ove Office of Evaluation and Oversight

Thematic Evaluation

Climate Change at the IDB:

Building Resilience and Reducing Emissions

IDB
Inter-American Development Bank
November 2014

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-459-1). 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.

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Climate Change and the IDB

Building Resilience and Reducing Emissions

Office of Evaluation and Oversight (OVE)

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Abbreviations

BRTS	Bus rapid transit system
CAN	Andean subregion
CC	Climate change
CCA	Climate change adaptation
CCB	Caribbean subregion
CCS	Climate Change and Sustainability Division
CID	Central America and Mexico subregion
CCLIP	Conditional credit line investment project
CIF	Climate investment funds
CO_2	Carbon dioxide
CO_2eq	Carbon dioxide equivalent
CS	Country Strategy
CSC	Southern Cone subregion
CTF	Climate Technology Fund
DRM	Disaster risk management
EE	Energy efficiency
EM-DAT	Emergency Disasters Database
ESG	Environmental and Safeguard Unit
FIP	Forest Investment Program
GCF	Green Climate Fund
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
IDB	Inter-American Development Bank
IDB-9	Ninth General Capital Increase of the IDB
INE	Infrastructure Sectorial Division
IPCC	Intergovernmental Panel on Climate Change
KNL	Knowledge and Learning Unit
LAC	Latin America and the Caribbean
LUCF	Land use change and forestry
LULUCF	Land use and land use change and forestry
MDB	Multilateral development bank
MWh	Megawatts per hour
NAMA	Nationally Appropriate Mitigation Action
NSG	Non-sovereign guarantee
OVE	Office of Evaluation and Oversight
PBL	Policy-based loan
PCR	Project Completion Report
PMR	Project Monitoring Report
RE	Renewable energy
REDD	Reducing Emissions from Deforestation and Forest Degradation
RES	Research Department
SCF	Structured and Corporate Finance Department
SECCI	Energy and Climate Change Initiative
SFD	Sector Framework Document

SG	Sovereign guarantee
SIDS	Small Island Developing State
SPD	Office of Strategic Planning and Development Effectiveness
TC	Technical cooperation
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VPC	Vice-Presidency for Countries
VPP	Vice-Presidency for Private Sector and Non-Sovereign Guarantee
VPS	Vice-Presidency for Sectors
WWI	World Watch Institute

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Climate change poses important risks to development in Latin America and the Caribbean, affecting productive infrastructure and people's livelihoods.

Executive Summary

Climate change (CC) poses important risks to development in Latin America and the Caribbean (LAC), affecting productive infrastructure and people's livelihoods. Adapting to CC and limiting its negative impacts will be important in achieving sustainable development and equity, including poverty reduction and long-term economic growth.

LAC's share of global greenhouse gas (GHG) emissions (9%) is slightly higher than its share of global GDP and world population. Together, energy, agriculture, and land use change (deforestation) account for about 80% of the Region's GHG emissions. Emissions from agriculture and energy are concentrated in Argentina, Brazil, Chile, Colombia, Mexico, and Peru, while Brazil accounts for the bulk of emissions from land use change. Road transport is the fastest-growing source of energy-related GHG emissions in LAC.

LAC countries are increasingly incorporating CC in their national policy agendas. Many are committed to maintaining a low-carbon energy matrix and promoting renewable energy and energy efficiency. Brazil, in particular, has been very successful recently in reducing deforestation in the Amazon, although increasing global demand for food exacerbates pressures for agriculture expansion and threatens remaining forests. Several countries in the Region are implementing sustainable transport initiatives, although most are challenged by inefficient public transport, growing motorization, and increasing trucking of freight. Strategies for climate adaptation are less developed than those for mitigation. Improvements have taken place in managing disaster risks, for example, but overall the Region is lagging in the development of early warning systems and prevention schemes. Approaches to climate adaptation in transport and energy are just beginning to be considered.

The Inter-American Development Bank (IDB, or the Bank) has stepped up its efforts to support LAC in its development activities linked to CC. The international community has asked the multilateral development banks to help mobilize resources to address

Almost 70% of the climate change portfolio is composed of projects with potential climate change mitigation co-benefits, predominantly in the energy and transport sectors.

