



Climate Change and IDB: Building Resilience and Reducing Emissions

Sector Study: Disaster Risk Reduction



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Office of Evaluation and Oversight

1350 New York Avenue, N.W.

Washington, D.C. 20577

www.iadb.org/evaluation

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

PREFACE

OVERVIEW

I.	THE STATE OF NATURAL DISASTERS IN LAC	1
	A. Types of disasters in LAC	1
	B. The effects of climate change on natural disasters	4
	C. Areas affected by disasters and potential impacts from climate change	6
	D. The state of disaster risk reduction efforts in LAC.....	7
II.	THE IDB’S DRM STRATEGY	8
	A. Climate change and the IDB DRM Strategy	9
	B. Country Strategies and DRM.....	12
III.	IDB’S DRM PORTFOLIO	13
	A. DRM portfolio description	13
	B. DRM and climate change.....	18
IV.	PORTFOLIO ANALYSIS	21
	A. Results on prevention	23
	B. Results on response to disasters.....	27
V.	CONCLUDING REMARKS	29

REFERENCES

INTERVIEWS

ANNEXES

This sector study was conducted by Maximillian Ashwill and Lourdes Alvarez as an input for the evaluation *Climate Change and the IDB: Building Resilience and Reducing Emissions*.

ACRONYMS AND ABBREVIATIONS

BDC	Caribbean Development Bank
CC	Climate change
CCA	Climate change adaptation
DRM	Disaster risk management
EM-DAT	Emergency Events Database
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
HFA	Hyogo Framework for Action
IDB	Inter-American Development Bank
IPCC	Intergovernmental Panel on Climate Change
IRC	International Rescue Committee
LAC	Latin America and the Caribbean
OAS	Organization of American States
OECD	Organization for Economic Cooperation and Development
PBL	Policy Based Loan
PCR	Project Completion Report
PMR	Project Monitoring Report
TC	Technical cooperation
UN	United Nations
UNDP	United Nations Development Programme
UNISDR	United Nations Office for Disaster Risk Reduction
USAID	United States Agency for International Development
WRI	World Risk Index

PREFACE

Climate change (CC) poses important risks to development in Latin America and the Caribbean (LAC). Climate adaptation can limit the negative impacts and is important in achieving sustainable development and equity, including poverty reduction and economic growth. Integrating CC mitigation into development work is also an opportunity to foster and support the design and implementation of sustainable projects, programs and policies. Low-carbon alternatives contribute to more sustainable development. LAC countries are increasingly incorporating CC in their national policy agendas and aim to reduce GHG emissions and build climate resilience and the IDB has supported these efforts in the Region.

In 2013-2014, the Office of Evaluation and Oversight (OVE) carried out an evaluation of IDB's support for CC mitigation and adaptation (RE-459). This is OVE's first evaluation of IDB's interventions and institutional set-up related to CC. The evaluation seeks to document and to draw lessons from the recent IDB experience related to CC (2004-2014). It focuses on IDB-financed operations in important climate-related sectors—agriculture and natural resources, energy, disaster risk management, and transport—that directly support climate resilience-building (adaptation) or GHG emissions reduction (mitigation) or that have these outcomes as co-benefits. A number of background papers were produced for the evaluation and this is paper is one commissioned by OVE to support the overall CC evaluation.

OVERVIEW

The purpose of this paper is to evaluate the involvement of the Inter-American Development Bank (IDB) in disaster risk management (DRM) as it relates to climate change (CC) in Latin America and the Caribbean (LAC). The paper first describes the state of natural disaster risk in the region, including the sources of risk and the most vulnerable areas and people. Next it looks at LAC's progress in reducing disaster risk and examines the major challenges that still confront the Region. It describes and analyzes the IDB's DRM and CC strategies, and the links between them. It also describes and analyzes the IDB's DRM portfolio and assesses the IDB's DRM work. Finally, it makes recommendations to improve the IDB's effectiveness in this area.

The paper shows that disaster risk is increasing in LAC, and though the Region has made major strides in preparedness and emergency response, it is still lagging in terms of prevention. It shows that the IDB has been highly involved in building preparedness in some countries and is beginning to position itself to better support disaster prevention as well. It also finds that climate change is adding a layer of complexity and uncertainty to disaster risk, and that there is a serious lack of resources and capacity, especially at the local level, to manage risk. In evaluating the IDB's climate change and disaster risk management strategies, the paper argues that the IDB is well positioned and has demonstrated great potential to reduce disaster risk and build climate change adaptation, but has not achieved this potential consistently. Furthermore, the IDB has been working in accounting for climate change, especially from a conceptual and institutional viewpoint, in disaster risk policy. During the period 2004-2013 the effectiveness of IDB's DRM portfolio has been limited by implementation problems that are linked to governments' lack of institutional capacity and financial resources, together with a lack of studies and knowledge products to better prepare programs and improve governments' knowledge on CC and DRM issues. However, with the introduction of the DRM policy in 2007 and its guidelines in 2008, the IDB has improved its work in developing knowledge products and its cross-sector collaboration to better integrate CC Adaptation and DRM. The IDB has also demonstrated the capacity to contribute to the implementation of institutional reforms based on the Region's best practices through policy-based loans..

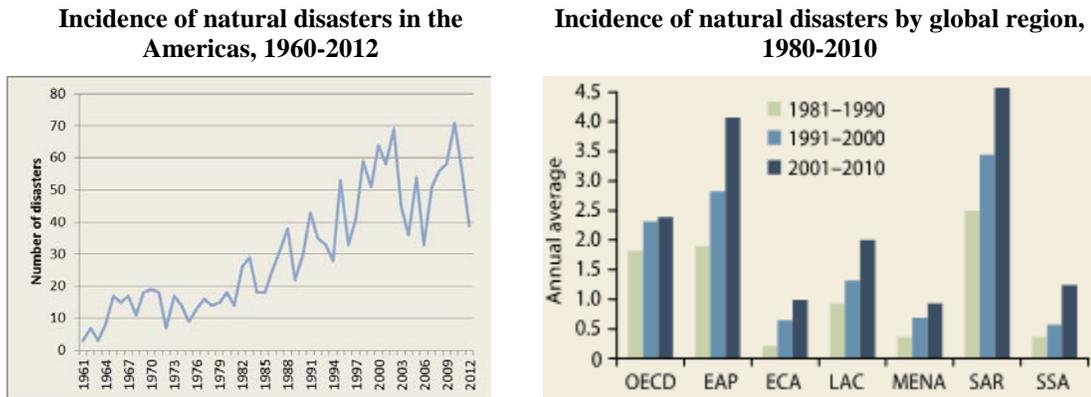
OVE makes the following suggestions to improve the IDB's work in this area:

- Define a consistent disaster risk management and climate change adaptation strategy that properly conceptualizes both themes in an integrated climate risk management framework.
- Provide guidance to client countries through studies and knowledge products that allow for better risk assessment at project design and a clear definition of targets.
- Focus on institutional capacity-building activities both at the national and at the subnational level, helping governments address DRM and CC adaptation, especially through prevention and preparedness through different instruments, as PBLs, investment programs and TCs.

I. THE STATE OF NATURAL DISASTERS IN LAC

- 1.1 **The frequency of natural disasters is increasing in Latin America and the Caribbean (LAC), as in the rest of the world** (see Figure 1). Natural disasters are commonly defined as natural hazard events – floods, droughts, hurricanes, earthquakes, etc. – that cause significant human and economic losses. During the 1960s and 1970s there were on average fewer than 20 disasters per year, while during the 2000s there were on average more than 50 per year (EM-DAT, 2014)¹. Still, society’s ability to protect people from these disasters has improved dramatically. For example, from 1900 to 1960, each disaster caused, on average, over 1,800 deaths; by contrast, from 1980 to 2012, each disaster caused, on average, only about 100 deaths. Disasters are also becoming costlier in the Region. During the 1970s, on average, damages were just over US\$700,000 per year; however, during the 2000s, average damages were over US\$3 million per year. The trend is clear: more disasters, fewer deaths, and greater costs.

Figure 1. Disaster occurrence over time



Source: EM-DAT, 2014.

Source: World Bank, 2014b².

A. Types of disasters in LAC

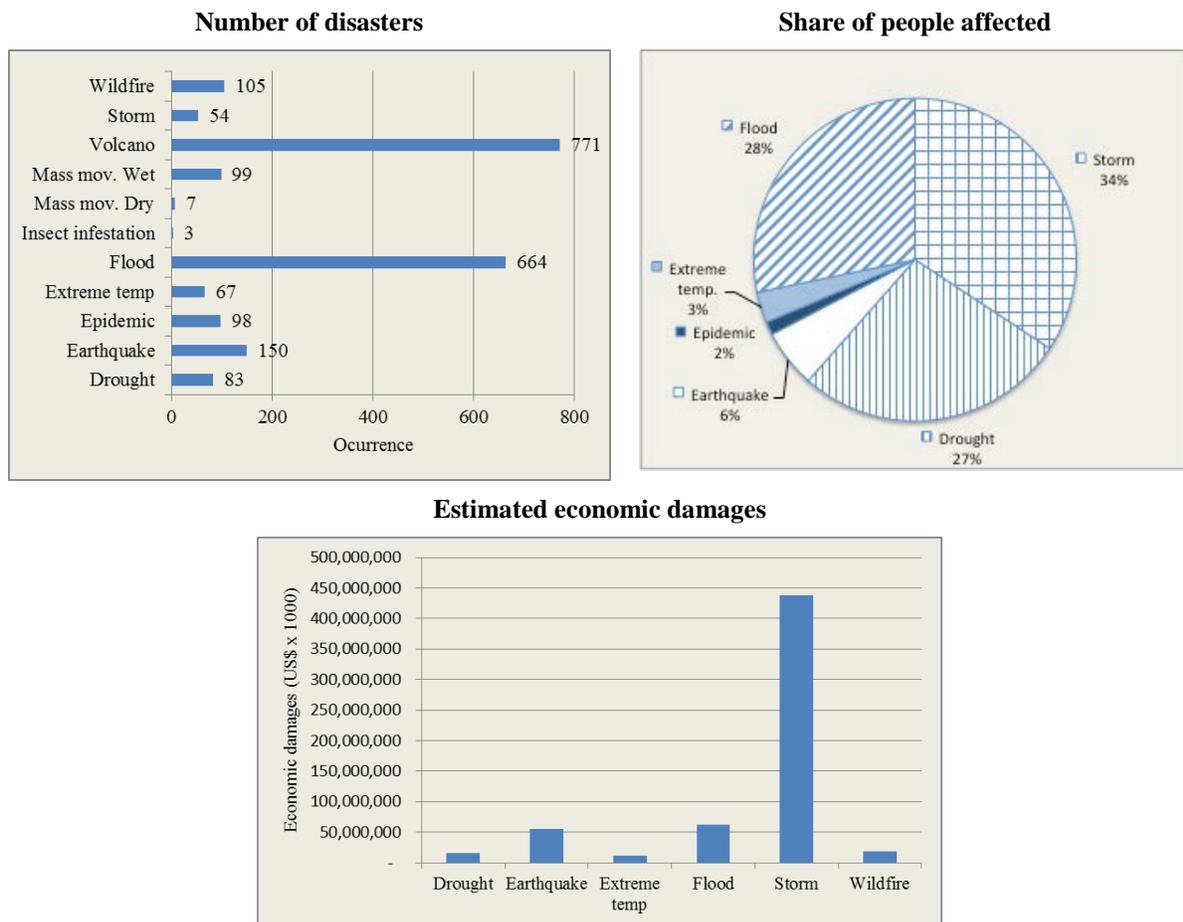
- 1.2 **A variety of natural disasters are occurring in LAC.** As Figure 2 illustrates, according to the Emergency Events Database (EM-DAT³), storms and floods are

¹ EM DAT severely underestimates the losses and damages (it only registers larger events). In particular landslides and flooding are underestimated since these often cause localized damage only. The World Bank has done analysis of some countries in LAC using DesInventar data (more data points but fewer countries are covered) that indicates that EM DAT probably underestimates damages by at least 50%.

² Figures show the simple average across countries in each region. OECD countries in the figure are high-income countries that have been members of the OECD for at least 40 years. All other countries are grouped into geographic regions. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.

the most commonly occurring types of disasters in LAC since 1980; storms, floods, and droughts have affected the greatest number of people; and storms have caused the greatest estimated damages. This is because cyclones usually cause damage to the coastlines, which are often the most developed, and also because these events carry powerful winds that are more likely than other hazard types to cause damage to infrastructure. Droughts are only the seventh most frequent disaster type, but they affect more people per event than any other disaster: they tend to affect large areas and consequently more people, than, say, storms, which hit more precise locations.

Figure 2. Disaster occurrence in LAC, by type of disaster, 1980-2010



Source: EM-DAT, 2014; www.preventionweb.org.

3

The Emergency Events Database (EM-DAT, 2014) qualifies a disaster as an event in which (i) 10 or more people are reported killed, (ii) 100 or more people are reported affected, (iii) there has been a declaration of a state of emergency, and (iv) there is a call for international assistance. While storms can contribute to flooding, to avoid duplication EM-DAT classifies storms only as tropical and extra-tropical cyclones and local storms, while flooding includes general floods, flash floods, and storm surges or coastal floods. Mass movements refer to rock falls, landslides, avalanches, and subsidence and are classified as wet or dry. Earthquakes include tsunamis; and although droughts may contribute to wildfires, these two disaster types are classified separately.

1.3 **The occurrence of disasters is not evenly distributed across the Region.** Some areas are more susceptible to certain disasters than others. Figure 3 shows the occurrence of disasters at a subnational/district level (Maynard-Ford et al., 2008). Nearly every corner of LAC has experienced a disaster over the past 30 years, but some—the areas around and just north of Rio de Janeiro and São Paulo, Brazil; north-central Colombia; certain highland areas in southern Peru and Bolivia; the districts surrounding Buenos Aires in Argentina; Cuba; and south-central Mexico— have experienced upwards of 30 disasters each.

Figure 3. Natural disaster occurrence, 1900-2007



Source: Maynard-Ford, et al., 2008.

B. The effects of climate change on natural disasters

- 1.4 **A link between increased disaster risk and climate change is not yet scientifically corroborated.** While it is true that global temperatures are increasing, it is unclear how big a role this change plays in the frequency or magnitude of disasters. According to the IPCC's Fifth Assessment Report (IPCC 2013a), globally averaged surface temperature data show a warming of 0.85°C between 1880 and 2012. This warming could increase the risk of drought, especially in regions where a lack of precipitation is a concern. There is also a scientific basis to suggest that higher air and ocean temperatures will increase the frequency and intensity of storms, but actual evidence has not been able to corroborate this. Using IPCC data, Christensen (2014) argues:

There is low confidence that any observed long-term (i.e., 40 years or more) increases in tropical cyclone activity are robust, after accounting for past changes in observ[ed] capabilities. The uncertainties in the historical tropical cyclone records, the incomplete understanding of the physical mechanisms linking tropical cyclone metrics to climate change, and the degree of tropical cyclone variability provide only low confidence for the attribution of any detectable changes in tropical cyclone activity to anthropogenic influences. There is low confidence in projections of changes in tropical cyclone genesis, location, tracks, duration, or areas of impact.

