planning process is therefore of crucial importance in ensuring the resilience of development policies.

DRM is a multisectoral activity and, as such, must be part of the coordination within the national planning process of the various parties involved. It rests on five pillars: (i) risk identification; (ii) risk reduction; (iii) preparedness; (iv) financial protection; and (v) resilient recovery. These pillars are closely interrelated and need to be set within a conducive institutional, political, regulatory and financial environment that permits the allocation of the necessary resources and the appropriate definition of roles and responsibilities (ECLAC, 2019). Since 2015, the disaster assessments conducted by ECLAC include a section on recommendations for resilient reconstruction that are classified on the basis of those five pillars.

Diagram II.1
Disaster risk management planning



Source: Prepared by the authors.

1. Planning for risk identification: hazards and vulnerabilities

Planners should map the natural hazards that exist and identify potentially exposed infrastructure (e.g. schools, clinics, roadways and the water supply, power and telecommunications systems) as basic inputs for the development of a risk management strategy (ECLAC, 2019). It is also very important to profile communities whose economic, demographic, environmental, institutional and/or social characteristics may put them at risk before, during and after a disaster.

By mapping out potential hazards, planners can develop a zoning system that will serve as a useful input for the design of land management and land use plans and the formulation of building codes. These maps can also provide guidance for future construction projects. During this process, it is also recommended that public institutions draw up geographically indexed risk profiles of their infrastructure that show which facilities are located in at-risk areas (ECLAC, 2019). The countries of Latin America and the Caribbean have made a good deal of headway in terms of one aspect of this pillar: the analysis of the hazards to which they are exposed. Each country has detailed maps of the various hazards. There is still a great deal of room for improvement in the valuation of structures in hazardous zones, however.

In this area of planning, some of the improvements that need to be made in local and national statistics are the following:

- Housing and non-residential infrastructure registers (schools, hospitals and businesses).
- Essential infrastructure registers (highways, airports, seaports, power plants and water treatment plants).
- The georeferencing of those registers and surveys. This kind of information is becoming increasingly important for DRM. The great majority of the countries in the region have made progress in this area, with the advances in georeferencing having been made by Brazil and Mexico being particularly notable.
- Improvements in two types of economic statistics that are essential for disaster assessments: regional GDP and quarterly breakdowns of national accounts. The statistical offices of Brazil, Chile and Mexico have made outstanding progress in this respect.

The transparency of this process is of the utmost importance, and decisions having environmental implications should made on a participatory, open and inclusive basis. Two of the tools available for identifying countries' disaster-related vulnerabilities are the Index of Governance and Public Policy in Disaster Risk Management (iGOPP) and the Index for Risk Management (InfoRM) (see box II.2 below). These types of indices can serve as sources of comparable, transparent information because their computational methodologies are also made public.

Box II.2
Risk assessment indices: the Index of Governance and Public Policy in Disaster Risk Management (iGOPP) and the Index for Risk Management (InfoRM)

Index of Governance and Public Policy in Disaster Risk Management (iGOPP)

The iGOPP was designed by the Inter-American Development Bank (IDB) for use in gauging the probability that a series of legal, institutional and budgetary conditions deemed essential for the effective implementation of disaster risk management (DRM) are in place in a given country. It is impossible to plan for something unless it can first be understood and then measured in some way. Therefore, if DRM governance can be understood, then decisions can be made that will make DRM systems in the region a reality (Lacambra and others, 2015). An organized, systematic analysis of the conditions for governance can be extremely useful for the design of regulatory and institutional programmes and projects to support DRM processes as a development strategy.

iGOPP reflects an awareness of the link between disaster risk and development. It therefore registers not only the existence of explicit regulations governing the public management of disaster risk but also the existence of regulations that are essential for risk governance in such areas as development, decentralization, land use planning, public investment and monitoring.

Evaluations based on this index have been carried out in a number of countries in the region: Argentina, Chile, Colombia, Costa Rica, the Dominican Republic, Guatemala, Haiti, Jamaica, Mexico, Panama, Peru, the Plurinational State of Bolivia and Uruguay. Findings concerning the conditions for risk governance based on the application of iGOPP point to some progress in most of the countries but also indicate that they are still at a very early stage in the process, thereby making it clear that there is a need to strengthen and consolidate these conditions for governance in order to put in place effective risk management systems in the region.

Index for Risk Management (InfoRM)

This index was developed jointly by the Inter-Agency Standing Committee (IASC) Task Team on Preparedness and Resilience and the European Commission as a tool for measuring the risk of humanitarian crises and disasters and for determining how the conditions that trigger them influence sustainable development processes.

InfoRM can be employed to support decision-making in the areas of crisis and disaster prevention, preparedness and response and in regard to strategies for building resilience. The index can also be used, for example, to set priorities for risk management, preparedness and resilience-building, to support decisions on resource allocation and to track risk trends over time.

The InfoRM methodology and procedures can be used to construct detailed risk models at national and regional scales that can then serve as inputs for decision-making about strategies and programming for emergency preparedness. The models are also useful in providing a common set of empirical data to support multi-stakeholder coordination.

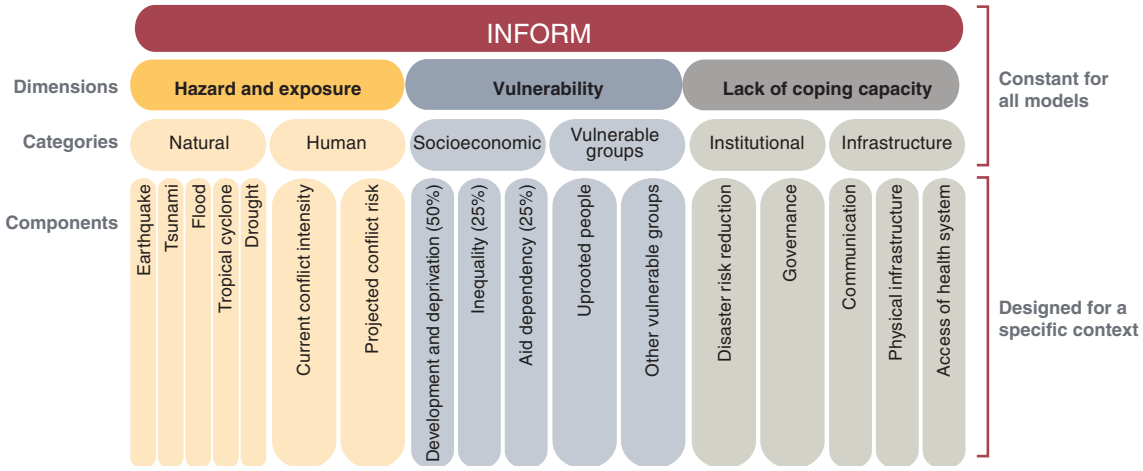
These kinds of regional and national models:

(i) Are the responsibility of local actors and are used in conjunction with local analysis and planning functions;

(ii) Can be adapted to local risk profiles and data environments;

(iii) Have a higher geographic resolution (subnational scales).

This open-source tool includes a subnational model that offers a detailed picture of existing risks and their components that can be applied on a comparable basis throughout a given area of a country or region, enabling the relevant authorities to analyse and visualize the risks that have been identified. This tool has so far been used to develop models for Colombia, Guatemala and Honduras, but government authorities, academics and non-governmental organizations can adapt it to the specificities of any given geographical area.



Source: Inter-Agency Standing Committee (IASC)/European Commission (EC), "InfoRM: Index for Risk Management", 2020 [online] https://drmkc.jrc.ec.europa.eu/inform-index.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of S. Lacambra and others, "Index of Governance and Public Policy in Disaster Risk Management (iGOPP)", *Technical Note*, No. 720, Washington, D.C., Inter-American Development Bank (IDB), 2015, and Inter-Agency Standing Committee (IASC)/European Commission (EC), "InfoRM: Index for Risk Management", 2020 [online] https://drmkc.jrc.ec.europa.eu/inform-index.

2. Planning for risk reduction

The second pillar of DRM is provided by risk reduction measures and their inclusion in the governance framework, which may require the amendment or introduction of national laws, ordinances and other long-term planning instruments (ECLAC, 2019). In most cases, the reason why infrastructure is damaged by a natural hazard is that it was not constructed properly or has been placed in an unsuitable (high-risk) location. Risk management also entails the use of investment policies and programmes that take account of vulnerabilities and include tools for reducing the exposure of a community or asset to a given threat (ECLAC, 2019). Planning, when employed as a DRM tool, can therefore help to mitigate vulnerabilities through the use of land management instruments, building codes and regulations, and the management of public investment:

- Spatial planning: Disaster risks should be taken into consideration when development master plans are being prepared or revised and updated. The focus should be on the different risk factors and the incorporation of multisectoral aspects such as water and sewerage systems management, environmental management, infrastructure development, flood mitigation, zoning and land use (ECLAC, 2019).
- Modification and enforcement of building codes: Another significant component of this pillar is the introduction of mandatory building codes and their enforcement in all areas. Building codes should incorporate the concept of essential infrastructure (i.e. assets that are critical for the operation of society and the economy). Essential infrastructure, particularly that related to food storage and the supply chain, health, education, water, energy and telecommunications, must be properly designed and constructed to withstand the most common hazards (ECLAC, 2019). Chile, Costa Rica and Mexico are examples of countries that strictly enforce their building codes and that have updated those codes after each major earthquake.
- Management of public investment: It is highly advisable for any new public investment in infrastructure to be based on a country's development plan and for it to incorporate a multi-hazard assessment component that can contribute to DRR efforts. Ministries responsible for project approval should include investment and infrastructure protection measures throughout the project, starting with the feasibility and design phases. Public and private investments in structural and non-structural measures for disaster prevention and DRR are needed to increase the economic, social, health and cultural resilience of people, communities, countries and their assets along with the resilience of the environment itself. These factors can drive innovation, growth and job creation.