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CC by providing direct financing and leveraging additional climate investments. The IDB launched its first Sustainable Energy and Climate Change Initiative (SECCI) in 2007, using its ordinary capital and leveraging resources through a multidonor trust fund. In 2010, the Ninth General Capital Increase reinforced IDB's commitments, identifying CC as one of its five institutional priorities and including a specific lending target of 25% for climate-related initiatives, sustainable (including renewable) energy, and environmental sustainability. In 2011, the Bank approved an Integrated Climate Change Mitigation and Adaptation Strategy (CC Strategy) with five lines of action: (i) develop instruments to mainstream CC in Bank operations, (ii) strengthen the knowledge base for clients and staff, (iii) expand lending and technical assistance in key sectors, (iv) strengthen institutional frameworks, and (v) scale up investments, addressing financing gaps and leveraging private sector investments for CC in the region.

This is OVE's first evaluation of IDB's interventions and institutional set-up related to CC. It seeks to document IDB's efforts and results to date, identify lessons to guide future engagement, and provide recommendations for Bank Management. Given the growing body of recent IDB experience and the major global negotiations that are under way, the time is ripe for such an evaluation. Although IDB's explicit mandate and CC Strategy are relatively new, the Bank's climate-related activities go back much further in time. The evaluation thus takes a broader perspective, reviewing the past decade of operations in key climate-relevant sectors selected by OVE—energy, agriculture and natural resources, transport, and disaster risk management—that contribute

to building climate resilience (adaptation) or reducing emissions (mitigation) as an explicit objective or as a co-benefit to other development goals. The evaluation is built on extensive sector analysis and country field work: OVE has reviewed the entire IDB portfolio and any relevant strategy documents in the selected sectors and countries, and has conducted a great number of country missions and interviews.

Progress on IDB's Strategic Lines of Action

The evaluation finds that the Bank has made some progress toward achieving the five objectives of the CC strategy, although it still has a way to go. The Bank's organization has evolved and adjusted to advance CC mainstreaming, supporting staff's technical skills and knowledge generation, though further organizational focus is needed. CC mainstreaming is still not fully reflected in sector and country strategies or lending programs. Although OVE's analysis suggests that the CC-related portfolio has increased in recent years, the IDB still needs to strengthen the information system that reliably identifies the Bank's contribution to CC mitigation and adaptation. Private sector engagement has also increased, as have efforts to help governments strengthen their institutional structures to deal with CC. Looking forward, the IDB needs to define specific niches where it can develop clear comparative advantages. It needs to improve mainstreaming instruments, including wider application of climate-risk screening tools, vulnerability assessments, and measurement of GHG emissions in relevant ongoing activities. And its organizational arrangements need to keep promoting mainstreaming and ensuring strong cross-sector collaboration and knowledge sharing.

OVE's analysis indicates that the CC-related portfolio—that is, projects with explicit or implicit CC mitigation and adaptation co-benefits—has increased over time. In the four selected sectors included in this evaluation, OVE found 796 CC-related projects (239 loans and 557 grants) with a total approved amount of US$20.7 billion. Public sector investment loans represent half of the approved amounts (54%), while private sector lending and policy-based loans (PBLs) account for 24% and 18%, respectively. Technical cooperation and investment grants account for the remaining 4%. The distribution of CC-related projects is fairly uniform across LAC subregions, although their sector focus varies. A quarter of the loans in the portfolio have explicit CC objectives; the rest focus on other development objectives (such as increasing agricultural competitiveness, reducing transportation costs, or improving access to energy) but have potential CC co-benefits. IDB's climate-related lending expanded rapidly beginning in 2007, reaching a peak of US$3.5 billion (31% of the total IDB portfolio) in 2011, and it has declined to 15% of the IDB portfolio in 2013 (US$2.1 billion). On average, the CC portfolio represented 19% of the total IDB portfolio from 2004 through 2013.

IDB's portfolio has focused more on CC mitigation than on climate adaptation. Almost 70% of the CC portfolio is composed of projects with potential CC mitigation co-benefits, predominantly in the energy and transport sectors. Projects with potential

climate adaptation co-benefits represent 19% of the total and are predominantly in agriculture, disaster risk reduction, and sustainable transport. About one-tenth of the projects, including several PBLs, potentially address both CC mitigation and adaptation.