- 1.5 **Despite the lack of hard evidence that climate change will lead to more frequent disasters, it is still expected that disaster occurrence will continue to climb.** The reason is that the occurrence of a disaster is not solely, or even mostly, dependent on its intensity, though this certainly plays a role. For a natural event to reach the level of “disaster” depends on many other social, economic, and environmental factors.⁴ Some of these factors include population growth, urbanization, poverty, and environmental degradation—and most of them can be exacerbated by climate change and can be mitigated by disaster risk reduction efforts.
- 1.6 **Larger populations contribute to natural disasters simply by placing more people and communities at risk.** For example, according to CDKN (2012:3) the population in coastline regions of the Gulf of Mexico increased by 150% from 1960 to 2008, and “some literature also indicates that hurricane losses, when corrected for population and wealth in LAC have not increased since the 1940s; and that growing population and assets at risk are the main reason for increasing impacts.” LAC’s population grew from 422 million in 1990 to 581 million in 2012 (World Bank 2014a); and a larger population also means a denser

⁴ A disaster is defined by UNISDR (2009) as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.” When a natural hazard—defined as, “a natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage”—is the principal cause of a disaster, the event is called a “natural disaster.”

population, which makes it more likely that many people will be present when a natural hazard occurs.

1.7 **To accommodate the growing population, cities have expanded, contributing to disaster risks.** In LAC, more than 75% of the population lives in cities, the highest proportion in the developing world (World Bank, 2011). It is estimated that 14% of LAC's urban population lives in large cities like Mexico City, São Paulo, Rio de Janeiro, and Buenos Aires (UN-Habitat, 2012). Even more people (39%) live in medium-sized cities (with populations between 100,000 and 500,000), a greater proportion of the urban population than in any other developing region (18% in Asia, 16% in Africa) (UN-Habitat, 2012). Urbanization can contribute to the occurrence of natural disasters, especially when it takes place in areas that are prone to natural hazards, or when it degrades the natural environment or neglects important public works. Areas in, say, low-lying, flood-prone areas, or on unstable slopes with low-quality infrastructure, are typically cheaper to settle on, and as a result attract the poorest settlers. According to UN-Habitat (2008), 25 million people live in low-lying urban coastal areas in LAC. Of the cities in the world that are most vulnerable to rising sea levels, 904 (27%) are in LAC. It is also estimated that nearly half of the population in LAC—nearly 300 million people—lives within 100 kilometers of the coast and is therefore vulnerable to coastal hazards.

1.8 **It is well established that poor people are at greater risk of being affected by natural disasters.** Poor people are more likely to settle in hazard-prone areas and less likely to be able to reduce the risk of disasters (Annex A discusses social vulnerability in greater depth). LAC countries have done a good job at reducing poverty rates – the share of the population living in extreme poverty fell from 12% in 1981 to 5.5% in 2010.⁵ However, because of population growth, the reduction in poverty rates has not resulted in reduced numbers of people living in poverty⁶; therefore, disaster risk has not been reduced. In the developed world, where repairs are more costly, the relative value of damages caused by natural disasters tends to be higher than in the developing world. However, the economic impact in developing countries is often higher relative to the size of their economies (World Bank and United Nations, 2010). In addition, property in the developing world is less likely to be insured, making recovery more difficult.⁷ It is estimated that only 1% of losses associated with natural hazards are insured in low and middle-income countries, compared to 30% in high-income countries (Linnerooth-Bayer et al., 2011). Evidence also suggests that when disasters occur,

⁵ World Bank (2014a).

⁶ While the number of people living in extreme poverty (less than US\$1.25/day) had declined from 43 million in 1981 to 32 million in 2010, this is much less than the poverty rate, which was cut in half. Also, the number of people living in poverty (less than US\$5/day) has hardly changed, from 209 million in 1981 to 207 million in 2010, despite poverty rates dropping by 22 points (World Bank, 2014a).

⁷ For example, the ratio of total losses to insured losses from natural disasters in the United States is typically between 2 and 4, whereas in China it has often been close to 50. See Kunreuther and Michel-Kerjan 2012.

wealthier households are better able to access savings or borrow money to help them recover, while poorer households are much more likely to sell critical productive assets (Agrawal et al., 2011).

- 1.9 **Finally, environmental degradation can lead to greater disaster risk.** Natural vegetation, like trees and shrubs, helps absorb and clean rainwater, stabilize slopes, and retain moisture through a dry spell. Maintaining these areas can become a major component of disaster risk reduction. It is estimated that 80% of poor people in Latin America live in fragile ecosystems:

According to data from the GEF-UNEP-FAO project GLADA (Global Assessment of Land Degradation and Improvement), 14% of the world's land degradation occurs in Latin America and the Caribbean, and the process affects approximately 150 million of the Region's inhabitants. The problem is most serious in Mesoamerica, where it affects 26% of the land, while in South America 14% of the land is affected. Guatemala has the highest proportion of degraded land (51.3% of its national territory), followed by Uruguay (49.6%), Guyana (43.4%) and Haiti (42.6%)(UNEP, 2010:71).

C. Areas affected by disasters and potential impacts from climate change

- 1.10 **Floods are one of the most common disaster type in the Region.** Most LAC countries have experienced a flood disaster (Maynard-Ford et al., 2008) (Figure B1. Annex B). The areas most frequently affected by flooding are located along the coastlines and near major rivers or other inland water sources. Still, floods have affected even drier areas like northern Mexico and Northeastern Brazil—usually flash flooding (a sudden local flood), not general flooding. The IPCC (2013b) projects that the Amazon region and the northern and southern parts of South America will all see increases in precipitation under most CO₂ emissions scenarios. This does not bode well for the already flood-prone areas surrounding the major population centers of São Paulo, Rio de Janeiro, and Buenos Aires. In fact, climate change may already be contributing to increased disaster risk in these areas. For example in the western tropics of Brazil there have been unprecedented levels of precipitation and floods over the past several years—including floods and landslides in Santa Catarina in 2008, heavy rains in Alagoas and Pernambuco in 2010, and flash floods and landslides in the state of Rio de Janeiro in 2011—with more than one million Brazilians affected (World Bank, 2012).
- 1.11 **Storms cause more economic damage than all other disasters combined.** Mexico, Central America, and the Caribbean are the most frequently affected by destructive windstorms (Maynard-Ford et al., 2008) (Figure B2 in Annex B). Also, as can be expected, the countries most at risk for storm disasters are situated on the Caribbean hurricane belt. These countries also tend to be the most resilient to the magnitude of these storms, although one estimate finds that they are generally unprotected against the additional economic damages associated with more frequent disasters (Hsiang, 2012). In other words, while certain countries may be resilient to single disaster events, they are not prepared for their increased occurrence. While earlier IPCC reports (2007) theorized that climate change could increase the frequency and magnitude of storms, scientific evidence to date

has not supported this, and the IPCC (2013) itself has backed off from such bold predictions. Scientific evidence has shown that there has not been a noticeable increase in the occurrence of these storms, only that disasters associated with these storms are more common. This has more to do with population dynamics, environmental degradation, and unplanned urban expansion than with climate change. Still, what can be stated with certitude is that climate change will not reduce the risk of storm disasters.

- 1.12 **Drought disasters tend to occur in areas that are already dry**—for example, northern Mexico, some Andean highland areas, Northeastern Brazil, and Paraguay’s Chaco Region (Maynard-Ford et al., 2008) (Figure B3 in Annex B). The IPCC (2013) projects⁸ that maximum temperatures (the frequency of warm and cold days), minimum temperatures (the frequency of warm and cold nights), and the frequency of heat waves/warm spells will increase for all of LAC over the next 50-75 years. It further projects that there will be increased likelihood of dryness and drought in northern and central Mexico and Northeastern Brazil, the two areas in LAC that are already the most frequently affected by drought disasters.
- 1.13 **Landslide disasters are often related to heavy rains and tend to occur in mountainous or hilly areas, which can become unstable with precipitation.** Landslide disasters have most commonly occurred in such areas as the Andean countries and northern Brazil (Maynard-Ford et al., 2008) (Figure B4 in Annex B).

D. The state of disaster risk reduction efforts in LAC

- 1.14 **There have been some improvements in disaster risk management (DRM) in LAC, particularly in terms of building preparedness and improving emergency response.** However, the Region still faces significant challenges in terms of disaster prevention (risk assessment) and research. The Hyogo Framework for Action (HFA), adopted by the UN General Assembly in 2005, is the first internationally agreed framework for DRM. It outlines a 10-year plan (2005-2015) for countries to reduce their disaster risk through five priority areas ranging from improving preventive and preparedness measures to generating knowledge. The LAC Region has achieved some of these goals (i.e., improved preparedness, civil protection) faster and more completely than it has others, such as reducing the underlying risk factors for disasters (poor urban planning, aging infrastructure, unsustainable environmental practices, etc.) (The Organization of American States (2011) has reported on LAC’s progress in these areas; Annex C summarizes the findings.)
- 1.15 **In addition, there are recurring challenges to reducing disaster risks in LAC.** The most important and pervasive are (i) the practical constraints to concentrating more on preventing disasters than responding to them; (ii) the lack of local

⁸ Projections are for the period 2071-2100 (compared with 1961-1990) or 2080-2100 (compared with 1980-2000) and are based on GCM and RCM outputs run under the A2/A1B emissions scenario.

capacity to manage disasters; and (iii) governments' problems with coordination and conceptual clarity related to DRM. These three challenges are present to some degree in every LAC country, even in those—like Mexico and Colombia—that are considered advanced in their capacity to manage disaster risk (Annex D provides a case study of Mexico).

II. THE IDB'S DRM STRATEGY

- 2.1 **The IDB's DRM strategy has become more structured over time.** In 2005, the roots of this strategy were conceptualized in the Action Plan for Improving Disaster Risk Management 2005-2008 (GN-2339-1). This Plan, which was developed at about the same time as the HFA, focuses heavily on the need to improve disaster prevention. It lists five focus areas: (i) risk analysis to identify the types and magnitude of potential impacts that member countries face and that affect development investments; (ii) prevention and mitigation measures to address the structural and nonstructural sources of vulnerability; (iii) financial risk management to provide coverage for contingent liabilities arising from disaster risk exposure; (iv) emergency preparedness and response to enhance countries' readiness to cope quickly and effectively with an emergency; and (v) post-disaster rehabilitation and reconstruction to support effective recovery and to safeguard against future disasters. The definition of DRM in the 2011 Climate change strategy (GN-2609) leaves out “post-disaster rehabilitation and reconstruction” and replaces it with “institutional capacity building.” It is unclear whether this was an intentional modification to reflect the actual DRM portfolio, which is made up largely of institutional capacity-building initiatives and has almost nothing on rehabilitation and reconstruction.
- 2.2 **In 2008, linked with the IDB DRM Policy (GN-2354) approved in 2007, the IDB issued the *Disaster Risk Management Policy Guidelines*, setting out four ways the IDB would integrate the DRM strategy into operations.**
- *Programming*: a stand-alone DRM sector program providing loans and grants to help borrowing member countries better manage their disaster risk.
 - *Risk and project viability*: the systematic promotion and incorporation of DRM during project preparation and execution, with the objective of reducing risk to levels that are acceptable to the Bank and the borrower.
 - *Loan reformulation*: the reallocation of resources from existing loans to other projects under certain circumstances, in the aftermath of disasters.
 - *Reconstruction*: the revitalization of development efforts in the aftermath of disasters, accompanied by precautions to ensure that rehabilitation and reconstruction projects do not lead to increased vulnerability.

In earlier discussion papers there was also a fifth intervention—to provide humanitarian aid to countries in need; however, it was decided that the IDB had no comparative advantage in this area, so it was removed from the final version of the guidelines.

- 2.3 **The guidelines also list all the instruments the IDB has at its disposal to put these strategies into action, in addition to its normal lending and technical cooperation (TC).** To identify, prevent, or mitigate risk and prepare for disasters, it has the Disaster Prevention Sector Facility, the Disaster Prevention Fund, and the Multi-donor Disaster Prevention Trust Fund. For emergency response, it has the Immediate Response Facility, Emergency Technical Cooperation, and Special Procurement Procedures for Emergency Situations. Emergency loans and contingency loans are also available to countries that have suffered or could suffer the effects from disasters.

A. Climate change and the IDB DRM Strategy

- 2.4 **At the IDB, the conceptual relationship between DRM and climate change (CC), especially climate change adaptation (CCA), is weak.** The DRM agenda has in part been appropriated by the CC agenda. While the 1994 *Report on the Eighth General Increase in the Resources of the Inter-American Development Bank* (IDB8) does not include either disaster risk or climate change as priority areas, the 2010 *Report on the Ninth General Increase in the Resources of the Inter-American Development Bank* (IDB9) includes climate change as a major priority area and identifies the prevention of natural disasters as a component under the umbrella of CCA. This is the first documented mention of how the IDB views the relationship between CC and DRM (see Box 1).

Box 1. DRM and CC coexist, but without specific guidelines

The 2005 *Action Plan* was the IDB's first articulation of disaster risk management, focused heavily on disaster prevention. Later in 2005, the IDB produced a *Disaster Risk Management Checklist* to help project managers take disaster risk into account while designing projects or programs. The checklist makes no mention of climate change.

In 2007, the IDB issued the *Integrated Disaster Risk Management and Financial Approach* discussion document to further integrate DRM into the IDB strategy and enable the poorest countries to continue to access disaster risk financing. It also prepared a White Paper called *Responding to Climate Change in LAC: The Role of the IDB*, and established the *Sustainable Energy and Climate Change Initiative*, the beginning of a concerted effort to bring climate change into the discussion. None of these documents elaborated on the relationship between DRM and CC.

In 2008, the IDB issued the *Disaster Risk Guidelines*. This document briefly mentions that climate change could exacerbate disaster risk but makes no attempt to explore in depth the relationship between the two concepts.

In 2009, the IDB created the *Sustainable Energy and Climate Change Unit* and then established a *Sustainable Energy, Climate Change and Disaster Risk Management Network for the Regional Policy Dialogue Initiative*. In June 2009, the IDB hosted a *Regional Policy Dialogue on Integrating CCA and DRM in Development Policy and Planning* in Panama City, Panama. There was still no formal discussion of the relationship between DRM and CC, at least not until May 2010 when the IDB9 made its small

reference to disaster prevention being a part of climate change adaptation.

In March 2011, the IDB published its *Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy*, which finally established the relationship between CC and DRM. The CC Strategy shows clearly that DRM would be a component of climate change adaptation. The strategy describes how “long-term adaptation actions should start with the development of comprehensive Disaster Risk Reduction strategies” (p. 8); in fact, the only time in the entire document that “long-term” adaptation is mentioned is in relation to how DRM can support it.

2.5 While the CC Strategy clearly makes an attempt to place DRM within CCA, it also seems to recognize that CCA and DRM do many of the same things.

The Strategy states:

To increase their resilience to climate, cities need to mainstream climate change and disaster risk management into urban development planning as well as prepare action plans for adaptation to climate change that include: (i) an analysis of the natural hazards to which they are exposed, (ii) adequate land use planning, (iii) integrated water resources management, (iv) disaster risk management, (v) the implementation of appropriate building codes that consider the potential impacts of climate change, and (vi) the identification of financing and risk transfer mechanisms (p. 7).