Costa Rica provides a good illustration of how a national public health investment system can set the standard for DRR. The process of incorporating a DRM component into the National System for Public Investment (SNIP) was begun in 2007 in line with the Hyogo Framework for Action and with the support of the Coordination Centre for the Prevention of Natural Disasters in Central America and the Dominican Republic (CEPREDENAC). The first stage of this process was the incorporation of DRR considerations into project design and evaluation procedures in accordance with the country's public investment policy (Fallas, 2010). In 2009, an executive decree was issued to align the regulatory framework of SNIP, and the first public investment project identification, design and evaluation manual was issued the following year. This manual includes a multi-hazard DRR module for application in public investment project evaluations (MIDEPLAN, 2010). This, in effect, made the inclusion of a forward-looking DRR component in public investment projects mandatory.

3. Planning for disaster preparedness

The third pillar of DRM—preparedness—should figure as part of any national development plan. The concept of preparedness refers to the knowledge and skills developed by a government, the private sector and communities that allow them to anticipate, respond to and recover from a disaster. It encompasses not only everything that is done to prepare for disasters before they happen, but also the actions taken to mount an effective response that will pave the way for an organized transition from response to recovery. The extent and quality of preparedness are closely correlated with the prior preparation of community-based risk analyses and the deployment of efficient early warning systems. In order for all of this to be possible, institutional channels of communication must be established between public bodies and the community (ECLAC, 2019).

The swift activation of warning systems will give people enough time to prepare and to take steps to protect their homes and businesses and will give the government enough time to organize appropriate evacuation procedures, thereby reducing the number of deaths and injuries. New technologies for hazard identification and communication can make a valuable contribution, as can efforts to educate the population and raise awareness. Local evacuation plans that clearly mark out evacuation routes and the locations of shelters must be prepared. It is also important to set national standards for the establishment and operation of shelters in line with international best practices (ECLAC, 2019).

4. Planning of financial strategies for coping with disasters

The fourth pillar is financial protection, as disasters have an impact on a number of different macroeconomic variables. In fiscal terms, the most common impacts are the tightening of financial constraints, the weakening of fiscal balances, the diversion of funds from development programmes and, possibly, an increase in borrowing to deal with the event or to finance reconstruction. Resilient planning should include a financial strategy for protecting public-sector assets and for creating incentives for the private sector to protect its own assets. This kind of protection relies on ex ante instruments for financing DRR. A proper fiscal strategy for ensuring financial protection includes various instruments, such as insurance, loans and the use of national funds (ECLAC, 2019). Such a strategy should also include an efficient procedure for coordinating international cooperation efforts. In recent years, two countries of the region have taken steps to protect their fiscal accounts in the event of a disaster. In 2018, the Ministry of Public Finance of Guatemala, with the support of the World Bank, launched a financial strategy for coping with disaster risk that provides for the use of various financial instruments to deal with emergencies triggered by natural disasters. These instruments include budget allocations for DRM, rebudgets, emergency funds, insurance and reinsurance policies, catastrophe bonds, standby credits, post-disaster credits and grants (Ministry of Public Finance, 2018). In view of the complexity of the rebudgeting process, Jamaica has recently finished designing its Policy on National Disaster Risk Financing, which dovetails with its Vision 2030 Jamaica: National Development Plan. While the country already had its National Disaster Fund, as part of this new proactive approach it is designating its Contingencies Fund (which the Constitution states is to provide for any type of unforeseen expenditure) as the National Catastrophic Disaster Reserve Fund. These financial instruments are sufficient to deal with a minor disaster or one of intermediate severity, but there would be a financial shortfall for resilient reconstruction work in the event of a major disaster. The Government of Jamaica has therefore requested assistance from the World Bank in developing catastrophe bonds to bolster its financial recovery capacity.

5. Planning for a resilient recovery

As noted earlier, resilience can be defined as the "capacity of a system, community or society potentially exposed to hazards to adapt by resisting or changing in order to reach and maintain an acceptable level of functioning and structure" (United Nations, 2005, p. 9). While disasters clearly have harmful effects on society and the economy, they also are an opportunity for changing policies and practices in ways that will increase the affected areas' ability to recover and for incorporating DRM into future development projects.

There are two stages in any recovery process. The first involves attending to the affected population, getting the existing infrastructure back into operation and normalizing production activities. The second involves upgrading strategic infrastructure in accordance with a local development approach that takes into account the components of the other pillars mentioned earlier. If a decision is made to rebuild, this effort should entail: (i) a master plan setting out the criteria for the hazard-resistant reconstruction and siting of the structures in question, and (ii) economic viability criteria and a social cost-benefit assessment of the area affected by the event (ECLAC, 2019).

Building resilient infrastructure that plays a key role in development and reducing the risks that are inherent in any new investment are clearly an advisable course of action, but this is not enough to manage the threat that disasters pose to a country's or area's development prospects. The reconstruction process must take into account not only the hazard that triggered the disaster but also any other hazards that the country or community is exposed to. This is necessary in order to avoid reproducing risk conditions and ensure the availability of the financial resources required to bring about change. In addition, disaster resilience must be properly integrated with resilience to other phenomena, such as climate change (ECLAC, 2019).

Resilient recovery capacity is the fifth and final pillar of DRM. Achieving this kind of capacity entails changing the way that the development planning process is viewed and incorporating the five pillars of DRM into national planning instruments. Within the context of DRM, efforts to build the resilience and general well-being of the population should reflect a rights-based approach. This means that recovery efforts should not focus solely on infrastructure but should also ensure that people have access to basic services and livelihoods, both of which are of pivotal importance for development (ECLAC, 2019).

Building resilience is a necessary part of risk reduction and disaster prevention. It calls for strategic planning to avert or minimize new risks and to reduce existing ones, to develop the capacities required to swiftly reactivate systems following a disruption and to have the ability to adapt and change in the aftermath of a disaster.

The incorporation of DRM objectives and strategies into national development policies and plans is of crucial importance in DRR and is an inherent part of a sustainable development process. When a country integrates policy instruments for DRM with national policy frameworks, it facilitates the allocation of human, technical and financial resources for achieving these goals. Recovery capacity then automatically becomes a sine qua non for sustainable development (ECLAC, 2019).

C. The COVID-19 pandemic

CRED classifies epidemics as a biological natural disaster. The severity and extent of the COVID-19 pandemic is without precedent in the last 100 years. In the case of the most common types of phenomena to beset the region, a hazard may materialize over the course of a few minutes (earthquakes), days (storms and floods) or weeks (forest fires), but a biological disaster of this type may last for months or even years. This fact, in combination with its geographic scope, gives rise to impacts of enormous proportions in terms of the affected population and the economic damage and losses that are caused.

From the standpoint of public policy and DRM, this pandemic poses a number of formidable challenges for the countries of the region. The first challenge is to deal with the health crisis, but later, once the crisis has passed, all the sectors hurt by the containment measures will face the challenge of making a successful recovery. Along with dealing with the emergency, the State must undertake planning activities that will enable it to sustain and, later, boost supply and demand, especially in the sectors hit the hardest by the pandemic. This will require public resources and capacities. It will also require policy tools tailored to the production capacities of each individual country and designed to preserve its installed capacity (ECLAC, 2020b). This entire process will give rise to lessons that planners will be able to draw upon in mitigating the risks of future events of this type. Five key elements of the planning and DRM challenges posed by COVID-19 are discussed below.

1. Risk identification

In the face of this type of hazard, the countries of the region have had to deal with uncertain scenarios and to take decisions without having sufficient information. The outbreak of influenza A (H1N1) in Canada, Mexico and the United States notwithstanding, the region had never witnessed such a pervasive event of this type before the pandemic hit. It has been making a colossal effort to reduce the level of uncertainty by looking to science and to the experiences of the countries where the epidemic began earlier as a basis for defining different strategies to address this hazard. Given the unforeseen nature of this event, from a planning perspective it is of critical importance to identify various types of vulnerabilities, such as shortages of the infrastructure and equipment that the health sector needs to cope with the crisis. This type of vulnerability has been exacerbated by the spending cuts made by some countries in that sector as part of the drive to downsize government in the past few decades. Another experience from which lessons should be drawn for the future has to do with the quantification of data and georeferencing as applied to groups that are at risk of health problems and the identification of groups, sectors and individuals who are especially vulnerable to the economic and social effects of a disaster. Another important issue in this connection has to do with the development of national and local digitization strategies and mechanisms for increasing institutional interoperability in order to facilitate the accurate and timely identification of the most vulnerable groups in the population and the potential recipients of assistance measures and aid packages.

2. Coordination

A disaster of this magnitude can hardly be addressed by any single country on its own. Efficient international coordination is required in a wide variety of areas, ranging from the exchange of scientific knowledge and information to the use of coordinated containment, logistical, technical and financial measures and to the introduction of joint health, social and economic schemes. In order to overcome this worldwide disaster, global action will have to be taken within a framework of international cooperation and solidarity. This type of coordination will necessarily involve international organizations, developed countries and countries of the region.