Progress in addressing Climate Change Mitigation

OVE's calculations indicate that some IDB projects, most notably in energy, have contributed to GHG emission reduction. The largest and most quantifiable reduction of GHG emissions has come from investments in renewable energy: new investments in hydropower plants or rehabilitation of existing ones, investments in wind power generation, and carbon offsets for a private sector coal-based power project. In OVE's estimates, the Bank's direct investments in renewable energy (hydropower and wind energy) will potentially mitigate close to 10 million tons of CO2eq per year—equivalent to at least 2% of LAC's overall electricity emissions. The Bank has also contributed to the growing knowledge base on renewable energy, which can support the long-range development of alternative energy sources.

Although improvements in energy efficiency have perhaps the greatest potential impact in reducing GHG emissions at the lowest cost, IDB participation in energy efficiency projects has been limited. Energy subsidies in the Region—which keep prices low and encourage overconsumption—remain a key barrier.

Several transport operations have also led to GHG emission reductions. Urban transport projects supporting bus rapid transport systems stand out in this regard, though these projects have not reached their full potential because of weaknesses in complementary policy measures such as scrapping polluting buses and creating fuel quality standards. Road projects have also led to some reductions in emissions relative to business-as-usual scenarios, although projections of expected emissions reductions may be overoptimistic where project designers have underestimated induced demand or possible deforestation implications.

The Bank has recently increased its focus on CC mitigation in agriculture and natural resources, though to date it has provided relatively little support to forest protection and management or to livestock. Recently approved projects in Brazil, Peru, and Mexico appear promising. Greater attention to these sources of GHG emissions is warranted and might emerge with implementation of the Forest Investment Program and with a more systematic approach to CC mainstreaming in the Bank.

The Bank has yet to define clear guidelines with respect to measuring and mitigating GHG emissions. Even in projects with explicit CC objectives, project designs contain little information on GHG emission baselines or climate adaptation strategies. Monitoring systems rarely report on project contributions to addressing CC. This may well emerge as an important challenge, in IDB and other multilaterals, as CC-related activities become more intense in the future.

Progress in Addressing Climate Adaptation

Climate adaptation results are particularly difficult to assess and measure. The evaluative findings show that IDB has been mostly reactive in responding to current and future climate risks. The IDB needs to expand its assessments of climate risks in relevant interventions and find innovative ways to integrate these risks and opportunities into development activities.

The Bank's strategic focus in agriculture and natural resources—promoting agricultural public goods, strengthening weather and water monitoring, and increasing the income and adaptability of the rural poor—is highly relevant to climate adaptation. Although the portfolio in these areas is relatively young and results have still to materialize, the Bank can play a larger role in the policy dialogue with governments and the generation and dissemination of knowledge in these areas.

The IDB has a long history of supporting disaster risk management in the region, and its portfolio is well aligned with country vulnerability levels. LAC is highly vulnerable to natural disasters, which impose severe economic and social costs on the countries concerned. The majority of IDB financing in this area is for disaster prevention and preparedness; support for climate risk assessment—a key to climate adaptation—has been very limited. Going forward, the Bank needs to draw stronger links between climate adaptation and disaster risk management.

Attention to climate adaptation in transport and energy is just beginning. Climate vulnerability will continue to increase in these and other sectors. The Bank and the LAC countries are in the very early stages of thinking through these issues. Going forward, the IDB will need to continue developing knowledge and experience on addressing climate risk and climate adaptation needs.

Recommendations

Given the findings summarized in this report and the accompanying annexes, OVE offers the following four recommendations to IDB Management. They all build on existing practices but represent important changes that will require going beyond business-as-usual.

- Strengthen the mainstreaming of CC concerns in IDB by maintaining a highly qualified CC group whose mandate and incentives are to provide cutting-edge technical knowledge and support to divisions in all three operational Vice-Presidencies—VPS, VPC, and VPP. This unit can be organizationally situated in any number of places in the Bank. Wherever situated, it needs to have a clear mandate and incentives to work across sectors and VP boundaries to help mainstream CC issues in both country and sector strategies and in both sovereign-guaranteed (SG) and non-sovereign guaranteed (NSG) operations. Incentives

can include, for example, recognition of effective mainstreaming support in performance evaluations and career development, responsibility for mobilizing and monitoring IDB's use of external climate funds (GEF, CIF, and others), and responsibility for implementing and maintaining the CC classification and tracking system for the Bank.