2.6 The Strategy further makes the case for the sameness of the two concepts when it states: “Both climate change adaptation and disaster risk reduction are strongly rooted in development practices; both share the ultimate goal of reducing vulnerability to weather and climate hazards, and of reducing disaster-related losses in terms of lives and social, economic and environmental assets.” It continues by arguing that “climate change adaptation and disaster risk reduction are complementary cross-cutting development dimensions that must be mainstreamed into national, sector, territorial, social, economic and environmental planning.”

2.7 **The CC Strategy implicitly promotes integrating CCA and DRM:** “To achieve such an integrated climate risk management framework for climate-resilient development, all relevant stakeholders –national and sub-national governments, local communities, organized civil society and private sector– need to be coordinated to develop integrated risk management strategies and action plans.” This reference to a fully integrated “climate risk management framework for climate-resilient development” is important. The IPCC (2011) recognizes the need to move toward “climate risk management” rather than thinking of climate adaptation and DRM as existing in separate silos.

2.8 **In none of the strategy papers is there an explicit mention of the IDB’s comparative advantage related to climate change in the DRM sector** (see Box 2).

Box 2. Global players in DRM

The comparative advantage of the IDB and the World Bank in DRM seems to be concentrated on disaster financing, using a combination of investment loans, policy loans, and technical assistance to help countries reduce their disaster risk. Both institutions have developed major contingency funds that governments can draw on in the wake of disasters—*contingency loans* at the IDB, and the *Drawdown Option for Catastrophe risks* for the World Bank. The World Bank’s DRM program in LAC has grown from 10 emergency response projects in 2004 to a portfolio of 25 investment and policy operations, with 40 TCs, in 2012. However, both banks hold a minor comparative niche with particular countries in the Region.

Other international and bilateral aid/development agencies play a specialized role in DRM in LAC, providing policy advice, technical training, and large development projects to reduce risk, all on grant terms. The United Nations Development Programme (UNDP), the most prominent of the international agencies, provides US\$150 million annually in 60 countries on disaster-related initiatives. UNDP is also the only agency that combines the concepts of disaster risk reduction and climate change adaptation, with a goal toward “Disaster Risk Reduction and Climate Risk Management.” UNDP has a single unit for the two efforts, with more specific subunits related to recovery, prevention, and adaptation. The United States Agency for International Development (USAID) is the most prominent bilateral aid agency across the Region, and Japan and Spain are also important in certain countries. The UN and the Organization of American States (OAS) are involved in disaster-related activities, generally in the form of providing policy advice and international advocacy in the wake of a disaster. For example, the OAS has a unit called the Inter-American Emergency Aid Fund whose role is not to provide resources, but advocate for resources on behalf of countries in need. The Global Facility for Disaster Reduction and Recovery (GFDRR) and the United Nations Office for Disaster Risk Reduction (UNISDR) both lead global analytical efforts in DRM and seek to support governments’ risk reduction.

International humanitarian agencies like Doctors without Borders, CARE, the International Rescue Committee (IRC), and Oxfam all play important roles in humanitarian relief, but the Red Cross is the most prominent agency in the Region. Each of these agencies plays a specialized role: Doctors Without Borders concentrates on health, the IRC focuses on displaced people and refugees, Oxfam has a comparative advantage in helping restore basic services, and the International Red Cross specializes in providing immediate relief. In fact, governments themselves often rely on the Red Cross to provide these services in place of government agencies, which act more as first responders and coordinators of the various institutions working in the Region. Each of these agencies provides disaster relief in some capacity, and there is certainly overlap.

The private sector plays a very limited role in DRM. Most risk reduction in the private sector takes place internally; each company assesses its own risk and plans investments accordingly. For example, private enterprise is more likely to invest in an area that already possesses disaster-resistant infrastructure than to lobby, or assist, the government to develop this infrastructure. Unlike the private energy sector, which consistently works with governments and the multilateral development banks in investing in profitable energy production, there is no private disaster risk reduction sector and no major collaboration in this area.

- 2.9 **In recent years, the IDB approved some innovative initiatives to better integrate DRM and CCA, although it has not been reflected in specific guidelines or strategic documents.** The Bank has developed a system of indicators for DRM to assist in integrating DRM into the Bank’s country programming, as well as project preparation, monitoring and evaluation

exercises.⁹ This set of indicators is also expected to be used for policy decision-making to governments in the Region. Some of the indicators (as the newest Index of Governance and Public Policy –iGOPP–) incorporate CC in the analysis framework, based in the IPCC SREX’s model (IPCC, 2013b). The Emerging and Sustainable Cities Initiative, launched in 2011, includes assessment of cities performance on climate change and disaster risk planning. It also provides the partner cities (40 between 2011 and 2014) with studies to assess vulnerability and to help reduce emissions. Other projects, as the Strengthening of capacities for the integrated management of disaster risk in Guatemala (ATN/OC-12499-GU) published in 2012, have incorporated CC scenarios to estimate risk of natural disasters at a national level. The implementation of recommendations emerged from these studies is still a challenge and depends on financial resources, institutional capacity and prioritization of actions within the government’s agendas.

B. Country Strategies and DRM

- 2.10 **To understand how the DRM Strategy has been applied at the country level, OVE analyzed 10 IDB country strategies**—those of Brazil, Colombia, Ecuador, Haiti, Jamaica, Mexico, Nicaragua, Panama, Paraguay, and Peru. The countries selected represent a mix of LAC regions with common challenges but specific institutional contexts (technical capacity, fiduciary resources, human resources, etc.), and their portfolios contain a diverse set of projects (investment and policy-based loans, TCs, emergency loans, etc.). The strategies, all approved after the definition of the policy in 2007 and the guidelines in 2008, were analyzed to ascertain how important DRM was in each one (e.g., was disaster reduction considered a priority?) and how relevant these DRM priorities are to climate change (e.g., were they linked?). (Annex E provides a detailed analysis of each strategy.)
- 2.11 **The country strategies consistently include natural disasters, either as a pillar or main objective to manage the risk or occurrence of disaster risk, or, more commonly, as a factor that could place the implementation of the strategy at risk.** In some country strategies—Ecuador, Jamaica and Peru—the area is of the highest importance; in others—Panama and Paraguay—it is barely mentioned.
- 2.12 **Occasionally, country strategies consider disasters and CC together, but the relationship is not articulated.** Still, it is generally common for both themes to be mentioned in the strategies, but with no relationship between the two. When disasters are mentioned there is no acknowledgment of the role that climate change may play in exacerbating their frequency or magnitude, and no scientific data are ever used to establish the potential of this risk. In only one of the

⁹ The set of indicators are the Disaster Deficit Index (DDI), the Local Disaster Index (LDI), the Prevalent Vulnerability Index (PVI), the Risk Management Index (RMI) and the Governance and Public Policy Index (iGOPP).

10 strategies (Jamaica) CCA and DRM were described as similar or parallel efforts.

- 2.13 **In general, DRM priorities identified in country strategies are generally aligned with the countries' disaster risk levels.** As a proxy for relevance, OVE analyzed whether the 10 country strategies give sufficient importance to climate-related DRM (rated as low, medium, or high) as compared with the country's level of risk (low, medium, or high risk) according to the World Risk Index (WRI).¹⁰ The strategies of five countries – Colombia, Ecuador, Jamaica, Mexico, and Paraguay – give DRM a level of importance that reflects the severity of their climate-related disaster risk situations. For Ecuador and Jamaica, countries with high climate-related disaster risk, the strategies make DRM a high priority. For Paraguay, a country with low climate-related disaster risk, the strategy gives low importance to DRM. In Mexico and Colombia the frequency of dangerous natural hazards is high, but these countries also have the resources and human and institutional capacity to manage these risks; as a result, their relative need for support from the IDB in DRM is lower, and their country strategies reflect this. Of the remaining five country strategies, two – Brazil and Peru – give greater importance to DRM than their risk of climate-related disasters would warrant. However, the strategies for three countries – Haiti, Nicaragua and Panama – seem not to give great enough priority to DRM.

III. IDB'S DRM PORTFOLIO

A. DRM portfolio description

- 3.1 **DRM financing represents 1% of total IDB lending** (excluding contingency loans).¹¹ From 2004 to 2013 the IDB lent US\$976.3 million for DRM projects (see Table 1). These projects fall under either the disaster risk management subsector (PA/DRM) or other subsectors¹² like environment or water and sanitation.

¹⁰ The WRI (UNU-EHS, 2012) measures a country's vulnerability to disaster risk by taking into account exposure to natural hazards, the susceptibility of suffering harm, coping capacity, and long-term adaptive capacity (see Annex E).

¹¹ OVE has omitted contingency loans from the portfolio analysis since they are used only when there is a major disaster. Furthermore, the approved amounts for this loan type are typically much larger than those for most operations, so they could skew the analysis.

¹² For the DRM evaluation portfolio, OVE defined two types of projects. The first group contained projects with main objectives (general or specific) directly linked to DRM activities, with explicit or implicit links to climate change; some of these projects are under the PA/DRM subsector as defined by the IDB and the rest are under other sectors/subsectors. The second group contained projects whose main objective is not DRM but that have some activities related to DRM (DRM-related projects). During the period analyzed the IDB approved 168 DRM-related operations worth US\$5.36 billion. Of the DRM-related portfolio, 43% is in the environment sector and 35% is in the water and sanitation sector. Much of the DRM-related portfolio also contains infrastructure activities (e.g., flood prevention). More than 50% of the total DRM-related portfolio was approved during the three years from 2009 to 2011.

Table 1. DRM portfolio, 2004-2013

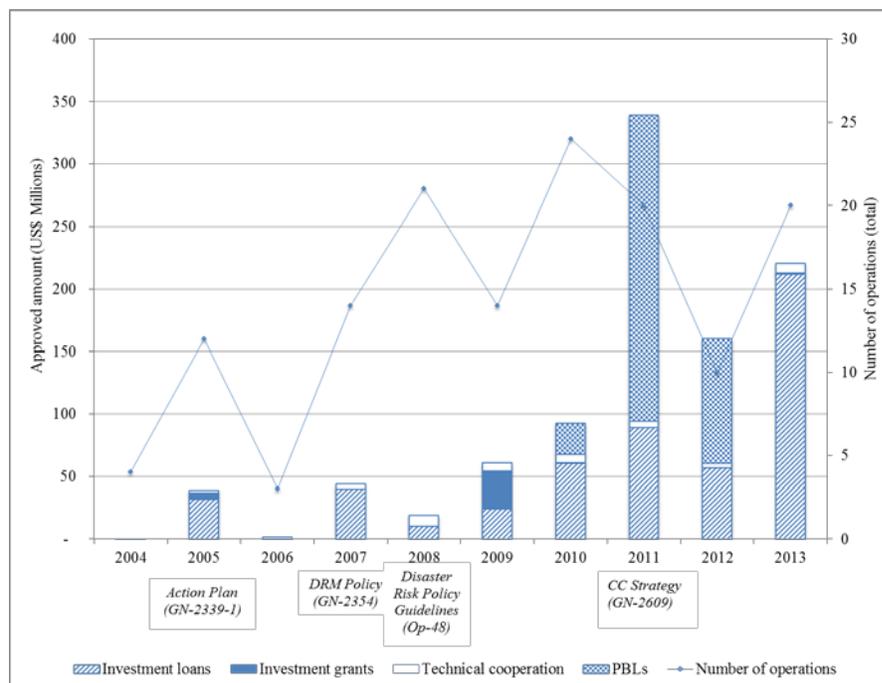
Type of instrument	Number of operations	Original approved amount (US\$ million)
Investment loans	20	523.1
Investment grants	4	36.7
Technical cooperation	113	46.6
PBLs	5	370.0
Total	142	976.3

Source: OVE using OVE/OVEDA

3.2 DRM lending has increased since 2010, when the CC Strategy was approved.

As Figure 4 shows, policy-based loans (PBLs) are the biggest reason for this increase, though even when excluding PBLs there was a slight increase during the 2009-2012 (about US\$60 million annually) and a significant increase in 2013 (US\$220 million). The increase in 2013 was mainly because of the approval of a number of investment loans, which represent 96% of the total approved amount for that year.¹³ For TCs, including TCs approved for emergency assistance, the approved amount increased after the approval of the DRM Policy Guidelines in 2007, but decreased steadily until 2013, when it spiked again to US\$8 million (Figure 5).

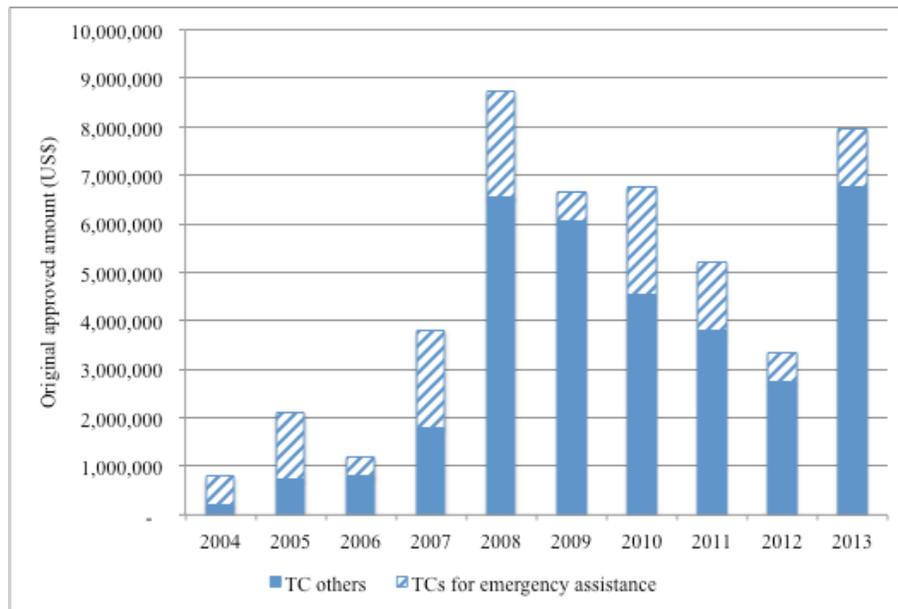
Figure 4. Evolution of the DRM portfolio



Source: OVE using OVE/OVEDA

¹³ One project was the biggest contributor to the increase in investment lending – a US\$120 million loan for flood prevention in Trinidad and Tobago (TT-L1036 Flood Alleviation and Drainage Program).