At the individual government level, inter-agency coordination may be a key factor in the mitigation of vulnerability and in a country's coping capacity. The scope of this health crisis and of its multidimensional effects have made it quite clear that an event of this type cannot be addressed by a single sector (e.g. the health sector) but instead calls for an integrated and coordinated response by the authorities in charge of the economy (financial relief and recovery measures), social institutions (education, social safety nets, gender-related matters) and agencies responsible for public safety and security (responses to domestic violence, quarantine enforcement, public order and logistical support). A nation's development planning institutions can play an important role as a liaison among the various agencies making up its institutional structure.

Local governments are being called upon to deal directly with many of the consequences of this disaster. Unless they act in coordination with the national government (i.e. on a multi-level or interscalar basis), their coping capacity may be diminished and the attendant vulnerabilities may be amplified. The coordination of national policies must therefore take local government action into account, since, although local governments are the ones that are in direct contact with the affected population, they sometimes lack the technical or economic capacity to provide the required services. Owing to a lack of coordination, as reflected in the frequent cases in which local authorities and central government authorities are implementing conflicting emergency measures, the health crisis is taking on the characteristics of a political crisis in some instances (ECLAC, 2020a).

Coordination with other actors is just as important as coordination within the government structure. When a disaster is of such a scope that it outstrips a government's ability to cope with it on its own, public-sector action must be coordinated with the efforts of the private sector and civil society. In such cases, it is important to delineate areas of action for all sectors (e.g., health care) and for each sector in particular (for the private sector: logistics, mainly for the supply of goods and services, economic activity and production; for academia: empirical research; and for civil society: information management, compliance with emergency measures, humanitarian action and volunteer efforts).

3. Government leadership

As clearly follows from the existence of this need for multi-level or interscalar coordination, the State has a key role to play in managing the crisis and in supporting a recovery. In addition to the technical, financial and managerial capacities that it can supply, it must also provide leadership both in intra-State dealings and in inter-stakeholder relations. This is true not only with regard to decision-making; leadership is also needed when those decisions are being communicated to the public and when the government is interacting with the public and must earn its trust. "Beyond any predictive model, government action is being carried out on a trial and error basis" (ECLAC, 2020a, p. 1). If leadership is lacking, if a government lacks credibility and transparency and if it is mistrusted at a time when the poorest sectors of the population are without protection and are having serious difficulties in gaining access to the most essential goods, conditions may be ripe for social unrest (ECLAC, 2020a).

4. Open government

The principles and tenets of open government play a crucial role in cultivating the kind of trust that will enable the State to strengthen its leadership and thus address the crisis more successfully. Open government is founded upon transparency, access to information, accountability and opportunities for public participation and collaboration. Scope has to be created for the emergence of synergies between the public and government authorities by opening up channels for participation and collaboration in pursuit of a common goal. During the COVID-19 crisis, the extent to which these pillars of open government have been undermined or championed has directly influenced how effective public action has been in the short run and will surely do so as well in the medium and long terms.

At the present time, for example, the transmission rate of the virus is a variable that largely depends on the measures taken by governments and the degree of public compliance with those measures, which, in turn, hinges on public trust in government and other institutions, among other factors. While this crisis is far from over and no one yet knows how it will end, there is a broad consensus that governments' management of the crisis should not undermine their countries' democratic systems and this, in turn, requires effective interaction with the citizenry. One of the most controversial issues in this regard has been transparency and access to information. On the one hand, epidemiological data are an essential basis for decision-making and must therefore be shared with scientists, yet, on the other, there is a risk that personal information may be made available that could then be used for other ends. Making comparable data available in reusable formats is therefore vital, but those data must be properly anonymized in order to protect people's identities.

It is essential for all stakeholders to work together to devise response measures and tools that will maintain the legitimacy and credibility of institutions in times of crisis. What is needed, therefore, is a new kind of State—one that does not only work for its citizens but that also works with its citizens and on their behalf—to engender greater participation and legitimate channels for representation that will reinforce government leadership.

5. Planning for resilience

Once the emergency is over, there will be an even greater challenge to face: making a resilient recovery. Gauging the extent of the drop in economic activity is the first step in determining the extent of the effort that will be needed to return to normal. But that "return" will not and should not be a return to the pre-pandemic situation. On the medium-term horizon, ECLAC looks forward to structural changes in the way production activity is organized, which will also have certain (in some cases irreversible) effects on the structure of labour, employment and well-being (ECLAC, 2020b).

The impact of the COVID-19 crisis in various aspects of the development process will translate into major setbacks along the path to the achievement of the Sustainable Development Goals. Some preliminary studies have found evidence of reversals in progress towards over 40 targets of at least 14 of the Goals in such areas as poverty reduction, sustainable food production, the reduction of deaths caused

by communicable diseases, increases in the coverage and quality of education, the reduction of gender violence, increases in investment in basic service infrastructure, economic growth, full employment, the development of small and medium-sized enterprises (SMEs), reductions in inequality, a decrease in the size of the population affected by disasters, increased participation by developing countries in international governance institutions and the increased mobilization of resources for official development assistance.

Even before this health crisis, it was evident that difficulties were being encountered in making sufficient progress towards the Sustainable Development Goals, and ECLAC was therefore recommending that an assessment be undertaken to determine whether policies for the implementation of the 2030 Agenda were helping to reverse negative trends and strengthen positive ones. Now, given the current state of affairs, there is an even greater need to adopt measures, as a matter of urgency, to stop the existing lags in progress towards the Goals from growing greater and to prevent ground from being lost in those areas where the region was making good progress (ECLAC, 2020c).

In view of this turn of events, development strategies should place emphasis on resilience, and their priorities should be revisited in order to incorporate the potential effects and new challenges that this crisis signifies for development planning processes, especially in areas relating to the role of the State such as health, social protection, economic growth and the promotion of values such as solidarity. By the same token, this experience makes it necessary to rethink and update existing DRM systems and strategies to incorporate lessons learned during this crisis in relation to risk identification, coordination and integrated disaster management.

The changes in social and economic dynamics wrought by the COVID-19 biological disaster will open the way for a thorough-going transformation. Long before the outbreak of this pandemic, ECLAC had seen the need for a paradigm shift because existing development patterns were only perpetuating long-standing inequalities. This has been made even more apparent by the current crisis.[6] The response to this crisis needs to be coordinated by the countries through their institutional structures, by legitimate actors and by a society that values solidarity and that has robust leaders capable of collaborative action. The United Nations Inter-Agency Task Force on Social and Solidarity Economy, which is composed of representatives of 17 United Nations agencies plus the Organization for Economic Cooperation and Development (OECD) and 13 observers representing international social and solidarity economy networks and research institutes, is on the leading edge of the effort to organize the response of this ecosystem of social and economic solidarity.

In the face of this crisis, various types of responses based on social and economic solidarity are emerging with even greater forcefulness. These responses are centred around the three Cs: collaboration, cooperation and confidence. The COVID-19 pandemic is putting to the test the world's ability to put these three Cs into practice. Public policies and planning and budgetary allocation procedures must be coordinated and rethought if comprehensive responses are to be mounted to the difficult challenges facing the international community.

D. Planning tools for disaster risk reduction in Latin America and the Caribbean

The goals set forth in both the 2030 Agenda (targets 1.5, 11.b and 13.1) and the Sendai Framework (global target E) include progress by countries in developing DRR strategies at both the national and subnational levels and the incorporation of disaster risk responses into national development strategies. National planning authorities, along with representatives of all key government actors and a range of societal actors, should develop DRR strategies that involve the State as a whole and that will enable the countries to successfully manage the widespread impacts of hazards and vulnerabilities in their territories.

[6] See ECLAC (2016).

National and subnational DRR plans or strategies are essential for the implementation and monitoring of high-priority risks because they provide a means of establishing implementation benchmarks, assigning duties and responsibilities to various governmental and non-governmental actors and identifying the necessary technical and financial resources. Since these strategies are a core element of disaster risk governance and effective policy implementation, they should be underpinned by a well-coordinated institutional architecture and supported by human and financial resources at all levels of society.

In some cases, risk reduction can be integrated into a national development plan or into sectoral risk management plans or strategies. In fact, this can be a way of integrating risk management and development planning. In situations where DRR awareness needs to be enhanced, targeted strategies can be a useful tool for sensitizing decision-makers to the need for concrete measures. In such cases, however, it is important for these strategies to provide for their integration with medium- and long-term development goals, including those relating to climate risk management.

In many national contexts, stand-alone DRR strategies or plans are needed because DRR objectives are not covered by the national development plan or sectoral policies or even by these countries' disaster risk management systems, many of which have traditionally focused on providing services and resources in response to emergencies rather than on preparedness for naturally occurring extreme events. This is usually the case in countries with less governance capacity, where DRR strategies and plans are making up for the lack of risk management components in development or sectoral policies.

Both the Sendai Framework and the 2030 Agenda (United Nations, 2015a and 2015b) call for integrated risk reduction strategies that are broader in scope than civil protection systems and that also include intersectoral components, such as urban risk management, land use planning, watershed management, financial buffers, regulations on public investment recovery capacity, preparedness and early warning systems. These kinds of programmes cannot be fully encompassed by any single sectoral strategy or plan.

Over the past two decades there has been a growing recognition of the fact that subnational DRR strategies or plans that supplement national policy frameworks are needed in order for a risk governance system to function properly. For the successful implementation of national DRR strategies, national priorities need to be flexible enough that they can be adapted to local conditions and needs. The existence of local strategies or plans makes it possible to adopt a much more harmonized multi-level (local, subnational and national) approach that will promote accountability by engaging the direct commitment of a wide range of actors whose participation is crucial in order to avert the creation of new risks, reduce risk-generating activities and make the voices of the main disaster-affected groups heard. The chances of DRR strategies being successfully downscaled to the local level will probably be determined by how decentralized a country is; a government's formal structure as a centralized or federal entity may or may not be a critical factor, depending on the situation in each country. Since risk is not delimited by any particular administrative or political division, cross-border and regional solutions need to have a place in DRR strategies. These kinds of solutions may focus on individual watersheds or ecosystems or may taken the form of agreements covering a number of local governments' districts.

The United Nations Office for Disaster Risk Reduction (UNDRR, 2019, p. 252) has proposed a number of key considerations in the alignment of DRR strategies with the Sendai Framework:

(i) Have different timescales, with targets and indicators being associated with different time frames;

(ii) Have aims focusing on preventing the creation of risk;

(iii) Have aims focusing on reducing existing risk;

(iv) Have aims focusing on strengthening economic social and environmental resilience;

(v) Address the recommendations of priority 1: Understanding disaster risk;

(vi) Address the recommendations of priority 2: Strengthening disaster risk governance to manage disaster risk;

(vii) Address the recommendations of priority 3: Investing in disaster risk reduction for resilience.

There are three ways to incorporate DRR into planning instruments: (i) including it in national development plans (or their equivalent) in the form of goals, targets or lines of action; (ii) designing national DRR strategies; or (iii) having local governments draw up DRR strategies.

The region's landscape is a varied one in this respect. As far as the incorporation of DRR into national development plans is concerned, 25 of the 30 countries have national planning instruments that include DRR goals, targets or lines of action (see map II.1). The national development strategy of Antigua and Barbuda, for example, identifies DRM and resilience to climate change as a necessary condition for achieving the goals of improving the natural environment and sustaining historical and cultural assets (Ministry of Finance and Corporate Governance, 2015). One of the objectives of the strategy of the Bahamas is also to incorporate DRR into plans and policies for building resilience to hazards (National Development Plan Secretariat of the Bahamas, 2017).

Map II.1
Disaster risk reduction goals and targets in national development plans

Source: Prepared by the authors, on the basis of data from the Regional Observatory on Planning for Development in Latin America and the Caribbean [online] https://observatorioplanificacion.cepal.org/en.

The development plans of the Central American countries bear similarities to those just mentioned. For example, the national development plan of Guatemala calls for DRR measures in order to improve the adaptive capacity and resilience of both the population and its ecosystems (CONADUR, 2014) and Panama's planning instrument provides for the establishment of adaptive and DRR strategies and protocols at the national and local levels (Government of Panama, 2019). The planning instruments of the South American countries also underscore the importance of DRR in the achievement of development goals. For example,

in Brazil's plan, DRM is a specific goal (Ministry of Planning, Development and Management, 2015) and, in Colombia, the education of the community about disaster risks and climate change with a view to the improvement of decision-making is one of the aims of the Sustainability Pact, which is intended to strike a balance between the development of the production sector and the conservation of the environment in ways that will foster the emergence of new economies and safeguard natural resources for the enjoyment of future generations (National Planning Department, 2019).[7]

There are other countries that do not include specific DRR goals in their planning instruments but that do identify DRM as a factor to be taken into consideration in order to achieve their national objectives. One case in point is Costa Rica, which classifies risk management as one of the main factors that is to guide the formulation of the plan in relation, in particular, to public investment projects concerning infrastructure, production, housing and environmental degradation (MIDEPLAN, 2018). The situation is similar in Honduras, whose plan provides for public investment projects aimed at preventing and mitigating natural disaster risk (General Government Coordination Secretariat, n/d). Finally, there is the case of Uruguay, whose white paper entitled *Aportes para una Estrategia de Desarrollo 2050* (Inputs for a 2050 development strategy) discusses how the loss of biodiversity may heighten the adverse effects of natural disasters in areas that have been put at risk by the environmental crisis and climate change (Office of Planning and the Budget, 2019).

According to a study carried out by the Regional Observatory on Planning for Development in Latin America and the Caribbean, 14 of the 33 countries in the region have national DDR plans or strategies (see table II.1). What is more, all the strategies introduced in the last three years include targets set out in the Sendai Framework, acknowledge the importance of transitioning from disaster management to integrated disaster risk management and underline the powerful role of inter-agency coordination in DRR.

Table II.1
Latin America and the Caribbean (14 countries): national disaster risk management plans or strategies

País	Plan or strategy
Argentina	Plan Nacional para la Reducción del Riesgo de Desastres 2018-2023 (National Disaster Risk Reduction Plan 2018–2023)
Bolivia (Plurinational State of)	Programa Nacional de Gestión de Riesgos (National Risk Management Programme)
Chile	Política Nacional para disaster risk management (National Policy on Disaster Risk Management)
Colombia	Plan Nacional de Gestión del Riesgo de Desastres: una estrategia de desarrollo 2015-2025 (National Disaster Risk Management Plan: a development strategy for 2015–2025)
Costa Rica	Plan Nacional de Gestión del Riesgo 2016-2020 (National Risk Management Plan 2016–2020)
Dominican Republic	Plan Nacional de Gestión Integral del Riesgo de Desastres (National Integral Disaster Risk Management Plan)
Ecuador	Plan Nacional de Respuesta ante Desastres (National Disaster Response Plan)
El Salvador	Plan Nacional de Protección Civil, Prevención y Mitigación de Desastres (National Civil Protection and Disaster Prevention and Mitigation Plan)
Guatemala	Plan Nacional de Gestión de Riesgo de Desastres Guatemala 2018-2022 (National Disaster Risk Plan of Guatemala 2018–2022)
Honduras	Plan Nacional de Gestión Integral de Riesgos - PNGIRH - Periodo 2014-2019 (National Integrated Risk Management Plan 2014–2019)
Paraguay	Plan Nacional de Implementación del Marco de Sendai 2018-2022 (National Plan for the Implementation of the Sendai Framework 2018–2022)
Peru	Plan Nacional de Gestión del Riesgo de Desastres: PLANAGERD 2014-2021 (National Disaster Risk Management Plan 2014–2021)
Saint Kitts and Nevis	St. Kitts and Nevis National Disaster Plan
Saint Lucia	National Emergency Plans

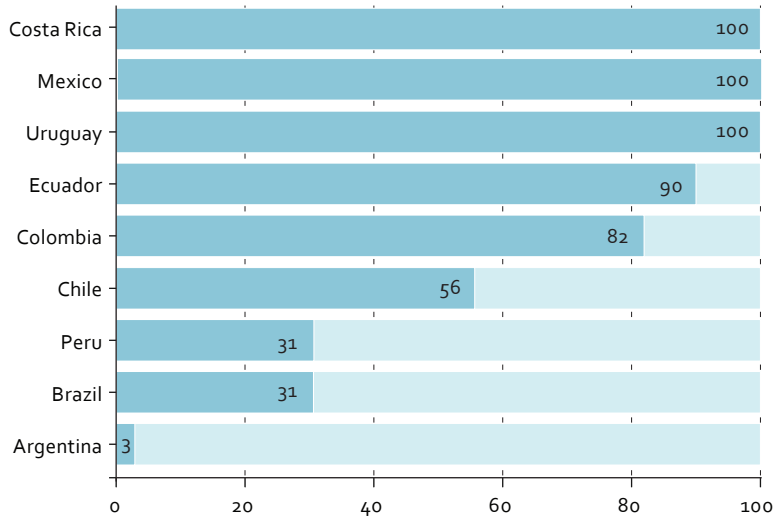
Source: Prepared by the authors, on the basis of data from the Regional Observatory on Planning for Development in Latin America and the Caribbean [online] https://observatorioplanificacion.cepal.org/en.

[7] See [online] https://www.dnp.gov.co/DNPN/Plan-Nacional-de-Desarrollo/Paginas/Pactos-Transversales/Pacto-por-la-sostenibilidad/Sostenibilidad.aspx.

Two studies in particular—Bello and others (2017) and Weekes and Bello (2019)—trace the inroads made by DRM in the development policies of Caribbean countries (Bahamas, Barbados, Belize, Dominican Republic, Guyana, Haiti, Jamaica, Saint Lucia, Suriname, and Trinidad and Tobago).

One of the indicators for three of the Sustainable Development Goals (Goals 1, 11 and 13) is the percentage of local governments that have DRR strategies (see figure II.1). According to information provided by national platforms for tracking progress towards the Goals and the United Nations Statistical Division (UNSTAT), only nine countries in the region (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru and Uruguay) report on this indicator. Of these countries, Costa Rica reports that all of its municipal governments have DRR strategies. Mexico and Uruguay also report 100% compliance but at intermediate, rather than local, levels of government (states in the case of Mexico and departments in that of Uruguay). In Ecuador, Colombia and Chile, a large percentage of local governments have such strategies (90%, 82% and 56%, respectively).

Figure II.1
Latin America and the Caribbean (9 countries): local governments with disaster risk reduction strategies
(Percentages)



Source: Regional Observatory on Planning for Development in Latin America and the Caribbean, on the basis of data from United Nations, Global SDG Indicators Database, 2020 [online] https://unstats.un.org/sdgs/indicators/database.