Figure 5. Evolution of DRM TCs



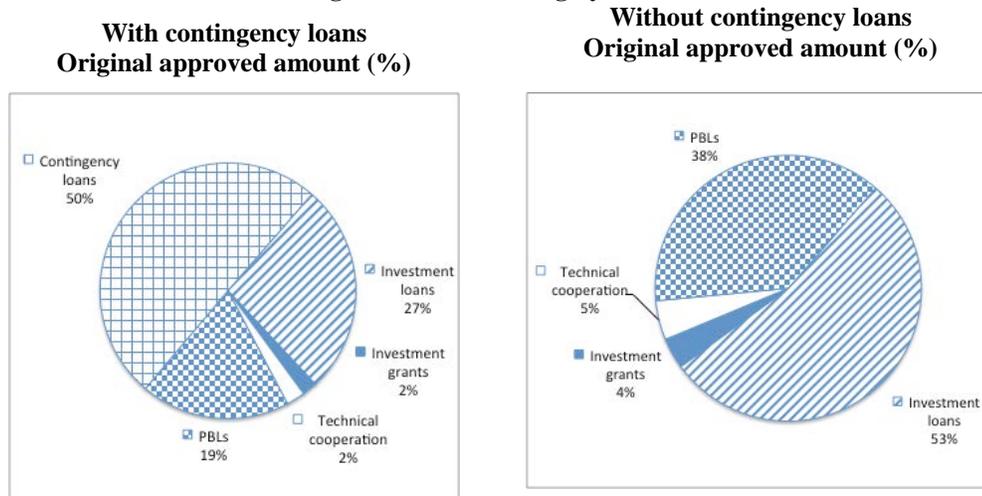
Source: OVE using OVE/OVEDA

3.3 **The most used instrument for addressing DRM was TC, although the amount approved only represented 5% of the total approved amount during the period.** Of the total DRM portfolio of 142 operations, 113 are TCs, of which almost half were approved to respond to emergency events.¹⁴ The IDB has also approved 20 investment loans (8 for specific emergency events), 4 investment grants, and 5 PBLs. Investment loans and PBLs make up the majority of spending (53% and 38% respectively).¹⁵ Between 2008 and 2013 the IDB also approved 7 contingency loans for emergencies, with an original approved amount of US\$986 million (Figure 6). These contingency loans were designed as a form of insurance for countries that would not usually qualify for it on the open market—insurance that they could use in the event of a major disaster. To date, no contingency funds have ever been disbursed. Governments and some IDB specialists have reported that the triggers for disbursing contingency operations are seen as too rigid and difficult to achieve, and in some cases, neither the country nor the Bank has appropriate instruments to measure the defined conditionalities.

¹⁴ Most of the TC for emergency assistance and response to damage were funded through the Emergency Fund, US\$1 million per year).

¹⁵ Including contingency loans, investment loans make up 27% of the total approved amount and PBLs 19%.

Figure 6. DRM lending by instrument

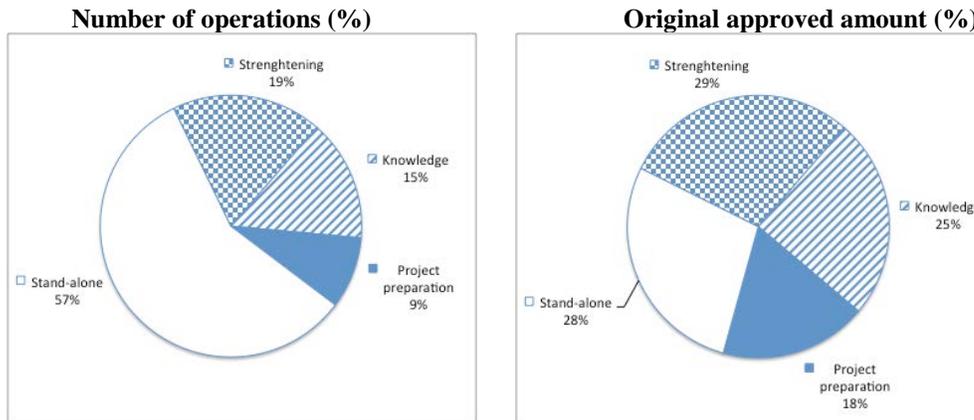


Source: OVE using OVE/OVEDA

3.4 **In approved amounts, TCs are equally distributed among knowledge generation activities, institutional strengthening, project preparation, and stand-alone projects** (Figure 7).¹⁶ Stand-alone TCs are almost all related to operations for emergency assistance and support programs for response to damage (63 out of 65). TCs for project preparation have the largest average amount (US\$850,500), and knowledge and strengthening TCs the next largest (US\$650,000). TCs for institution strengthening and project preparation became more prominent after the approval of the DRM Policy Guidelines in 2008. This could reflect an intentional shift or a natural movement that mirrors the emergence of PBLs as a lending tool.

¹⁶ OVE has defined 4 categories of TCs to analyze the CC Evaluation portfolio, including the DRM portfolio: **Knowledge generation** TCs refer to projects focused mainly on studies and information dissemination related to CC; **institutional strengthening** TCs refer to projects seeking to create or improve institutional and technical capacity through training, seminars, etc.; **project preparation** projects are for the elaboration of future investment programs (loans or grants) and PBLs/PBPs and include pre-investment studies, data collection, etc.; **stand-alone** projects are normally small investment TCs and pilot projects with defined objectives and components, as an independent operation.

Figure 7. TC Analysis



Source: OVE using OVE/OVEDA

3.5 **A deeper examination of DRM TCs shows that they were used to complement loans and supplement limited government capacity.** Specifically, 90% of funding for TCs has been used to support risk assessment (41%) and preparedness measures (49%) and 10% for prevention (see Box 3 for definitions). TCs are used to help IDB and government specialists design loans with better information and data. They also provide sorely needed information to government agencies tasked with managing projects.

Box 3. DRM stages

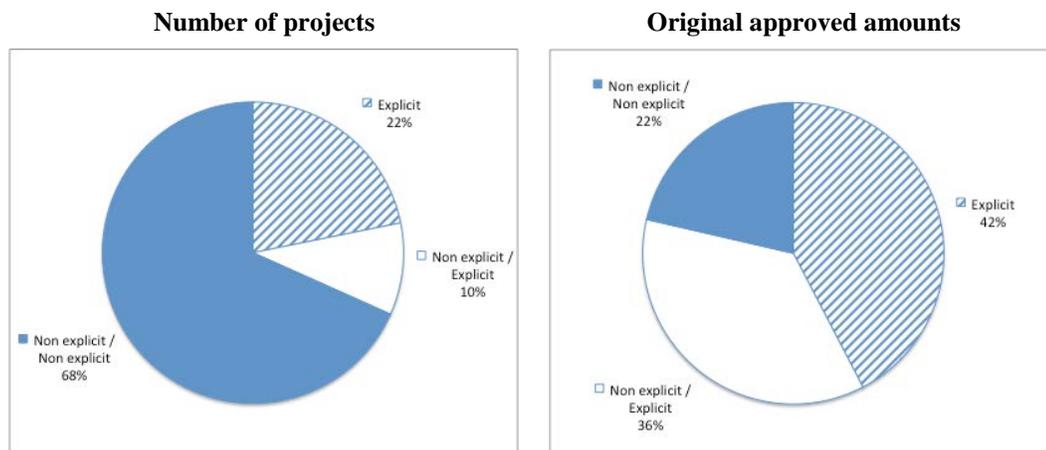
The evaluation framework defines the DRM cycle as having six stages based on the focus areas defined in the IDB Action Plan (see Section 3) and the DRM literature:

- **Risk assessment:** the analysis of potential hazards and the evaluation of conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods, and the environment on which they depend (e.g., analysis, studies, data).
- **Prevention:** actions to ensure that human actions or natural phenomena do not result in disaster or emergency. This includes from reforms of institution policies that lead to greater prevention –for example land-use regulations that do not permit any settlement in high-risk zones- to infrastructure construction—for example, dams or embankments that eliminate flood risks..
- **Preparedness:** all the measures that can ensure an effective response. This includes contingency planning; stockpiling equipment and supplies, developing arrangements for coordination, evacuation, and public information; and associated training and field exercises (e.g., institutional capacity, plans).
- **Response:** all activities that can address an emergency (relief and humanitarian assistance, public safety, basic subsistence needs, etc.).
- **Rehabilitation:** actions that restore basic functions (rebuilding basic services such as electricity and water, etc.).
- **Reconstruction:** actions that restore full resumption.

B. DRM and climate change

3.6 **Although DRM accounts for only 4% of all climate-related financing, it represents 16% of all IDB adaptation funding.**¹⁷ Yet the majority of DRM projects—97 (68%)—do not mention climate change in their approval documents (Figure 8, left). Even though according to the IPCC SREX (IPCC, 2013b) all projects in DRM have adaptation objectives, just 31 operations out of 142 (22%) have objectives explicitly related to climate change (mostly approved after 2011 when the CC Strategy was approved); and 11 include CC issues in the project document diagnosis as a component or indicator. Figure 8 (right) shows that DRM projects with explicit CC objectives account for 42% of the total original approved amount. This is actually higher than the CC-related portfolio, in which only 5% of projects and 20% of project financing have explicit CC objectives.

Figure 8. Percentage of projects with explicit CC objectives in project documents



Source: OVE using OVE/OVEDA

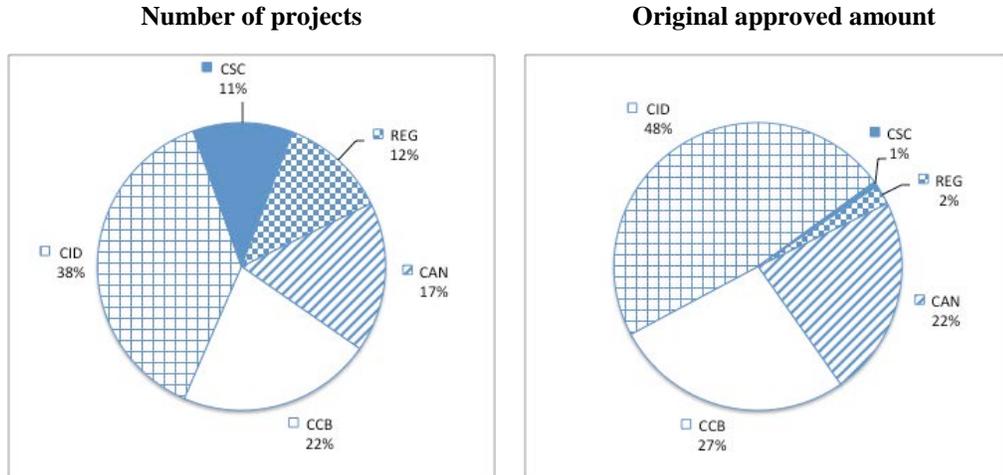
3.7 **The countries that lie on the Caribbean hurricane belt—including the Central America and Mexico region (CID) —receive the most financing from the IDB for DRM programs.**¹⁸ The second most important region in terms of total funding is the Caribbean region (CCB), followed by the Andean region (CAN) (Figures 9 and 10). This prioritization lines up nicely with the WRI's vulnerability map (Annex F), which shows these regions as the most prone to disaster risk in the LAC. By country, Panama has received the most lending over the evaluation period because of a US\$200 million PBL. Nicaragua and Colombia received the second most lending, also mostly because of PBLs. Without taking

¹⁷ The DRM portfolio for this evaluation includes projects with an original approved for over US\$150,000. Projects related with seismic or volcanic risk are not included.

¹⁸ The IDB defines four regions: CAN (Country Department Andean Group: Bolivia, Colombia, Ecuador, Peru, Venezuela); CID (Country Department Central America, Mexico, Panama and the Dominican Republic: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Mexico, Panama, Dominican Republic); CSC (Country Department Southern Cone: Argentina, Brazil, Chile, Paraguay, Uruguay); and CCB (Country Department Caribbean Group: Bahamas, Barbados, Guyana, Jamaica, Suriname, Trinidad and Tobago).

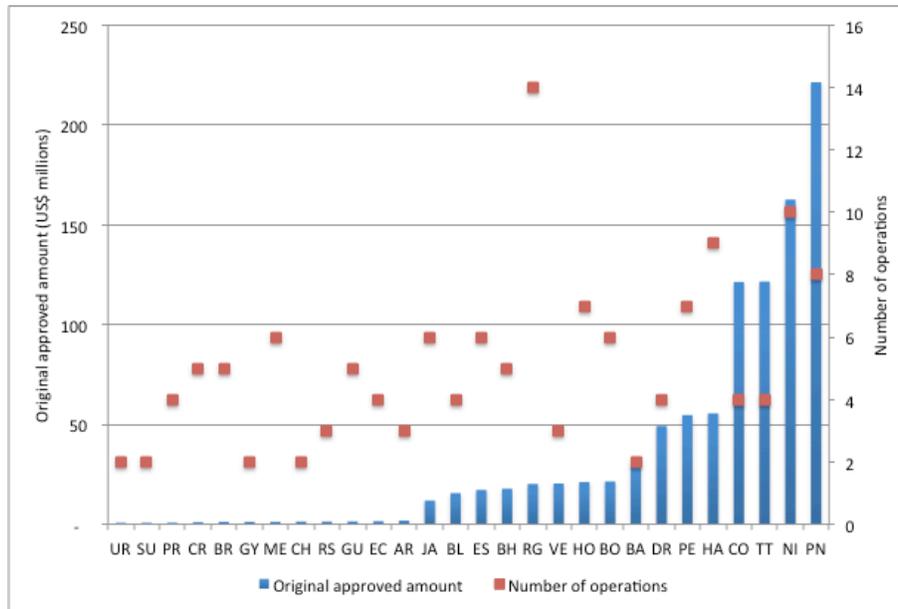
PBLs into account, Trinidad and Tobago had the most lending, with US\$121.6 million. In addition, 14 operations and 13 TCs were approved at a regional level.¹⁹

Figure 9. Lending by region



Source: OVE using OVE/OVEDA

Figure 10. DRM portfolio by type: country and regional



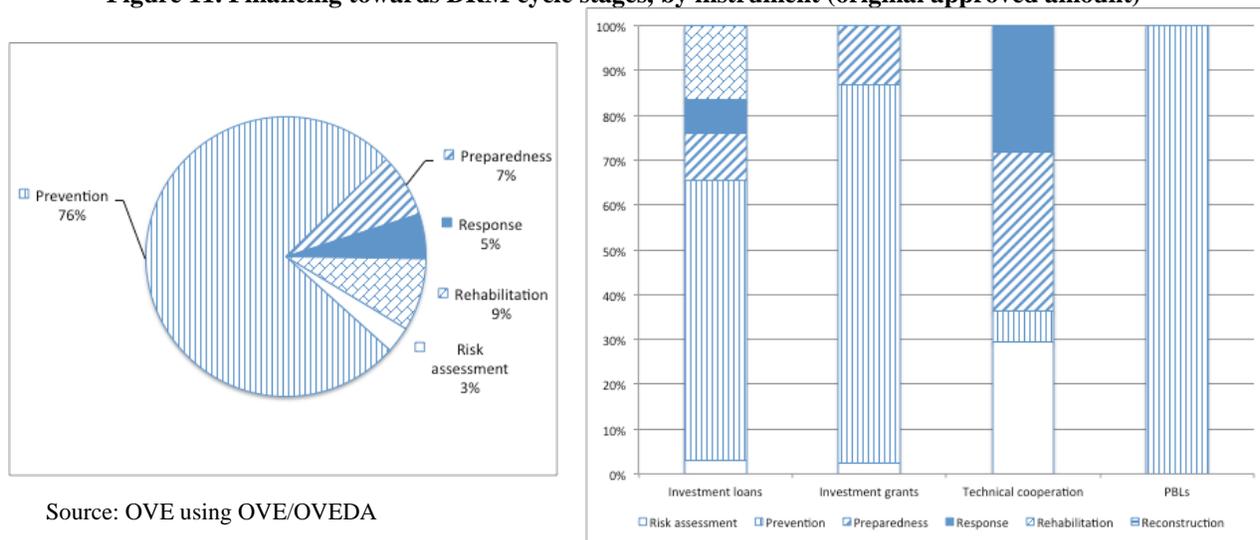
Note: AR: Argentina, BA: Barbados, BH: Bahamas, BL: Belize, BO: Bolivia, BR: Brazil, CH: Chile, CO: Colombia, CR: Costa Rica, DR: Dominican Republic, EC: Ecuador, ES: El Salvador, GU: Guatemala, GY: Guyana, HA: Haiti, HO: Honduras, JA: Jamaica, ME: Mexico, NI: Nicaragua, PE: Peru, PN: Panama, PR: Paraguay, RG: Regional, SU: Suriname, TT: Trinidad and Tobago, UR: Uruguay, VE: Venezuela.

Source: OVE using OVE/OVEDA

¹⁹ A US\$10 million emergency loan was provided to Grenada (RG-L1006 Grenada Reconstruction, Recovery and Development Program) through the Caribbean Development Bank

- 3.8 **The majority of IDB financing for DRM is for prevention measures (Figure 11 and Box 3), which are mainly included in the PBLs that support institutional reforms.**²⁰ Nearly 21% of total funding is used to deal with disasters (preparedness, response, and rehabilitation).²¹ Preparedness accounts for 7% of the total DRM portfolio (US\$69.3 million).²² Figure 12 shows that since 2010 there has been a shift toward prevention, with the approval of 5 PBLs, shifting from a traditional focus on preparedness and response –not only within the Bank but also in countries’ legal frameworks. Nonetheless, the complexity and limited structural depth of conditionalities defined in PBLs could limit the impact of the instrument to support institutional and policy changes. Funding dedicated to ex-ante disaster management (prevention and preparedness) alone represents more than 83% of the IDB’s DRM financing. This makes the IDB highly relevant to governments in carrying out pre-disaster measures, although the IDB’s activity in risk assessment has been very limited (see Figure 12).
- 3.9 **IDB addressed countries’ DRM demands using all financial and non-financial instruments.** For example, investment loans, PBLs and grants were largely used to support disaster prevention; TCs to support preparedness and risk assessment; contingency loans and emergency TCs to support response; and emergency loans largely to support rehabilitation.

Figure 11. Financing towards DRM cycle stages, by instrument (original approved amount)

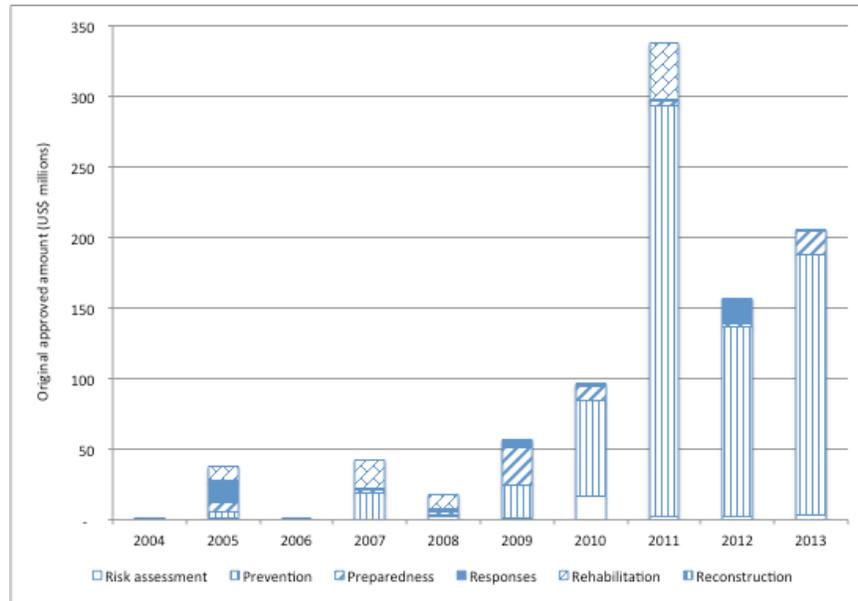


²⁰ It should be noted that PBLs could contribute to each of the stages of the DRM framework over the long term (institutional and policy reforms could help also to prepare countries for disasters; some studies linked with conditionalities are focused on risk assessment).

²¹ The IDB has not approved any project under the reconstruction stage during the period of analysis.

²² Prevention and preparedness totals might be underestimated since urban development, water or natural resource management, climate change adaptation, and agricultural development can all help prevent the risk of disasters but might not be classified as disaster-related.

Figure 12. Evolution of financing towards DRM cycle stages



Source: OVE using OVE/OVEDA

IV. PORTFOLIO ANALYSIS

- 4.1 To gain a better understanding of the successes and shortcomings of the IDB’s portfolio of DRM projects, the study team carried out an in-depth analysis of 13 illustrative projects in seven countries (Table 2).²³ For the analysis, the team reviewed project documents (project proposal, project monitoring and completion reports, midterm and final evaluations, etc.) and conducted several interviews with IDB project team members and their government partners.²⁴ The analysis of the selected projects is based on the 6-stage DRM evaluative framework (risk assessment, prevention, preparedness, response, rehabilitation and reconstruction). It focuses on seven dimensions: (i) the relevance of each DRM project to climate change, (ii) the quality of the results framework, (iii) the success of implementation, (iv) the overall effectiveness of the project (for completed or highly disbursed projects), (v) the level of innovation, (vi) the IDB’s additionality (how much the IDB contributed to the execution and ultimate success of each project), and (vii) the project’s sustainability (for completed or highly disbursed projects).

²³ These projects were selected as illustrative examples of the DRM portfolio in all sub-regions in LAC, representing a variety of lending instruments.

²⁴ The evaluation team visited Brazil, Haiti, Nicaragua, Panama, and Peru and interviewed counterparts and IDB specialists in the country offices.

Table 2. DRM projects

Number	Project	Country	Operation type	Year	Original approved amount (US\$)	% disb.
BR-L1241	Serra do Mar and Atlantic Forest Mosaic System Socio Environmental Recovery ^a	Brazil	INV Loan	2010	162,454,000	32%
CO-L1103	PBP-Disaster Risk Management and Climate Change Adaptation Program	Colombia	PBL	2011	120,000,000	100%
HA-L1005	National Program of Flood Early Warning	Haiti	INV grant	2005	5,000,000	100%
HA-L1041	Natural Disaster Mitigation Program in Priority Watersheds I	Haiti	INV grant	2009	30,000,000	41%
HA-L1086	Emergency Road Rehabilitation Program in Response to Hurricane Sandy	Haiti	Emer Loan	2012	17,500,000	29%
JA-L1015	Emergency Assistance in Response to Flood Damage	Jamaica	Emer Loan	2008	10,000,000	100%
NI-L1048	Environmental Program for Disaster Risk and Climate Change Management	Nicaragua	INV Loans	2010	10,000,000	57%
PN-L1070	Program to Reduce Vulnerability to Natural Disasters and Climate Change I	Panama	PBL	2011	100,000,000	100%
PN-L1071	Emergency Program for an Immediate Response to the Flooding in Panama	Panama	Emer Loan	2011	20,000,000	100%
PN-L1074	Program to Reduce Vulnerability to Natural Disasters and Climate Change II	Panama	PBL	2012	100,000,000	100%
PE-L1086	Program to Reduce Vulnerability to Disasters I	Peru	PBL	2010	25,000,000	100%
PE-L1104	Program to Reduce the Vulnerability of the State II	Peru	PBL	2011	25,000,000	100%
RG-L1006	Grenada Recovery and Development Program	Regional	Emer Loan	2005	10,000,000	100%

^a This project was designed as an environmental conservation program but became more concerned with DRM during implementation; thus it is included in the DRM-related portfolio.

Source: OVE using OVE/OVEDA

4.2 **Like the whole DRM portfolio, the illustrative projects are also concentrated in prevention.** Nine are prevention projects (CO-L1103, HA-L1005, HA-L1041, BR-L1241, NI-L1048, PN-L1070, PN-L1074, PE-L1086, PE-L1104); there are also three response projects (HA-L1086, JA-L1015, PN-L1071) and one rehabilitation project (RG-L1006). Risk assessments are mainly financed through TCs, and no reconstruction project was approved during the period of analysis. It is important to underline that most of the projects, whatever the stage they focus on, include analysis and/or studies of existing conditions of vulnerability to support the preparation of other activities in the program. However, very few evaluative tools are available to measure the quality of the assessments and their effectiveness.

- 4.3 **In general, results frameworks are vague, so it is difficult to ascertain project effectiveness.** Project results frameworks vaguely define project outcomes, and there are no long-term evaluation tools to measure their achievement.²⁵ Project Completion Reports (PCRs) and Project Monitoring Reports (PMRs) have helpful sections that analyze project risks and lessons learned, but lack any insight into the long-term impacts from policy reforms or investment activities. In some cases (BR-L1041, HA-L1005), PMRs do not reflect the indicators originally defined in the loan document. In others, indicators lack baselines and/or targets.²⁶ Furthermore, even if there are indicators with baseline and target, the PMRs do not contain information about the partial achievement of results, or the information is incomplete (JA-L1015, NI-L1048).²⁷
- 4.4 **From design to implementation, projects generally demonstrate a weak stated link between DRM and CC, undermining the relevance of the portfolio regarding explicit climate adaptation measures and impacts.** This could be because there are insufficient data related to climate change to use in assessing disaster’s risks. As a result, governments tend to stay focused on traditional risk management issues (civil protection and disaster response) rather than deal with the implications of climate change and climate variability on DRM. Therefore, the analysis is focused more on DRM effectiveness than on CCA.
- 4.5 **In terms of the effectiveness of the TCs, very few evaluative tools are available to measure it, and the results are not clear.** Interviews with IDB specialists suggest that TCs have helped not only to better prepare loans, but also to build knowledge within countries and keep an active relationship with counterparts. However, OVE found difficult to gauge their relative successes or shortcomings with much confidence, especially across the entire DRM portfolio.

A. Results on prevention

- 4.6 **Prevention has been mainly financed through PBLs supporting governments’ institutional reforms.** It is clear that one of the priorities of the IDB’s DRM portfolio is to support governments’ institutional reforms through PBLs (CO-L1103, PN-L1070, PN-L1074, PE-L1086, PE-L1104). PBLs for DRM amount to US\$370 million in lending from 2010 to 2012—nearly 40% of total DRM lending for the 10 years from 2004 to 2013. It is also clear that the IDB is capable of executing these loans.

²⁵ The IDB has two main tools to evaluate projects: the Progress Monitoring Report (PMR) and Project Completion Report (PCR). The PMR is for investment projects still under implementation. PCRs simply describe whether or not the project activities of the loan were completed.

²⁶ In BR-L1041, 50% of the 8 new indicators have a baseline and 60% have targets. In NI-L1048 almost all the indicators do not present a baseline (the baseline would be collected during the first months of the implementation), but there are targets defined as “increasing XX” with percentage and with exact numbers (even without a baseline).

²⁷ Projects approved in recent years show an improvement in the definition of the results matrix as well as better indicators to measure the results of the implementation of the DRM policy.

- 4.7 **In terms of design, PBLs exhibited long and complex policy matrixes with a large number of conditionalities which were and often weak in terms of policy reforms.**²⁸ The evaluation reviewed in depth the PBLs approved in Colombia (CO-L1103) and Panama (PN-L1070, PN-L1074). The PBL policy matrixes were more focused on strengthening institutional arrangements and knowledge than on policy reforms. From the 30 commitments identified in the original policy matrixes, 23% were policy reforms and more than 25% of them were policy reforms with little structural depth. Furthermore, the PBL in Panama changed 11 programmatic commitments during implementation (decreasing the structural depth in 10 of the cases), dropped 22 and add 14 new ones. This situation reflects the flexibility of the instrument, but it may also question the long-term distinctive feature of the instrument and, consequently, decrease the impact of the program in relation with the prevention goals.
- 4.8 **In general, DRM PBLs executed satisfactorily, overcoming coordination failures.** The conditionalities for PBLs are already met or in the process of being met before project approval—a fact that simplifies the implementation of the programs. However, some problems of coordination between government agencies and between levels of government have been noticed (PN-L1070, PN-L1074) (similar coordination problems arise in investment loans linked with this type of programs). DRM prevention activities often cut across many ministries—for example, environment, urban development, or transportation—that normally work in their own silos and are unaccustomed to the need for inter-ministerial coordination. PBLs were mainly focus at the national level, with little attention to DRM and CC policies and normative frameworks at the subnational levels.
- 4.9 **The sustainability of the reforms and programs supported by PBLs depends on institutional capacity and government financial support.** In Colombia, the Government carried out reforms successfully, largely because of the high technical capacity of the country officials and the smooth coordination among institutions. This context guarantees high sustainability in the medium and long term. The country has capable institutions and highly trained human resources to manage programs to reduce the impact of natural disasters through both prevention and emergency response. It has also funded an Adaptation Plan as part of the General Budget. Furthermore, the institutions that manage the Adaptation Plan and other main action lines/plans are directly related to the Office of the Presidency, giving them more power to take decisions and execute at a high level.

²⁸

Commitments were rated according to the degree of depth of the change they propose: (i) Little: includes conditions that would not, by themselves, bring about any meaningful economic changes although they may serve as stepping stones for significant reforms; (ii) Limited: conditions calling for one-off measures that can be expected to have an immediate and possibly significant effect, but that would need to be followed by other measures in order for this effect to be lasting; and (iii) High: conditions that, by themselves, would bring about long-lasting changes in the institutional environment. Most of the conditions in this category entail legislative changes. This category also includes conditions requiring that certain fiduciary measures be taken on a regular and/or permanent basis, even when legislation is not needed (often these measures are implemented through regulation).

By contrast, Panama lacks sufficient institutional capacity to manage the new legislation (national risk plan, action plans, etc.), and there is still a need for greater coordination between institutions and greater budgetary commitment from the Government to cover the actions associated with prevention. Although the country fulfilled the condition of approval of specific budget lines for prevention topics, funding for prevention issues remains a major constraint reported by both the IDB and several institutions in the country (Box 5 describes the experience with a PBL in Peru.)

Box 5. Institutional strengthening in Peru

Peru is the first of several countries to which the IDB has provided a disaster-related PBL. The first two tranches of the three-tranche Program to Reduce Vulnerability to Disasters (US\$75 million) were approved and disbursed. The final tranche has been approved but, at the Government's request, has not yet been disbursed (expected for 2014). Under the first operation, the IDB supported the Government's process of regulatory, institutional, and public policy reform in the areas of risk identification, vulnerability reduction, disaster management, and financial management of natural disaster risk. The second operation supported the drafting of Peru's National Disaster Risk Management System and culminated in the enactment of a national law on disaster risk management. The third operation aimed to further reduce vulnerability.