There are a number of subregional DRM strategies in place in Latin America and the Caribbean, such as the Comprehensive Disaster Management (CDM) Strategy 2014–2024 of the English-speaking Caribbean, the Regional Plan for Disaster Risk Reduction (PRRD) 2019–2023 of the member States of the Central American Integration System (SICA) and the Andean Strategy for Disaster Risk Management of the Andean Community (see table II.2).

Having DRR strategies in place and incorporating DRR-related components into development planning instruments is an indicator of the progress that has been made and is essential to the creation of a conducive environment for the achievement of all the targets and objectives of the Sendai Framework by 2030. A recognition of the importance of having national and local DRR strategies is nothing new, as their importance was underscored during the implementation of the Hyogo Framework for Action, the predecessor of the Sendai Framework, although such strategies were not identified as a specific objective in that instrument. (For examples of cities that are implementing DRR plans, see box II.3.) When the period established for the implementation of the Hyogo Framework for Action came to an end in 2015, 94 of the 105 countries that submitted progress reports in 2013–2015 had legislative or regulatory DRM provisions in place, and 69 had national DRM strategies and plans. There was no official compilation of local DRR strategies at the time, since a systematic tracking system was not set up until 2015. However, most of the national DRR strategies and plans adopted under the Hyogo Framework for Action focused on disaster preparedness and the reduction of existing risks.

Table II.2
Latin America and the Caribbean: subregional disaster risk management plans

Subregion	Strategy	Description
The Caribbean	Comprehensive Disaster Management (CDM) Strategy 2014–2024	This strategy's four priority areas are: (a) Strengthen institutional integrated disaster management arrangements; (b) Increase knowledge management for comprehensive disaster management; (c) Enhance the integration of comprehensive disaster management at the sectoral level; (d) Strengthen and maintain community resilience.
Central America	Regional Plan for Disaster Risk Reduction (PRRD) 2019–2023	This plan, which is set within the framework of the Central American Policy on Comprehensive Disaster Risk Management, is designed to contribute to the integration of disaster reduction efforts forming part of the sustainable development process of the member States of the Central American Integration System (SICA) and to couple that integrated approach at the global level with the Sendai Framework and the Sustainable Development Goals.
South America	Andean Strategy for Disaster Risk Management	The aim of the strategy of the four member countries of the Andean Community (Colombia, Ecuador, Peru and the Plurinational State of Bolivia), which is aligned with the Sendai Framework, is to strengthen the member States' institutional capacity for furthering disaster risk management, reduction and prevention and to support the alignment of disaster risk information systems.

Source: Prepared by the authors, on the basis of data from the Regional Observatory on Planning for Development in Latin America and the Caribbean [online] https://observatorioplanificacion.cepal.org/en.

Box II.3
Planning for disaster risk reduction in the region's cities

Nearly 80% of the population of Latin America and the Caribbean are city dwellers, and it is therefore regarded as one of the most highly urbanized regions in the world (UN-Habitat, 2012). Deficient urban planning heightens cities' vulnerability to potential disasters. This situation and the fact that almost 80% of all the disasters that have hit the region have occurred in urban areas show how important it is for municipal governments to integrate disaster risk reduction (DRR) strategies into their planning processes, use them as tools for identifying and understanding the risks (including natural hazards) that they face and then take that information into account when adopting decisions. The guide entitled *How to Make Cities More Resilient: a Handbook for Local Government Leaders* (UNDRR, 2012) outlines 10 steps for making cities resilient to disasters:

1. Organize the city for disaster resilience. Establish an organizational structure and endow it with solid leadership and sound coordination procedures and then assign duties and responsibilities in a clear-cut manner. Give DRR an important place in the city's strategic project or plan.
2. Identify, understand and use current and future risk scenarios. Maintain up-to-date data on hazards and vulnerabilities. Prepare risk assessments and base them on participatory processes. These assessments should then serve as the foundation for urban development efforts and long-term planning goals.
3. Strengthen the city's financial capacity for resilience. Draw up a financial plan based on an understanding and assessment of the major economic repercussions of disasters. Locate and develop financial mechanisms to back up resilience-building efforts.
4. Pursue resilient urban development and design. Urban planning and development processes must take the risks involved into account and should therefore be based on up-to-date risk assessments, with special emphasis on vulnerable population groups. Adopt and enforce realistic building codes and regulations in line with risk levels.
5. Safeguard natural buffers to enhance natural ecosystems' protective functions. Identify, protect and monitor critical natural ecosystems within and outside the city and promote their use for risk reduction purposes.
6. Strengthen institutional capacity for resilience. Gain an understanding of the nature of institutional risk reduction capacities (including those of governmental organizations, the private sector, academia, professional and trade organizations, and civil society) as this will contribute to the detection and elimination of existing gaps in resilience capacity.
7. Understand and strengthen society's resilience capacity. Identify and reinforce social connections and help to cultivate a culture of mutual aid through community and government initiatives and multimedia communication channels.
8. Increase the resilience of infrastructure. Develop a strategy for protecting, modernizing and conserving fundamental infrastructure. Develop risk-mitigation infrastructure where necessary.
9. Ensure that effective disaster preparedness and disaster response systems are in place. Formulate preparedness plans and update them regularly, link them up to early warning systems and bolster emergency and management capacities.
10. Expedite the recovery and build back better. Develop post-disaster recovery, rehabilitation and reconstruction strategies that are aligned with long-term plans and ensure that they will contribute to an improved urban environment.

Under the banner of the worldwide campaign entitled "Making cities sustainable and resilient: implementing the Sendai Framework for Disaster Risk Reduction 2015–2030 at the local level", some cities in the region have taken part in the formulation of DRR plans. One of these is the city of Santo Domingo Este in the Dominican Republic. Its Municipal Plan for Disaster Risk Reduction 2018–2025 is aligned with its National Development Strategy and is designed to help build a city that is hazard-resilient.[a] The outstanding feature of this plan is that it incorporates rapid risk estimation and self-assessment tools for gauging disaster resilience at the local level. These kinds of tools have been advocated by the United Nations Office for Disaster Risk Reduction (UNDRR) to help local governments fulfil their commitments under the Sendai Framework. In line with both the Sendai Framework and the National Integrated Risk Management Plan, it also takes a comprehensive approach to DRR that includes organizational considerations relating to the relevant institutions and the measures that should be adopted before, during and after a disaster.

Another example is the Vulnerability and Emergency Management Plan developed by Guatemala City, which provides for the participation of the entire municipal structure, civil society, government agencies and private institutions in mounting an effective, coordinated response in accordance with established protocols to mitigate the loss of life and material and environmental damage. This multi-stakeholder plan, like the plan of Santo Domingo Este, takes pre-disaster conditions into account and paves the way for a transition from disaster management to disaster risk management. This transition is based on risk identification, hazard prevention, immediate response capacity, and mitigation or reduction of the impact of a disaster, along with reconstruction or damage control in line with the integrated approach espoused by the 2030 Agenda for Sustainable Development and the Sendai Framework.

Source: Prepared by the authors, on the basis of United Nations Human Settlements Programme (UN-Habitat), *State of Latin American and Caribbean Cities 2012: Towards a New Urban Transition*, Nairobi, 2012; United Nations Office for Disaster Risk Reduction (UNDRR), *How to Make Cities More Resilient: a Handbook for Local Government Leaders*, Geneva, 2012.

[a] See [online] https://www.sismap.gob.do/Municipal/uploads/evidencias/636862774656125197-15-de-febrero-2019--Plan-Municipal-de-Gestion-de-Riesgo-ayuntamineto-santo-domingo-este.pdf.

One of the lessons learned during the implementation of the Hyogo Framework for Action had to do with the fact that, although the countries had designed very good DRR strategies, those strategies could not always be implemented because some countries lacked the necessary resources or political support and/or were unable to secure the participation of other key actors. Plans and strategies have to be practical for the country concerned rather than entirely aspirational. In order to be effective, they must engage the relevant stakeholders, be well resourced and backed up by the necessary capacities and commitment, and be coupled with a robust system for monitoring and follow-up (see chapter III).

III. Information systems, statistics and indicators for disaster risk management

A. Global frameworks of disaster-related indicators

The adoption of a common reporting mechanism for the 2030 Agenda for Sustainable Development and the Sendai Framework has prompted the international statistical community to step up its support for the development of statistics on disaster-related factors. A number of the targets established under Sustainable Development Goals 1 (No poverty), 11 (Sustainable cities and communities) and 13 (Climate action) deal with reducing vulnerability and exposure to disasters and building resilience to extreme events. As shown in diagram III.1, the 38 indicators established for tracking progress towards the 7 global targets of the Sendai Framework are, in the aggregate, mirrored in the 5 disaster-related indicators included in the global indicator framework established for tracking progress towards the Sustainable Development Goals. These latter indicators have been accorded priority by the Statistical Conference of the Americas, which has also added another complementary indicator for Sustainable Development Goal 13 to the set of regional priority indicators for follow-up to the Goals in Latin America and the Caribbean (C-13.1: Occurrence of extreme natural events and disasters, by type).