The passing of Law 29664, which establishes a National System of Disaster Risk Management (SINAGERD), was by far the most important – and contentious – achievement of the PBL, and for that matter of the entire IDB involvement in DRM in Peru. The IDB played a key role in both the drafting and passing of this law. The goal of SINAGERD was to create a more integrated system of disaster risk management by establishing new objectives, policy guidelines, components, processes, and tools to reduce disaster risk. It establishes protocols not just to respond to disasters, but also to prepare for and recover from them. It requires public entities to have in place both DRM plans and the funds to carry them out. It established a number of studies and institutions to develop a knowledge base related to DRM. The new system also includes important mechanisms for self-correction, budgeting, and transparency. The law applies to all levels of Peru's Government, from the national to the local level. The IDB had a key role in designing a major component of SINAGERD—the institutional reforms associated with the new law.

Before the adoption of the new law, the National Institute of Civil Defense (*Instituto Nacional de Defensa Civil – INDECI*) was the only entity responsible for disaster risk management in Peru. The IDB's strategy behind the institutional reforms of Law 29664 was to bring DRM as an issue closer to the presidency and diversify the types of public agencies responsible for it. Under the law, INDECI remains in charge of much of the response area, but a new institute, the National Center of Disaster Risk Forecasting, Prevention and Reduction (*Estimación, Prevención y Reducción del Riesgo de Desastres - CENEPRED*) is responsible for much of the disaster planning. Coordination and communication between INDECI and CENEPRED are still weak.

The reforms have now been in place for two years, but there are still some challenges for their broad implementation. SINAGERD has not clarified its roles and the agencies claim that there is little constructive dialogue and coordination between them. Another more practical problem associated with the institutional reforms is that local application of the law has been limited. Local governments have not understood how national reforms affect them. The capacity to implement is also limited—partially by the low capacity of local partners to apply reforms, but also by the lack of clarity at the federal level as to what reforms mean locally.

4.10 Investment loans are usually geared toward the prevention of disasters, and the analysis suggests that the IDB adds value through technical assistance

and innovative designs. In the Serra do Mar Program (BR-L1241), for example, the IDB and the Government of São Paulo introduced the tile system as a management policy to manage conservation areas. The project included studies in risk-prone areas and the development of infrastructure and economic activities in a new DRM framework. During design and implementation, the Bank added value in the social safeguards area (resettlement; see Box 4), in the coordination of various administrative departments in the state of São Paulo, and in efforts to improve interoffice management. In Haiti, too, the project designs were innovative, introducing the topic of flooding management in watershed programs (HA-L1005) and later integrating DRM into agriculture programs (HA-L1041). However, these projects did not take into account the fragile social, economic, and institutional context, and the implementation of the activities has not been very successful. For the program in Nicaragua (NI-L1048), the IDB added value in the design and implementation of the project, promoting changes in the current strategy and in the approach of the Ministry of Natural Resources to DRM.

4.11 **The effectiveness of preparedness projects has been hindered by the low institutional, technical, or financial capacity of the implementing agencies.**

- Haiti's low institutional capacity limited the effectiveness of the National Program of Flood Early Warning (HA-L1005). The project, approved in 2005, closed in 2013 and was partially cancelled.²⁹ The objective was to build the country's capacity to identify and better prepare for flood risk, with special emphasis on reducing the loss of lives. Several problems affected program implementation: lack of institutional capacity to collect and manage data, cost overruns, lack of data to design the components, unrealistic targets, lack of financing to maintain the hydrometeor stations, and weak coordination among different actors in the sector. There were efforts to strengthen the country's institutional capacity (component 4), but the activities were focused more on infrastructure and materials than institutional strengthening. The institutional handover to national entities is still pending.
- In Nicaragua, the DRM investment loan (NI-L1048) aimed to reduce the vulnerability of rural populations to events associated with climate change through risk management actions based on conservation of natural resources in vulnerable prioritized watersheds.³⁰ The project has disbursed less than 60% of the total approved amount. But some municipalities seem not to have the technical or financial capacities to maintain the infrastructure built through the project. Moreover, interviews suggested that the budget for disaster management is used for emergencies, and there is no financial plan or disaster risk fund to support project activities in the future.

²⁹ The final approved amount was US\$4,534,522 (9% less than the original approved amount). The amount for component 1 was increased 54%, and components 3 and 5 were cancelled. The IDB approved two TCs (2009 and 2011) to complete the activities that were not finished with this investment grant.

³⁰ The main problems for the implementation of the program were related to difficulties in hiring consulting firms, but they have been solved and the progress of the program is satisfactory

- The Program on Natural Disaster Mitigation in Priority Watersheds in Haiti (HA-L1041) aims at reducing long-term vulnerability to natural hazards for 360,000 inhabitants from the 162,500 hectares of the three watersheds selected. The project was approved in 2009, but implementation did not begin until 2011 because of delays in the watershed management plan, lack of staff in the Ministry of Agriculture, change of priorities after the 2010 earthquake, and several changes in the executing agency. While the disbursement of the operation is not yet sufficient (37%) to evaluate the effectiveness and sustainability of the program, some evidence suggests that both will be difficult to achieve. Risk factors include the lack of resources to complete the works originally proposed, the weakness of grassroots organizations, the lack of incentives for farmers to participate in project activities, and the lack of clarity on the responsibilities for maintenance.

Box 4. Brazil and DRM at the subnational level

In Brazil, the IDB played an important role in reducing disaster risk at the subnational level through the Serra do Mar project. The overall objective of the loan is to promote the conservation, sustainable use, and socioenvironmental recovery of the Serra do Mar in São Paulo, generating social and environmental benefits by protecting biodiversity and the springs that feed the São Paulo metro area and the Santos lowlands.

When this loan was designed, the motivation was purely environmental; however, it became obvious that a component was needed to resettle families that are located in protected areas or areas of high disaster risk. The resettlement component represents US\$341 million (73%) of the US\$470 million total project cost. Initially, the resettlement component was designed to remove families who lived in designated protected areas, but it evolved to include more of a risk management objective. It involves the construction of new housing and communities, with related social services, for the resettled families. The plan was to resettle nearly 7,000 families (both voluntarily and non-voluntarily). So far 4,000 families have been moved—all voluntarily.

The IDB helped design this program, under which thousands of families voluntarily resettled in areas that were not at risk of disaster or degradation. Project managers navigated various social and environmental challenges to produce tangible benefits, working at the subnational level, which is a priority area.

B. Results on response to disasters

- 4.12 **In general, the design of response programs is weak, as the emergency prevents deep diagnosis analysis.** Emergency response loans are designed to support countries' rehabilitation from disaster. While the short design phase is good for quickly mobilizing funds, it leaves less time to accurately judge all of the challenges, constraints, and hidden costs of the project. Sometimes the project activities are not clearly or explicitly linked to the desired outcomes (JA-L1015). This can affect the implementation of the programs (HA-L1086, PN-L1071), although results are usually satisfactory.
- 4.13 **The Bank adds value in terms of quick response to an emergency, as the operations are effective in few weeks/months.** Some emergency loans can suffer from lack of coordination, so that implementation suffers from delays and setbacks. In Panama, for example, the Government and IDB struggled to use all of

- the funds within the two-year allotment. It is important to bear in mind that such loans are carried out in emergency situations, which exacerbate common coordination and capacity limitations.
- 4.14 **The sustainability of infrastructure (mainly roads) and other activities related to response programs depends on the government’s institutional and financial capacity.** For example, a project that provides important disaster-resilient infrastructure cannot be maintained without proper funding beyond the lifetime of the original project. Often these countries used their funds to respond to the worst disaster-related impacts, leaving very few resources for disaster prevention. In addition, lack of technical capacity can limit the effectiveness of tools that require specific training (i.e., data collection and early warning technologies).
- 4.15 **Although the IDB has approved almost US\$986 million for contingency loans, these instruments have not been used.** In interviews, government officials in some countries suggested that there is a desire to have access to these funds but the triggers and condition for disbursing contingency operations are seen too rigid and difficult to achieve. This is especially true for disaster-prone countries, which do not have access to private lending, and for which these loans act as a sort of disaster credit and can help protect already scarce national resources in the case of a natural disaster. Also, these loans have largely replaced the process of restructuring loans in the wake of disasters. Under the old scheme, when a disaster occurred, countries could restructure their existing loans to divert resources to addressing the disaster; of course, this had a negative effect on the original loan. Restructuring can still be used if needed, but contingency loans now serve as a more effective tool. However, their true effectiveness cannot be measured since the funding approved under this instrument has never been disbursed—mostly because of the absence of recent major emergencies in the Region, but also because of the difficulty in achieving the defined conditionalities and reaching the triggers for disbursal. Furthermore, some countries do not have suitable instruments to assess the achievement of the triggers to get the financing.
- 4.16 The only rehabilitation program in OVE’s sample is a regional program (RG-L1006 Grenada Reconstruction, Recovery and Development Program), providing IDB resources to the Caribbean Development Bank (BDC) for the implementation of socially and economically sustainable projects in Grenada, to support economic recovery and rehabilitation after Hurricane Ivan. Interviews with IDB specialists and an assessment of the activities finally financed suggest that the program does not actually focus much on reconstruction. While the institutional capacity of the BDC is sufficient to manage the project after its implementation, the PCR assesses the sustainability of the projects as low, mainly because of the weak achievement of outcomes and outputs and the lack of technical or financial resources for the maintenance of built infrastructure.

V. CONCLUDING REMARKS

- 5.1 **The frequency of natural disasters is on the rise in LAC, although there is no robust evidence that this is linked to climate change.** It is unclear to what extent climate change will influence the occurrence of natural disasters, though projected precipitation changes and rising temperatures may be a factor. It is possible, under most CO₂ emissions scenarios, that climate change will increase flood disaster risk in the Amazon region and the northern and southeastern parts of South America. Likewise, it can be expected that climate change may contribute to greater drought risk in northern and central Mexico and Northeastern Brazil. There is currently no robust evidence that the frequency or magnitude of storms will increase because of climate change. However, the severity of the impacts may increase because a greater number of people are moving into disaster-prone areas and because urban expansion is destroying the natural environments that protect against weather hazards.
- 5.2 **LAC has improved its disaster preparedness and emergency response, though it is still lagging in action to reduce the effects of natural disasters.** Some of the persistent problems relate to lack of local capacity to reduce disaster risk and the scarcity of resources, especially to reduce the drivers of disaster vulnerability. Climate change has only added another layer of complexity to these challenges, as countries find it difficult to conceptualize what it means to adapt to climate change and reduce disaster risk.
- 5.3 **The IDB's DRM strategy has become more structured over time.** From the Action Plan for Improving Disaster Risk Management, the IDB has focused on risk analysis, prevention and mitigation, financial risk management, emergency preparedness, post-disaster rehabilitation and reconstruction, and institutional capacity building. It has also developed several financial instruments to identify, prevent, or mitigate risks, so that it can better address client countries' varied DRM demands. Although the CC Strategy makes an attempt to place DRM in the area of climate change adaptation, the guidelines are not clear on how the two areas complement each other. In the country strategies, for example, although natural disasters are consistently considered and CC and disasters are occasionally considered together, in most cases this relationship is not articulated.
- 5.4 **The IDB is well positioned to support disaster and climate risk management.** The IDB largely models its DRM strategy on the HFA, which represents internationally agreed best practices. Furthermore, the IDB has positioned itself well in terms of *ex ante*, or pre-disaster support: its DRM portfolio comprises mainly *ex ante* measures, and has especially focused, at least in dollar terms, on improving client countries' disaster prevention and preparedness. In addition, the IDB's introduction of contingency loans has provided an important tool for countries to insure themselves against disaster risk, although there are some limitations in achieving conditionalities and the effectiveness of the instrument is not yet assessed.

- 5.5 **However, the IDB's engagement has missed some opportunities.** The IDB has not been successful in accounting for climate change, especially from a conceptual and institutional viewpoint, in disaster risk policy, although it is showing a progressive inclination to respond to climate change in the Region through innovative initiatives. The IDB has shown some ability to penetrate beyond the national level of client countries to support the subnational level, where training and capacity building are most needed, but results are still limited. In general, project implementation problems are linked to governments' lack of institutional capacity and financial resources to carry out DRM programs. Implementation of recommendations and action plans emerged from studies and knowledge products is still a challenge. Finally, lack of information to better design the programs also limits results and their measurement.
- 5.6 **A focus on prevention and preparedness defines 80% of the DRM portfolio.** Prevention objectives, mainly addressed through PBLs and investment loans, have had mixed results. PBLs are the main instrument to drive institutional changes in DRM, although their effectiveness in promoting policy reforms has been limited. In the case of investment projects, the lack of institutional and technical capacity of municipalities or execution agencies has limited the results of some projects, especially in Haiti and partially in Nicaragua. By contrast, Brazil has led the CC and DRM programs under its policies and strong institutional arrangements. The government's institutional capacity and financial support are key to effective implementation of regulatory changes and institutional reforms. The IDB has approved several relevant programs for response (TC, loan, contingency loans, and insurance instruments, among others), but their effectiveness is not measurable yet.
- 5.7 **OVE makes the following suggestions to improve the IDB's work in this area:**
- Define a consistent disaster risk management and climate change adaptation strategy that properly conceptualizes both themes in an integrated climate risk management framework.
 - Provide guidance to client countries through studies and knowledge products that allow better risk assessments at project design and a clear definition of targets.
 - Focus institutional capacity-building activities both at the national and at the subnational level, helping government address DRM and CC, especially in prevention and preparedness through different instruments, as PBLs, investment programs and TCs.

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ANNEXES

Annex A – Social Vulnerability

Besides spatial and territorial disaster vulnerability, there are also disproportionate risks for certain institutions and social groups. The levels of risk that individuals and institutions face are very much influenced by three factors: (1) relative poverty, (2) the particular sector or livelihood strategy in which individuals and institutions are involved, and (3) household duties. This can be true for social groups or communities of people as well as for vulnerable individuals.

It is well documented that the poorer a person is, the less capacity they have to reduce their disaster risk. According to the World Bank (2014b:4):

“Whether adverse consequences come from systemic or idiosyncratic risks, they may destroy lives, assets, trust, and social stability. And it is often the poor who are hit the hardest. Despite impressive progress in reducing poverty in the past three decades, a substantial proportion of people in developing countries remain poor and are vulnerable to falling into deeper poverty when they are struck by negative shocks. The mortality rate from illness and injury for adults under age 60 is two and a half times higher for men and four times higher for women in low-income countries than in high-income countries, while the rate for children under age five is almost twenty times higher. Mounting evidence shows that adverse shocks - above all, health and weather shocks and economic crises - play a major role in pushing households below the poverty line and keeping them there. Moreover, realizing that a negative shock can push them into destitution, bankruptcy, or crisis, poor people may stick with technologies and livelihoods that appear relatively safe but are also stagnant.”

While it is true that the relative value of damages caused by natural disasters tends to be higher in the developed world (where repairs are more costly), the economic impact in developing countries is often higher relative to the size of their economies (World Bank and United Nations, 2010). It is also true that damages to property in the developing world are less likely to be insured, making recovery more difficult.¹ It is estimated that only 1% of losses associated with natural hazards are insured in poor countries, compared to 30% in high-income countries (Linnerooth-Bayer, et al., 2011). Evidence also suggests that when disasters occur, wealthier households are better able to access savings or borrow money to help them recover, while poorer households are much more likely to sell critical productive assets (Agrawal, et al, 2011).