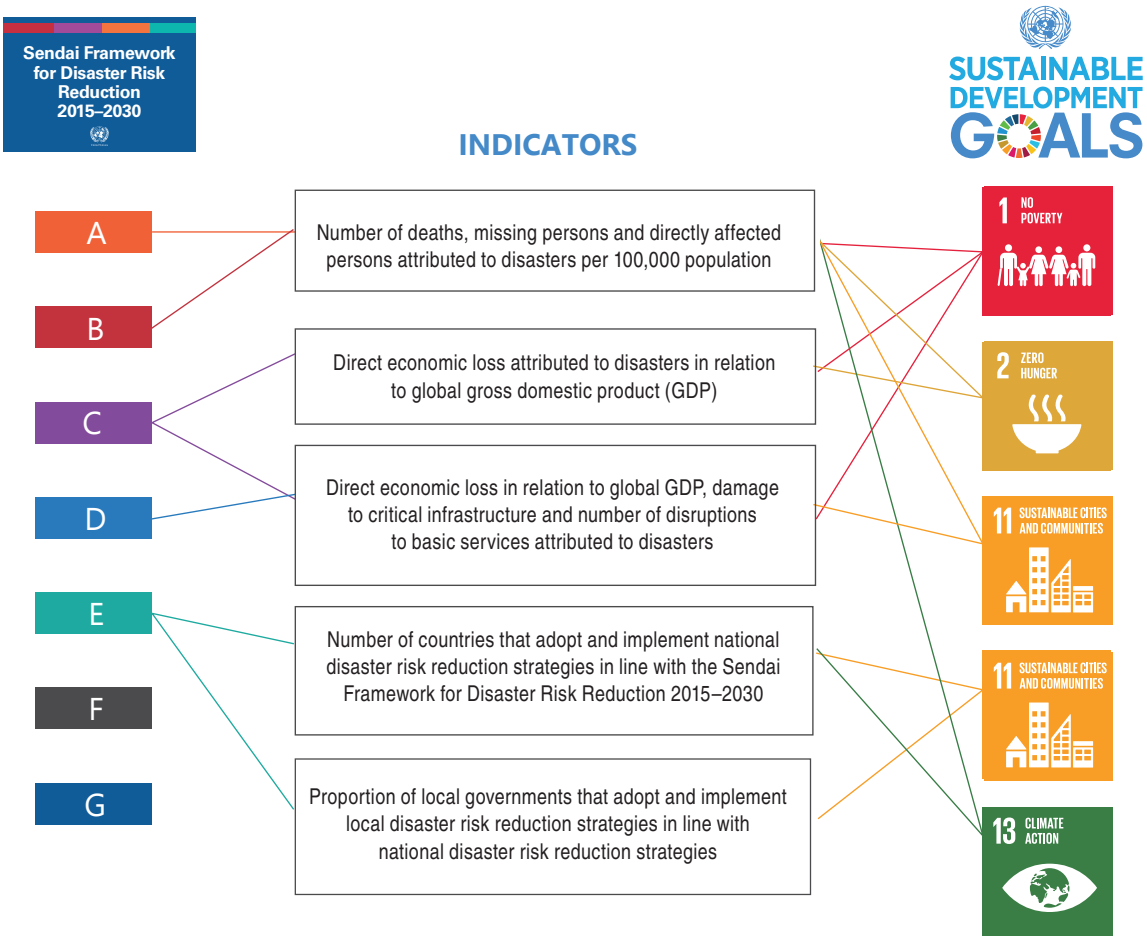
The following two indicators for global targets F and G of the Sendai Framework are not part of the global indicator framework for the Sustainable Development Goals:

F-1. Total official international support (official development assistance (ODA) plus other official flows) for national disaster risk reduction actions;

G-1. Number of countries that have multi-hazard early warning systems.

With the introduction of this global indicator framework, governments are paying more attention to disaster-related statistics than before. As this is a relatively new statistical category for most countries, there is a great demand for technical assistance and expertise relating to good practices and tools at the international level.

Diagram III.1
Correspondence between the indicators for the Sendai Framework and the indicators for the 2030 Agenda for Sustainable Development

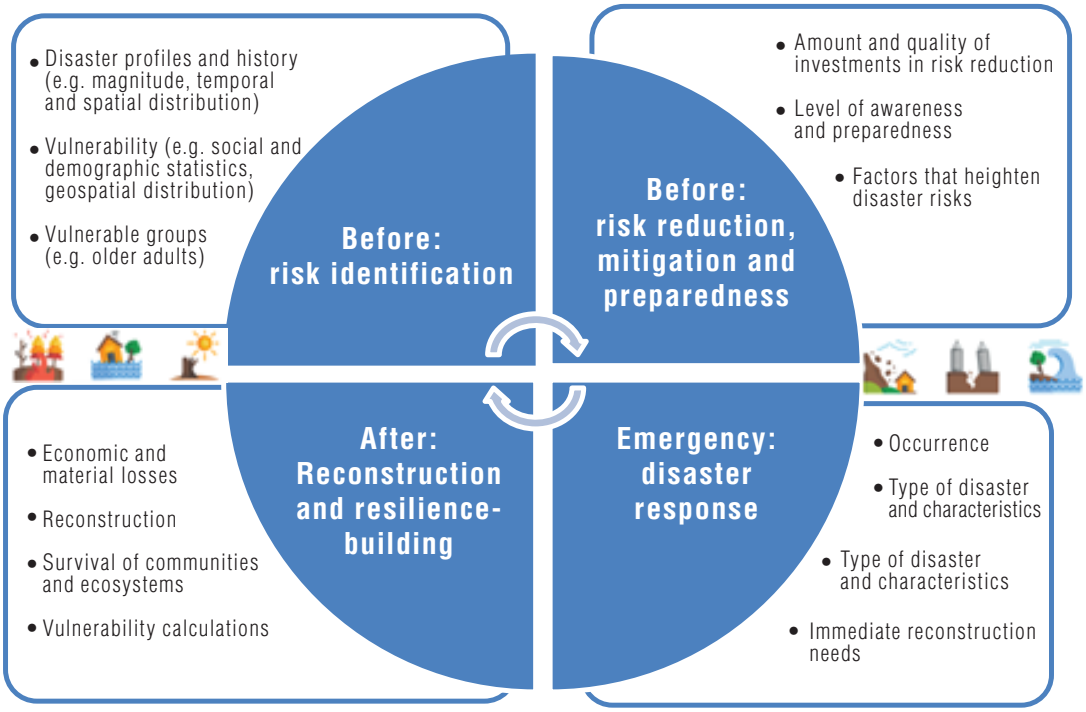


Source: Prepared by the authors.

1. What do disaster-related statistics measure?

While both the Sendai Framework and the Sustainable Development Goals define important disaster-related concepts and indicators for monitoring purposes, agreement still has to be reached on other statistical concepts and definitions as a basis for the development of specific, harmonized technical instructions and recommendations for the compilation and dissemination of disaster statistics. Some of the basic requirements in this respect are international and temporal comparability of concepts and methods of measurement not only for the characteristics of a disaster (date, magnitude, affected areas, etc.) but also for prior risk identification, disaster risk prevention, and reconstruction and resilience-building efforts (see diagram III.2).

Diagram III.2
Disaster-related statistics



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Economic and Social Commission for Asia and the Pacific (ESCAP), *Disaster-Related Statistics Framework (DRSF)*, May 2018.

B. Tools for constructing disaster-related indicators

At the international level, various types of tools for constructing disaster-related indicators have been made available, along with recommendations regarding their development. The Framework for the Development of Environment Statistics (FDES)—the international standard for environmental statistics issued by the United Nations Statistical Commission—provides an organizing structure for the compilation of statistics on the environment, climate change and disasters.

1. Framework for the Development of Environment Statistics (FDES)

Component 4 of the Framework refers to basic statistical variables that are needed in order to construct disaster occurrence and impact indicators. Component 6 deals with variables relating to preparedness, risk reduction and disaster management. Each subcomponent, the issues it addresses and the corresponding statistics are listed in table III.1.

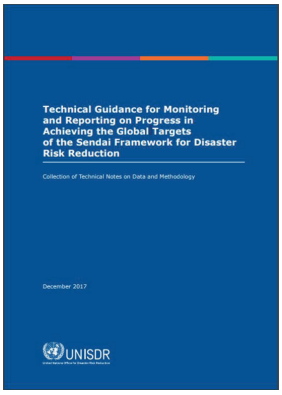
Table III.1
Framework for disaster-related environmental statistics and indicators

Subcomponent	Issues	Statistics
4.1 Natural extreme events and disasters	4.1.2: Impact of natural extreme events and disasters	4.1.2.a People affected by natural extreme events and disasters
		4.1.2.a.1 Number of people killed
		4.1.2.a.2 Number of people injured
		4.1.2.a.3 Number of people homeless
		4.1.2.a.4 Number of people affected
		4.1.2.b Economic losses due to natural extreme events and disasters (e.g. damage to buildings and transportation networks, loss of revenue for businesses, utility disruption)
		4.1.2.c Physical losses/damage due to natural extreme events and disasters (e.g. area and amount of crops, livestock, aquaculture, biomass)
		4.1.2.d Effects of natural extreme events and disasters on integrity of ecosystems
		4.1.2.d.1 Area affected by natural disasters
		4.1.2.d.2 Loss of vegetation cover
		4.1.2.d.3 Area of watershed affected
		4.1.2.d.4 Other
6.3 Extreme event preparedness and disaster management	6.3.1: Preparedness for natural extreme events and disasters	6.3.1.a National natural extreme event and disaster preparedness management systems
		6.3.1.a.1 Existence of national disaster plans/programmes
		6.3.1.a.2 Description (e.g., number of staff) of national disaster plans/programmes
		6.3.1.a.3 Number and type of shelters in place or ready to be deployed
		6.3.1.a.4 Number and type of internationally certified emergency and recovery management specialists
		6.3.1.a.5 Number of volunteers
		6.3.1.a.6 Quantity of first aid, emergency supplies and equipment stockpiles
		6.3.1.a.7 Existence of early warning systems for all major hazards
		6.3.1.a.8 Expenditure on disaster prevention, preparedness, clean-up and rehabilitation

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *Framework for the Development of Environment Statistics (FDES 2013)* (ST/ESA/STAT/SER.M/92), New York, 2017.

2. Technical guidance for monitoring and reporting on progress in achieving the global targets of the Sendai Framework for Disaster Risk Reduction

Another very important tool at the international level is the manual entitled *Technical Guidance for Monitoring and Reporting on Progress in Achieving the Global Targets of the Sendai Framework for Disaster Risk Reduction,* prepared by the United Nations Office for Disaster Risk Reduction (UNDRR). This manual provides technical notes for use in defining concepts and calculating each one of the 30 Sendai Framework indicators.



The demand for primary statistics for use in calculating the Sustainable Development Goal indicators (including environmental and disaster-related indicators) on an ongoing basis is both an opportunity and a challenge for national statistical systems in Latin America and the Caribbean. As is also true at the international level, aspects of environmental statistics such as the measurement and construction of indicators are the areas in greatest need of reinforcement because they are so new. This includes the monitoring and assessment of environmental, climate-related and disaster-related dynamics as a basis for identifying and answering questions such as "What happened?" and "What has changed or what are the effects?", for determining what mitigation and adaptation measures are called for, for calculating recovery and prevention costs and so forth.

C. Institutional structure and statistical capacity for disaster-related measurements

For the compilation of both environmental and disaster-related statistics, national statistics offices use the following data sources (see diagram III.3):

(i) Censuses (population, housing, economic, agricultural and business censuses)

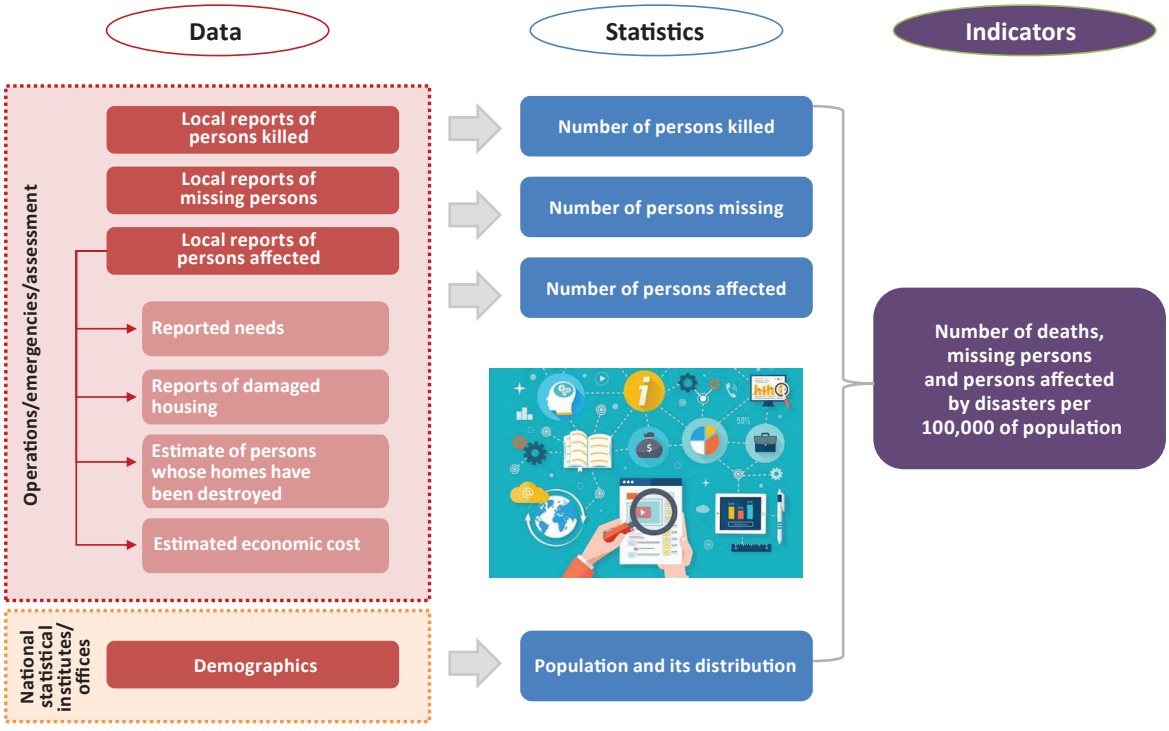
(ii) Surveys (household, employment, economic and environmental surveys)

(iii) Administrative records (of ministries, services, bureaus and offices dealing with such matters or resources as health, water, energy, forests, fisheries, education and the budget)

(iv) Remote sensing (satellite imagery of forested areas)

(v) Monitoring systems (of water quality, air pollution, climate and land use)

Diagram III.3
Main stages of data compilation for the production of disaster-related statistics and indicators



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

1. Disaster measurement capacity of the countries of Latin America and the Caribbean

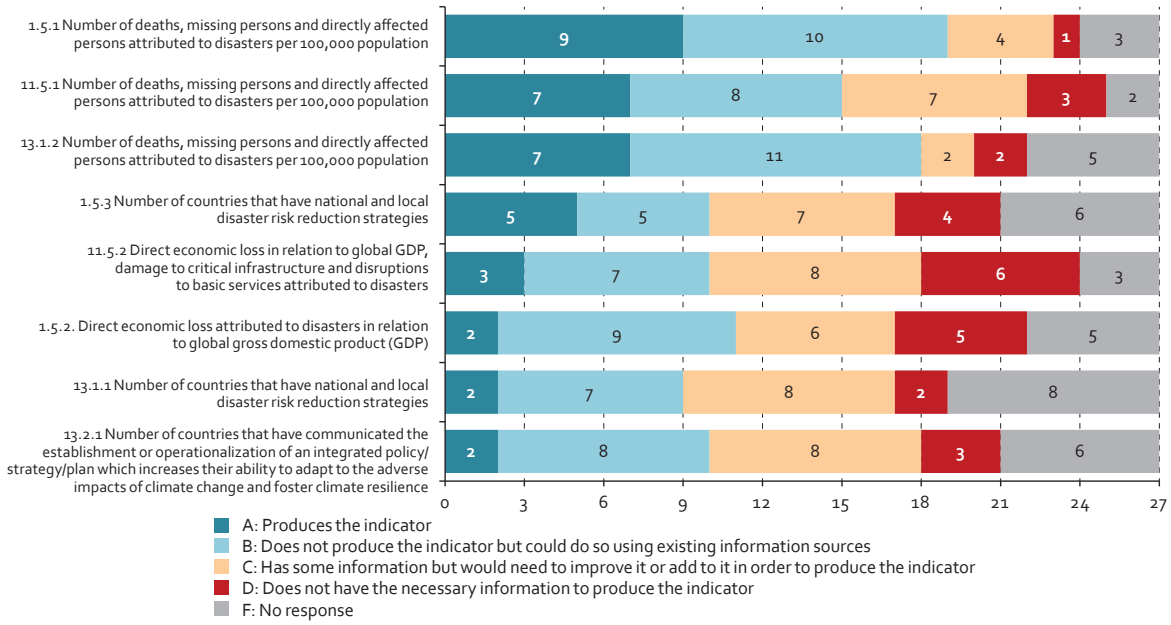
The production of extreme event, disaster and disaster risk reduction (DRR) indicators poses some formidable challenges in the region, and one of those challenges has to do with obtaining robust data inputs.

In addition, there is no tradition of collaborative work among the main bodies responsible for disaster-related statistics because the various institutions have differing mandates. For example, national statistical institutes work with a longer time horizon, while decision-makers responsible for mounting a disaster response effort need information on the spot. Another factor is the complexity of the impacts of a disaster, which can only be gauged if information is obtained from a wide variety of sources. This means that many different types of organizations need to coordinate their efforts, including some that national statistical institutes are not accustomed to dealing with, such as insurance companies and non-governmental organizations. Yet another challenge is posed by the fact that these indicators need to be constructed from a wide range of data sources, such as administrative records, surveys and remote sensing devices, which may not match up with one another.

In order to evaluate the capacity for producing disaster-related indicators in the region, in 2016 ECLAC surveyed 43 countries and territories in Latin America and the Caribbean.[8] Only between 2 and 9 of the 27 countries or territories that responded stated that they were producing disaster-related indicators, with the most commonly produced indicator being the numbers of persons killed, missing and directly affected by disasters out of every 100,000 inhabitants. Most of the survey respondents indicated that they were in one of the following situations: (i) they do not produce this indicator, but they have the information that they would need in order to do so; (ii) they would need better information to produce the indicator; or (iii) they have none of the information that they would need in order to produce the indicator.

The main reasons given for not producing this type of indicator were: (a) the absence of a demand for these indicators at the time (2015); (b) the fact that a consensus-based international methodology had not been developed; and (c) other problems, such as a lack of the technical and economic capacity to develop such indicators.

Figure III.1
Production of Sustainable Development Goal indicators on disaster risk reduction



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

[8] See [online] https://sdgstatsurvey.cepal.org/.