Poverty also tends to push poorer households into areas prone to natural hazards. In Nicaragua, nearly a third of the entire population lives in areas exposed to “disaster, flooding and contamination.” Another 500,000 people live on or near unstable slopes or hillsides at risk for landslides, this risk is ten times more likely for the poorest 20% of the

¹ For example, the ratio of total losses to insured losses from natural disasters in the United States is typically between 2 and 4, whereas in China it has often been close to 50. See Kunreuther and Michel-Kerjan 2012.

population than the richest 20%.² In Santo Domingo, the Dominican Republic, rents are nearly half the price in areas near rivers and gullies than they are in safer areas (Fay 2005).

Natural hazards have the largest impact on sectors that rely on the natural environment. These sectors include: agriculture, water resources, forestry and tourism.³ Health can also be impacted heavily depending on the severity and type of disaster. Damage to infrastructure like roads, airports or seaports can be very costly and have major consequences on commerce, the ability of civil protection units to respond, and long-term development. It is estimated that 80% of global trade in goods is transported by sea (CDKN, 2012). Individuals engaged in these sectors are therefore the most exposed to disaster risk.

Finally, it should be noted that households are not always cohesive and equal and certain household members may be differentially more vulnerable to natural disasters. Various studies have suggested that women, children and the elderly are physically less resilient to natural hazards and, more importantly, are at a socio economic disadvantage. This can lower their capacity to manage risk. Men, too, as the primary breadwinner in many parts of Latin America and the Caribbean may stand to lose more assets and have their livelihoods directly impacted by disasters.

² WDR 2014 team analysis based on Nicaragua Encuesta Nacional de Hogares sobre Medición de Nivel de Vida 2005.

³ For more details on environmental-based sectors see the additional annex by Schneider and Diewald (2014).

**Annex B – Mapping Vulnerability to Disasters in Latin America and the Caribbean
1990-2007 (Maynard-Ford et al, 2008)**

Figure B1. Flood disaster occurrences



EXPLANATION

- | | | |
|--------------------------|-------|---------------------------------------|
| # Flood Disasters | | • Major Cities (Population > 500,000) |
| 0 | 3-6 | ~ Major Rivers |
| 1-2 | 7-12 | |
| | 13-21 | |

Figure B2. Windstorm disaster occurrences



EXPLANATION

- # Windstorm Disasters
 - Major Cities (Population > 500,000)
 - Major Rivers
- | | | |
|-----|------|-------|
| 0 | 3-7 | 13-22 |
| 1-2 | 8-12 | |

Figure B3. Drought disaster occurrences



EXPLANATION

Number of Drought Disasters • Major Cities (Population > 500,000)

- 0
- 1-2
- 3-6
- 7-10

Major Rivers

Figure B4. Landslide disaster occurrences



EXPLANATION

- | | | |
|-----------------------|---------------------------------------|--------------|
| # Landslide Disasters | • Major Cities (Population > 500,000) | |
| 0 | 3-5 | Major Rivers |
| 1-2 | 6-9 | |

Annex C - LAC's Progress under Hyogo

When one combines this theoretical history with the experiences and lessons learned in practice, it becomes clear that the field of DRM is well developed and understood. The Hyogo Framework for Action (HFA), adopted by the UN General Assembly in 2005 is the first internationally agreed upon framework for DRM. The framework outlines a 10-year plan (2005-2015) for countries to reduce their disaster risk through five priority areas. These include: (1) ensuring that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; (2) identifying, assessing and monitoring disaster risks and enhancing early warning; (3) using knowledge, innovation and education to build a culture of safety and resilience at all levels; (4) reducing the underlying risk factors; and (5) strengthening disaster preparedness for effective response at all levels. The OAS (2011) recently reported on LAC's progress in these areas. Below is a summary of their findings.

LAC Progress in HFA Priority 1

There has been considerable achievement by several, but not all, LAC countries in prioritizing DRM and improving its institutional basis (HFA priority 1), especially at the national level. Unfortunately, many of these advances have not trickled down to the local-level. Countries like Mexico and Colombia are at the forefront of DRM systems. These systems elevate DRM as an issue to the highest level of government, and have developed important institutions for funding and scientific research. Other countries, like Peru (with IDB support), have tried to model reforms after these systems with some success. The major shortcomings from these reforms have not been at the national level (though as we will see, there are some) but in implementing them in a functional way at the local-level.

LAC Progress in HFA Priority 2

For priority 2 of the HFA, there has been some progress in developing systems that can predict and evaluate potential weather hazards, but none of these meet the technological standards to be classified as Early Warning Systems (EWS). There is a persistent lack of human and resource capacity to put these systems in place. Still, there have been some advances, for example, the Central American Probabilistic Risk Assessment Initiative or CAPRA is a public risk-modeling platform that helps estimate the impacts of future disasters and develop risk reduction strategies. The CAPRA system was launched in 2008, and is currently being used in all six Central American countries and in several others in South America. According to the World Bank (2012), "the program's success has taken it as far as South Asia, with India, Pakistan and Bangladesh adopting the model."

LAC Progress in HFA Priority 3

There has been considerable improvement by LAC countries in using knowledge to build a culture of disaster resilience (HFA priority 3). Many networks and national programs have been initiated in LAC countries to raise awareness of disaster risk, however, these programs have often been implemented in isolation and have not been effectively coordinated. This has led to the duplication of efforts and many gaps in coverage. In

addition, many of these programs have exhausted their resources and as a result have been discontinued.

LAC Progress in HFA Priority 4

The fourth priority of reducing the underlying risk factors of disasters has largely been unsuccessful in LAC. These risk factors are related to changing social, economic, environmental conditions and land use, and the impact of hazards associated with geological events, weather, water, climate variability and climate change (risk factors as defined by UNISDR). While countries have become quite good at responding to disasters - or at least acquiring the support they need to respond if they lack the capacity - they have largely been unsuccessful in addressing these underlying risk factors. This is because many of these efforts are costly, their benefits are largely uncertain, or they interfere with more important government priorities like economic growth (for example the expanding soy frontier in Brazil, Argentina and Paraguay has led to a certain level of environmental degradation). Not to mention, practically implementing these efforts at the local-level is full of challenges stemming from of a lack of capacity, competing economic and political interests, and a lack of resources.

LAC Progress in HFA Priority 5

The fifth HFA priority of strengthening disaster preparedness for effective response at all levels has been very successful in LAC countries. Countries for the most part have well-structured systems for preparedness and response. This includes emergency plans, state-sanctioned responders, civil protection units, and sources to acquire emergency resources if they are needed. Most countries follow a federalist system of emergency response where local municipalities are the first to respond, but have the ability to easily access state or federal support if the need arises. Countries have even taken this a step further by forming international agreements and networks to provide regional assistance if necessary. According to GFDRR (2010):

“An encouraging sign of regional cooperation is the incorporation of the Coordinating Center for the Prevention of Natural Disasters in Central America (CEPRENAC). This institution was created in 1987 to strengthen disaster prevention and preparedness through regional planning, information sharing, training, and coordination. CEPRENAC’s leadership has enabled the countries to conceive and adopt the Comprehensive Disaster Risk Management Policy for Central America (PCGIR).”

Additionally, in 1991, the Caribbean Disaster Emergency Response Agency (CDERA), which later became the Caribbean Disaster Emergency Management Agency (CDEMA), was adopted. In 2002, the Andean Committee for the Prevention and Treatment of Disasters (CAPRADE) was established. In 2009, the presidents of Argentina, Brazil, Paraguay and Uruguay announced the Special Meeting on Disaster Risk Reduction for Civil Protection and Humanitarian Assistance (REHU). Also in 2009, the Latin America and Caribbean Summit on Integration and Development (CALC) adopted the Declaration of Florianópolis, which defined the mechanisms of sub-regional cooperation to strengthen humanitarian assistance.

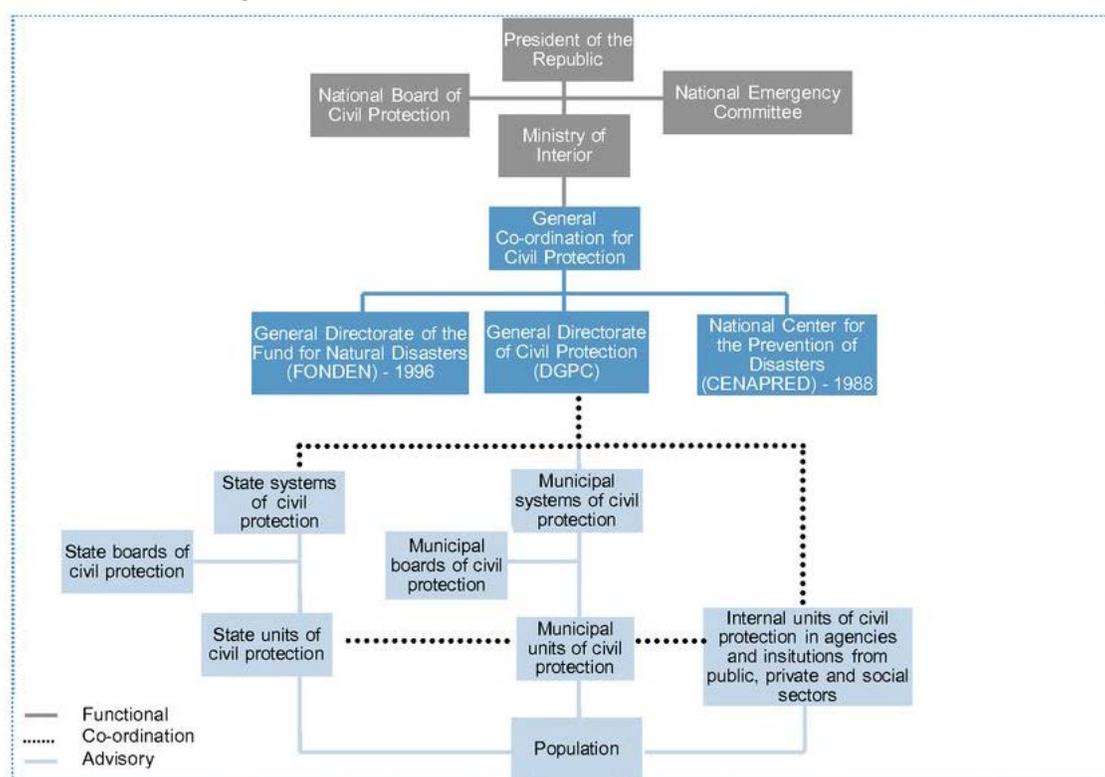
Annex D - Mexico Case Study

In order to better understand the three main challenges ((i) the practical constraints to concentrating more on preventing disasters than responding to them; (ii) the lack of local capacity to manage disasters; and (iii) the problems with coordination and conceptual clarity that exist within governments related to disaster risk reduction) that LAC faces, the report examines of Mexico and its National Civil Protection System (*Sistema Nacional de Protección Civil - SINAPROC*). The reason to examine this system and not others is that it is widely considered to be among the most forward looking disaster risk reduction systems in the world, and certainly in the region. This is because it includes both an agency responsible for disaster prevention and one responsible for financing, two key areas that are often excluded from national civil protection systems (OECD, 2013). The rationale being that if Mexico is facing these challenges, then other countries with much more narrow DRM systems are certainly facing them, but to a greater extent. This case study should be understood as an example only, and not representative of the Region as a whole. However, what we learned through our interviews is that the countries in the Region are, in fact, facing the same challenges as Mexico, but often with much greater severity.

SINAPROC

As is commonly the case, it took a major natural disaster to compel the government to action. In the case of Mexico, it was a major earthquake in 1985 that struck the heart of Michoacán, but also caused major damages to Mexico City. This disaster revealed critical weaknesses in Mexico's civil protection system and showed that they were simply unprepared for such an event. During the following year, 1986, SINAPROC was established. SINAPROC is an integrated system that draws on the comparative capacities of its constituent members. The system achieved its legal foundation through the passing of 2000's General Law for Civil Protection (*Ley General de Protección Civil*) which led to 31 Mexican states and Mexico City developing complementary civil protection legislation between 1992 and 2001. Besides the public sector, SINAPROC also comprises the private sector (e.g. PEMEX) and civil or social sector organizations (e.g. the Red Cross). The Ministry of Interior (SEGOB) coordinates the system from the federal level, which includes three main technical agencies of SINAPROC. These agencies include: DGPC (Dirección General de Protección Civil / General Directorate of Civil Protection), which is in charge of disaster response; CENAPRED (Centro Nacional de Prevención de Desastres / National Center for Disaster Prevention), which is responsible for knowledge generation; and FONDEN (Fondo de Desastres Naturales / Natural Disaster Fund), which is the aforementioned financing mechanism. See Figure B1 for a full layout of SINAPROC's institutional framework.

Figure D1 - Institutional framework of SINAPROC in Mexico



Source: OECD, 2013.

This leads us to the first challenge towards reducing disaster risk in the region, which is the challenge of doing more to prevent disasters than to respond to them. The idea of trying to prevent disasters before they occur is not a novel one. Both the policy makers and the DRM literature are keenly aware of this need. Hallegatte (2012), for example, shows that improving early warning systems in developing countries would yield estimated benefits 4 to 36 times greater than the cost. But still, governments and aid agencies find it difficult to act. Data on international aid shows that over the last thirty years, only 3.6% of total annual spending by international donors on disaster risk reduction was spent on disaster prevention and preparation, while 96% was directed to emergency response and reconstruction.¹ Everybody knows that more needs to be done to improve prevention. Every government interviewee would say the same thing. The problem is not a lack of knowledge about the need to take preventative action, it is more about removing the practical, political and financial barriers to doing so.

Upon closer examination, we find that SINAPROC, even with agencies specifically tasked with researching and funding prevention, still faces many of the same problems

¹ WDR 2014 team based on data from AidData. Disaster prevention and preparation includes donor funding for early warning systems and protection of critical infrastructure, among other items. However, other spending that may improve preparation for disasters—for example, changing the location of roads—may often be classified as more general development spending. To that extent, these figures underestimate donor spending on preparation.

that other countries face in terms of finding ways to prevent disasters before they occur. While it is true that the institutional framework of SINAPROC does prioritize DRM, in practice most of the resources and political energy are funneled towards responding to disasters. According to the IDB's Country Strategy with Mexico (2013-2018), for every dollar spent on disaster prevention in Mexico, US\$34 are spent on response. FONDEN, the national fund for disaster response, has a budget of about \$5 billion a year, while FOPREDEN,² the national fund for the prevention of disasters, has an annual budget of approximately US\$330 million. Furthermore, given the frequency and severity of disasters, these minimal prevention funds are often diverted from FOPREDEN to support emergency response (according to officials in FONDEN). This emergency response is not only for civil protection, but also to make urgent repairs to infrastructure like roads and bridges, which are given precedence over preventative actions. FONDEN officials estimate that they would require at a bare minimum US\$3 billion annually to be able to functionally prevent disasters; this would be a ten-fold increase over current funding levels for prevention.