The United National Office for Disaster Risk Reduction (UNDRR) conducted a similar survey, but with worldwide coverage, on the availability of data for the construction of Sendai Framework indicators in 2017. That survey was sent to 27 countries in the region, of which 17 responded and provided specific answers to questions about the availability of data on infrastructure damage and damage in the farm sector. Under the heading of infrastructure damage, most of the respondents stated that they compiled data on housing, schools, health-care facilities and critical infrastructure that was damaged or destroyed by disasters. Fewer compiled these types of data on tourism or commercial infrastructure. The situation appears to be somewhat better in the farm sector, as most of the countries said that they have information on damage caused by disasters in agricultural areas and to crops and livestock herds and that this information is disaggregated by geographic area and type of event (UNDRR, 2017b).

2. The role of national statistical offices

The compilation of disaster statistics and indicators requires inter-agency coordination and consistency between the national and subnational levels and particularly between national statistical systems and the authorities and institutions involved in disaster risk prevention, such as disaster response personnel, meteorologists, the ministries responsible for health care, economic affairs, agriculture and housing, and local authorities.

In the past, national statistical offices were not very involved in the production of disaster-related statistical information, but these offices' role in this activity has now come to be seen as extremely important, particularly in the following areas:

- Performing core functions in the production and quality control of statistical series and indicators, mapping out lines of action for the generation of high-quality statistical information and meeting international standards relating to the social, economic, and environmental impacts of disasters
- Performing expanded functions and additional tasks which could include taking a leadership role in developing social vulnerability or geographic statistics and financial/budgetary statistics and in tallying statistical data with geographic and geospatial information.

Until a few years ago, many countries took differing approaches to the compilation of data and the preparation of statistics on disaster-related subjects. This reduced the comparability of their data and made it difficult to analyse time series encompassing multiple disasters.

This is why inter-agency cooperation in data compilation is so important. Disaster metrics are an inherently multi-domain, cross-cutting system. Different institutions and agencies in a wide range of sectors of society are called upon to furnish data (which may not necessarily be intended for statistical purposes) that serve as important inputs for the production of statistical series—series that these same institutions then use. This is why there is a need for working groups composed of many different stakeholders to develop metrics for statistical purposes.

More than 10 countries of the region are currently part of a working group of the Statistical Conference of the Americas which is furthering the development of disaster-related indicators by, for example, devising tools for determining the availability of disaster-related data and methodological approaches for the creation of disaster classification systems at the national or regional level.

The production of spatially and temporally comparable disaster-related statistical series and indicators (see diagram III.4) requires the following:

(i) Technical capacity: inter-agency training and technical assistance capacity to support the work being done by the countries of the region;

(ii) Institution-building: political will and resources for:

(a) Inter-agency cooperation

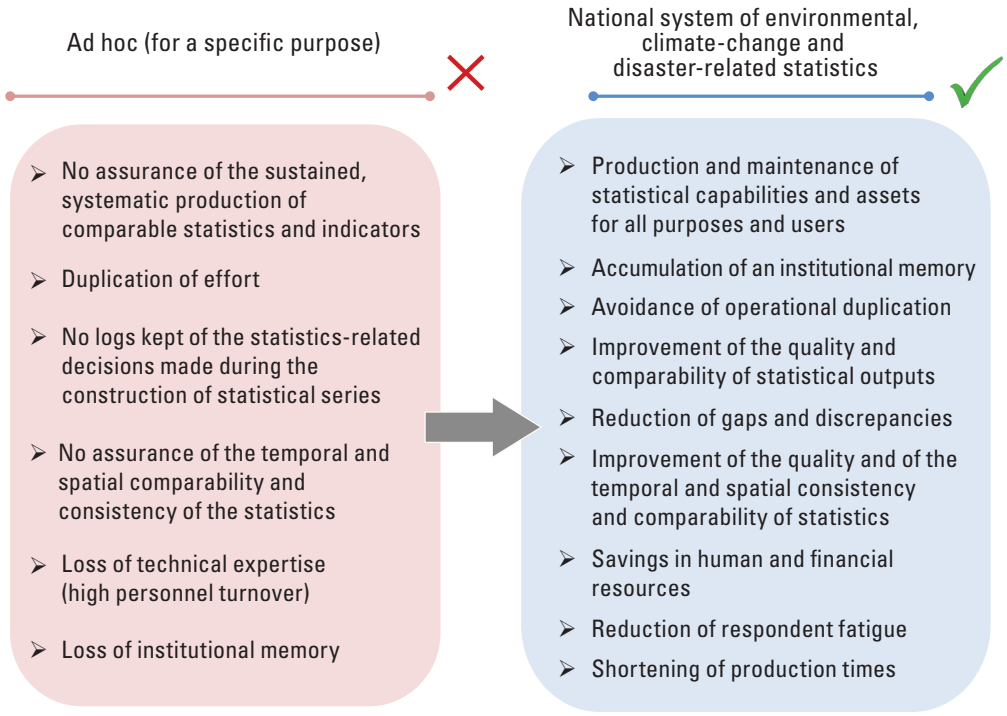
(b) Intra-agency cooperation

(c) Institutionalization of specialized environmental statistical units with:

- sufficient resources
- the same hierarchical level as economic and social statistical units within the organization;

(iii) Sufficient resources for the development of a national system of environmental, climate-change and disaster-related statistics.

Diagram III.4
Transition from the ad hoc production of statistics to a multi-purpose national statistical system (environmental, climate-change and disaster-related statistics)



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

As has been seen throughout this discussion, national statistical systems need to be strengthened, particularly in terms of their institutional structures, in order to support the follow-up to disaster-related goals. Steps need to be taken to clearly define the role of each institution in compiling and processing information and in furnishing data on each variable covered by the Sendai Framework, the 2030 Agenda and other development agendas (e.g. the Paris Agreement and the New Urban Agenda) in order to clarify the role of national statistical offices and to harmonize these types of statistics in the region.

IV. Conclusions

The increasing frequency of meteorological, climate-related and hydrological disasters in the region in recent years and the magnitude of their social, economic and environmental impacts make this a highly important issue for the region and a critical obstacle to its sustainable development. In Latin America, disasters are localized phenomena that may generate differences between one area of a country and another or even within a given area.[9] In the small islands of the Caribbean, on the other hand, a disaster caused by a hurricane, for example, may engulf an entire nation. The COVID-19 crisis demonstrates that the scope of a disaster can also be worldwide and that, in such cases, individual national responses are not enough but must instead be mounted in cooperation with other countries and regions. This crisis is still in full swing and is not only putting the coping capacity of the entire world to the test but is also triggering the collapse of public and private health-care systems and undercutting economic activity around the globe. Important lessons will be drawn from this experience at the national and international levels, both for disaster risk management and for national planning processes.

National and subnational planning processes take on all the more importance in this context, as the entire institutional structure is called upon to meet the complex challenges of disaster risk reduction in ways that will have ramifications for all the various dimensions of development. At the international level, the lines of action for this new institutional structure have been set out in the 2030 Agenda for Sustainable Development, the preeminent agreement reached within the United Nations system that charts a road map for coping with disasters and for the information systems required for its follow-up. The 2030 Agenda is complemented by a network of other global frameworks, such as the Sendai Framework, the New Urban Agenda and the Addis Ababa Agreement. These agreements call for institutional action based on new ways of thinking and a vision of sustainable development as an integral process. A little more than four years after having assumed the commitments set out in the 2030 Agenda, the countries of the region are faced with the formidable challenge of making disaster risk management an integral and cross-cutting component of national instruments for the furtherance of the development process.

A sustainable development strategy must embed disaster risk management in the development planning process and continue to build greater resilience into system operations. Such a strategy must include avenues for surmounting three key challenges posed by the need for long-term strategies,

[9] Rodríguez-Oreggia and others (2013) have highlighted the negative social impacts of disasters at the municipal level in Mexico.

multisectoral approaches and multi-stakeholder lines of action. The eruption of a health and humanitarian crisis without precedent in the past century has brought to light the shortcomings that exist in these three areas, as has been pointed out by Alicia Bárcena, Executive Secretary of ECLAC.[10]

Suitable long-term strategies will help the countries to anticipate and be better prepared for coping with disasters; inter-agency coordination is an essential underpinning for effective policy and operational decisions, and the coordination of all stakeholders in a society is perhaps the most fundamental mechanism for dealing with a crisis and emerging from it. ECLAC has called attention to the need for a paradigm shift because the prevailing paradigm does no more than to perpetuate inequalities and block the transition to sustainable development. The State-market-society equation is the cornerstone for a new type of compact founded upon a strategy based on the "three Cs": collaboration, cooperation and confidence. That strategy must also guide a disaster response based on other values, on a different ethic. Public policies, planning processes and budget allocations must all be coordinated on the basis of new, integrated approaches for meeting the complex challenges now facing our region.

[10] See "Launch of ECLAC's Special Report COVID-19 No. 1" [online] https://www.cepal.org/en/videos/launch-eclacs-special-report-covid-19-1.

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A disaster can cause countries to lose the economic and social ground that they have worked for decades to gain and can have even more severe impacts on the most vulnerable groups in their populations. The extent of its impacts will depend on the countries' ability to identify and address their vulnerabilities.

This study, which is intended for use by policymakers, in particular, explores the ways in which development planning can lay the foundation for a comprehensive transition from disaster management to disaster risk management. It advocates the adoption of system-based approaches, in keeping with those outlined in global development frameworks, and the attainment of a fuller understanding of the nature of disaster risk that will pave the way for new lines of research and for new methodologies and opportunities for planning before, during and after a disaster.

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