Mexico's disaster response system operates in a similar way to other federalist systems like those of the United States and Australia. What this means in practice is that municipalities are the first level responsible for disaster response. Once disaster damages exceed the municipality's capacity to respond, they can solicit support from the state-level. Once disaster damages exceed the capacity of the state to respond, they can declare an emergency and solicit support from the federal level. This type of system is designed to respond to emergencies and leaves no room for utilizing response funds for prevention. The Mexican state of Tabasco is a perfect representation of the shortcomings of the system. Every year there are no funds available to reduce disaster risk and every year the state is affected by major flooding. Consequently, it becomes an annual event for the Mexican government to divert massive resources from the federal level to respond to damages in the region. According to the IDB's Natural Resource Specialist in the Mexico office, 90% of disaster risk reduction resources are channeled to the same seven states, less than a fourth of the country.

This leads us to the second challenge of insufficient local capacity. As we have seen, there are simply no funds available to improve local capacity to prevent risk. The OAS (2011) highlighted this deficiency in its evaluation of LAC countries' progress towards the HFA. They describe how awareness-raising campaigns were discontinued in several countries because of a lack of resources. Also, Mexico like every other country in the Region has an underdeveloped disaster alert system compared to that of the United States and Australia. Such a system requires local technology and training, both of which require an influx of resources that are simply not available. Given this lack of resources at the local-level for preventative measures, local stakeholders must decide if investing in these measures is worth the risk. The choice between taking preventative action and simply coping when disasters strike depends largely on how the (certain) costs of preventing risk compare to the (often uncertain) benefits (Ashwill and Heltberg, 2013). While it is true that a lack of resources and knowledge can hamper the ability of local

² FONDEN has three funding instruments: (1) Fondo de Atención de Emergencias, (2) Fideicomiso para la Reconstrucción de Infraestructuras, and (3) FOPREDEN.

communities to prepare for disaster risk, it is important to remember that these communities and individuals are not powerless in the decision making process.

Brazil also faces this challenge, however unlike most countries in the Region they actually have an abundance of public financial resources. Despite this they still lack the technical capacity to put those funds to optimal use. In Brazil over a relatively short period of time, economic growth led to the growth of public budgets, however improving the technical capacity of the workforce and improving the knowledge base of DRM through education and training has not been nearly as fast. This is especially the case at the local level, where resources and training centers are scarcer.

The third issue is the lack of communication and coordination among the various agencies responsible for reducing disaster risk. This was seen to be an issue in all of the countries we visited. In Mexico, while this lack of coordination occurs to a certain extent even for the agencies within SINAPROC (i.e. FONDEN and CENEPRED), it is especially the case for relevant agencies outside of SINAPROC. Most notably, CENEPRED - the agency responsible for the prevention side of disaster research - and INECC (the National Institute of Ecology and Climate Change) – the agency responsible for climate change adaptation (CCA) research – have very few interactions and cooperative planning is limited or non-existent. This is the case, despite the fact that these two agencies are largely tasked with doing the same work since disaster prevention and climate change adaptation entail the same activities.

This lack of communication and coordination is a result of how the DRM and CCA agendas have respectively evolved over time. Disaster prevention resides within the purview of SINAPROC, while climate change adaptation is largely cross-sectoral. In other words, SINAPROC would be partially responsible to reduce environmental degradation under its mandate to reduce disaster risk, but so would SEMARNAT (the Ministry of Environment) under its own mandate to reduce climate change vulnerability. Modern DRM systems began in the 1980s and largely came into their present forms in the early 2000s, while CCA became a priority much later. When the push began in the mid- to late-2000s to create government agencies responsible for CCA there was still a lot of uncertainty about what adaptation was and how it related to disaster risk reduction. As a result, climate change agencies were created separately from disaster risk reduction agencies and institutional mechanisms were designed and implemented separately for each. This reflected a bit of a turf war between DRM professionals and CCA agencies with neither wanting to cede responsibilities to the other. Because of this, it simply became easier to create separate DRM and CCA agencies. Such a system leads to inefficiencies, gaps and uncoordinated or duplicated efforts.

Annex E – Evaluation of DRM in Country Strategies

In order to understand how the DRM Strategy has been applied at the country level, we carried out an analysis of the 10 current IDB country strategies for Brazil, Colombia, Ecuador, Haiti, Jamaica, Mexico, Nicaragua, Panama, Paraguay and Peru. These countries were selected because they represent a mix of LAC regions and contain a diverse set of project portfolios (this is analyzed below). The strategies were analyzed to ascertain the importance of DRM (e.g. was disaster management/reduction considered a priority, was it ignored?) and how relevant the DRM was to climate change (e.g. were they linked).

Country	Importance of DRM	Relevance to CC
Paraguay (2009-2013)	Not important, zero mentions of natural “disasters” or “hazards.” The infrastructure and social sectors are the two priority areas, with climate change being one of the sub-priorities within the infrastructure sector. But there is no mention of DRM issues. Climate change is mentioned as a risk factor, but again nothing on disasters.	Not relevant. Disasters not mentioned anywhere in the country strategy, not even within the climate change section.
Mexico (2013-2018)	Medium importance. “Natural disasters” is seen as a risk factor. “Natural disasters” is considered 1 of 3 strategy implementation risks with macroeconomic and institutional risks. Within the public management sector of the Mexico pillar of increasing productivity, natural disaster is listed as a priority, “promoting risk identification, analysis, prevention, and mitigation and strengthening governance, in order to reduce the fiscal vulnerability of the State and the population to natural disasters.” 1 of 4 risks within the rural development regional pillar, “the risk of natural disasters affecting cropland areas, which may be alleviated by investing in prevention works in vulnerable areas;”	Not relevant. Climate change is considered a regional development priority (with urban and rural development), though there is no mention of disasters within this pillar. Within the risk section, “mitigation and climate change adaptation will help mitigate this (disaster) risk.”
Peru (2012-2016)	High importance. “climate change and disaster risk management” is 1 of 9 strategy pillars. While it is true that having 9 pillars dilutes the significance of each, it is still notable that DRM is considered one (with climate change). “Disasters” are not listed as a risk factor.	Highly relevant. CC and DRM are closely related in this document. The need to integrate CCA into DRM is explicitly mentioned in the document, as is the need to prioritize both. Preventative actions are also highlighted.
Panama (2010-2014)	Low-moderate importance. Not a pillar, not a major risk factor, but mentioned in a specific way.	Not relevant. Climate change and DRM are both mentioned lightly but are not linked in any substantive way. “introducing reserve funds, risk-contingency instruments,

Country	Importance of DRM	Relevance to CC
	<p>“better financial management for natural disaster risks” is 1 of 4 priority actions within the “public finances” sector (1 of 6 pillars).</p>	<p>insurance” are actions to be taken to improve financial management of disasters, these are only modestly related to climate change.</p>
<p>Nicaragua (2012-2017)</p>	<p>Moderate importance. Not a pillar, but considered a major risk factor. “risks deriving from the possible occurrence of natural disasters” is 1 of the 4 main risks for the implementation of the country strategy. Natural disasters are also identified as 1 of the 3 main risks to the transportation pillar (1 of 4 priority sectors).</p>	<p>Not relevant. Climate change is of rather low importance in the strategy. It is mentioned but not as a priority sector or a main risk. Furthermore, climate change and “natural disasters” are mentioned separately and not considered together. There is mention of reducing CC vulnerability but this doesn’t include DRM.</p>
<p>Jamaica (2013-2014)</p>	<p>High importance. “Disaster Risk Management and Climate Change Adaptation” is the only priority cross-cutting theme, placed with equal importance as the 3 main sector priorities, which include: (i) Fiscal Sustainability; (ii) Social Protection and Safety; and (iii) Financial Sector & Business Climate. In addition, “disaster risk” is listed as 1 of 3 main risks to the country strategy. To sum, “disasters” is considered both a risk and a priority in its own right. It is also fully integrated with CC as it should be.</p>	<p>High relevance. In the previous country strategy (2006-2009 but lasting until 2013) “reducing vulnerability to natural disasters” was 1 of 3 priority sectors. This has evolved into the cross cutting theme of “Disaster Risk Management and Climate Change Adaptation.” In this theme, actions are planned to address both CRM and CCA. The strategy acknowledges the convergence of the responses to both challenges (disasters and CC).</p>
<p>Haiti (2011-2015)</p>	<p>Moderate importance. Despite being considered a recurring problem in Haiti, natural disasters are not a priority sector, but only a risk factor. “Natural disaster risks” is considered 1 of 6 main risks to the country strategy. It is also listed as a risk factor for achieving the goals of agriculture, and also is part of the main objective for the agricultural objective (reduce losses due to disaster events).</p>	<p>Low relevance. Climate change is mentioned in several parts of the strategy, but not as a priority or main risk. Furthermore, it is generally not considered together with “natural disasters” except briefly as a risk related to agricultural production.</p>
<p>Colombia (2012-2014)</p>	<p>Moderate-to-high importance. Risk management of natural disasters is listed as 1 of 10 priority areas. These include: “(i) transportation, (ii) science, technology, and innovation; (iii) trade, (iv) access to financial services, (v) education and vocational training, (vi) social protection, (vii) health, (viii) water supply and sanitation, (ix) housing and urban development, (x) risk management, and (xi) governance and modernization of the State.” The fact that there are so many priority sectors dilutes the significance of any one, individually. “Disasters” are not considered 1 of the 3 main risk factors in</p>	<p>Moderate relevance. Climate change is listed as one “area of dialogue,” which will make it a focus of knowledge support, though natural disasters is not. It is only 1 of 10 areas of dialogue, which include: “(i) agriculture, (ii) environmental management and adaptation to the consequences of climate change, (iii) entrepreneurship promotion policies, (iv) fiscal policy, (v) citizen security, (vi) energy efficiency and renewable energy, (vii) government policy monitoring and evaluation system, (viii) information and communication technologies, (ix) international cooperation, in particular, south-south cooperation, and (x) integration.” Still climate change is mentioned</p>

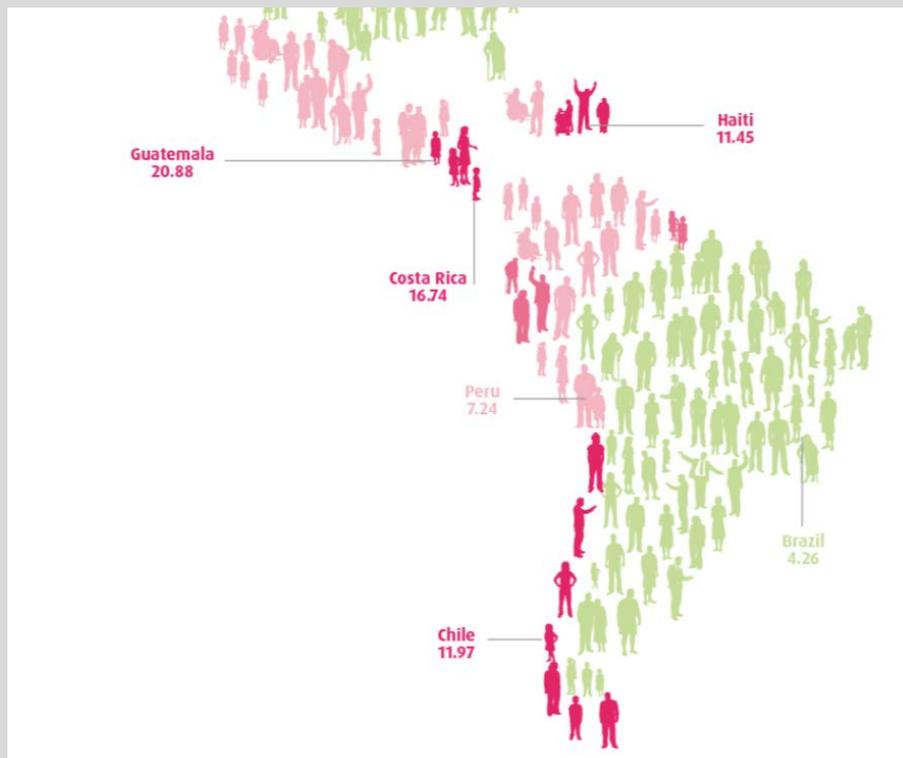
Country	Importance of DRM	Relevance to CC
	<p>the risk assessment, but it is listed as a challenge related to the risk of “fiscal adjustment.” “Natural disasters” is not listed as an area of dialogue, which would prioritize it as a priority for knowledge support, but this should not be considered a slight, since Colombia has one of the regions most advanced national DRM systems (National Disaster Prevention and Management System (SNPAD)), so may not need such support.</p>	<p>consistently within the “risk management” priority section. Though the relation between DRM and CCA is not articulated. It is mentioned that the IDB will provide “assistance the government is moving ahead on a work agenda for climate change disaster preparedness.” But this is not described in any detail in the strategy.</p>
<p>Brazil (2012-2014)</p>	<p>Moderate importance. Natural disaster risk is 1 of 4 main risks to the strategy, though it says, “recent experience shows that situations of this type (natural disasters) tend to have only a marginal effect on Brazil’s programming with the Bank.</p>	<p>Low relevance. Climate change is 1 of 6 major strategic objectives: (i) stimulate social and productive inclusion; (ii) improve the condition of the country’s infrastructure; (iii) promote the development of sustainable cities; (iv) improve the institutional capacity of public entities; (v) <u>increase the sustainable management of natural resources and climate change mitigation and adaptation actions</u>; and (vi) promote development through the private sector, though it is only half of that priority (with natural resource management) so in reality it is only 1 of 16 listed sub-sectors. Despite the prevalence and frequency of “climate change” in the Brazil country strategy, it is never mentioned in relation to disasters.</p>
<p>Ecuador (2012-2017)</p>	<p>High importance. Natural disaster risk management is listed as 1 of 8 priority areas. These areas include: (i) energy; (ii) transportation and logistics; (iii) social development; (iv) access to finance; (v) fiscal management; (vi) urban sustainability; (vii) rural development; and (viii) natural disaster risk management. “Natural disasters” are not listed as a major risk factor.</p>	<p>Low-to-moderate relevance. The topics of diversity, climate change and environmental sustainability are addressed as crosscutting issues in this strategy. It is implicit that disasters are considered a result of climate change, or at least related, though this relationship is not articulated. “Climate change” is not listed within the natural disaster risk management priority area.</p>

Source: authors based on Country Strategies

Annex F – World Risk Index

Box F1 – World Risk index

The World Risk Report annually constructs an index that measures disaster risk. This index takes into account four variables, including exposure to natural hazards, the susceptibility of suffering harm, coping capacity and long-term adaptive capacity. As can be seen from figure C1, the countries most at risk are those bordering the Caribbean and Pacific Ocean; landlocked and Atlantic coast countries have lower relative vulnerability (figure C1). Dark green (grey) are the countries least at risk while those in dark red (black) are those most at risk.



Source: UNU-EHS (2012), World Risk Report, World Risk Index, Based on the PREVIEW Global Risk Data Platform, CReSIS, CIESIN and global databases; detailed information at www.worldriskreport.org, Bündnis Entwicklung Hilft" (Alliance Development Works), The United Nations University, the Institute for Environment and Human Security.