- Deepen IDB's engagement in policy dialogue and operational support to address climate change adaptation challenges in relevant sectors. Strong measures are needed to anticipate and reduce the negative impacts of current and projected future CC and thereby increase climate resilience in LAC. This requires that climate risks be considered in relevant projects from the design stage onward, taking into consideration the needs of vulnerable people.

- Markedly strengthen the coordination between the Bank's public sector and private sector windows and scale up efforts to mobilize external resources to leverage the Bank's work. The Bank needs to develop a clear and focused strategy that will help it deploy its scarce human and financial resources to maximize its contributions and co-benefits. Two likely areas of comparative advantage and additionality are its ability to work on both the public and private sector sides—for example, on the policy framework as well as on the financing—and its ability to mobilize additional financing.

- Deepen the Bank's ability and incentive to track its activities and results related to CC mitigation and adaptation. With regard to activities, more precise criteria are needed to classify the Bank's CC portfolio and track the level of Bank activity in relevant projects. With regard to results, both Project Completion Reports (for SG operations) and Expanded Project Supervision Reports (for NSG operations) should be required to identify and discuss CC-related co-benefits in projects with significant potential impacts on GHG emissions or climate resilience. Although such co-benefits are often difficult to measure precisely, progress in measuring results is likely to develop with experience.

In 2010, the Ninth General Capital Increase (IDB-9) Agreement reinforced the IDB's support for climate change.

1 Introduction

Climate change (CC) affects individual households and economies, and it presents important risks to development in Latin America and the Caribbean (LAC). Limiting the impacts of CC is necessary to achieve sustainable development and equity, including poverty reduction and long-term economic growth in the Region (IPCC, 2014). There is now a global consensus that "CC presents an urgent challenge to all countries' well-being, and that effective climate action requires a two-pronged response—adaptation to manage the unavoidable, and mitigation to avoid the unmanageable" (World Bank, 2009).

The multilateral development banks (MDBs) have been called on to play a key role in mobilizing financial resources for addressing CC. In 2010 the high-level Advisory Group on Climate Finance to the Secretary General of the United Nations (UN) concluded that MDBs "can play a significant multiplier role and leverage additional climate investments" (UN, 2010). In 2013, MDBs contributed around US$23 billion in climate finance (MDBs, 2014).

A. IDB OBJECTIVES AND MANDATE RELATED TO CLIMATE CHANGE

In the past decade, the Inter-American Development Bank (IDB, or the Bank) has stepped up its efforts to support LAC countries in their development activities linked to CC. In October 2005, the IDB presented an Action Plan for Renewable Energy, Energy Efficiency, Greenhouse Gas Mitigation and Carbon Finance for 2006-2010. The plan identified short- and long-term actions to increase investment in renewable energy (RE) and energy efficiency (EE) and increase carbon finance in Bank projects. In 2006, the Bank adopted a new Environment Policy, which requires the Bank to report on the greenhouse gas (GHG) emissions of its activities and lending and explicitly states that *"promotion of renewable energy, the efficient and clean use of energy resources, and the reduction and control of GHG emissions are*

environmental priorities" (IDB, 2007). In 2007, the IDB launched the Sustainable Energy and Climate Change Initiative (SECCI),[1] financed by the Bank's own ordinary capital resources and by a multidonor fund.

In 2010, the Ninth General Capital Increase (IDB-9) Agreement reinforced the IDB's support for CC. The IDB-9 identified as one of its five priorities to "protect the environment, respond to climate change, promote renewable energy, and ensure food security" (IDB, 2010). The IDB-9 Agreement included a lending target of 25% of its total lending, to be reached by the end of 2015, to support climate-related initiatives, sustainable (including renewable) energy, and environmental sustainability, up from an estimated lending baseline of 5% in 2006-09. It also required that the IDB develop *"an integrated strategy for climate change mitigation and adaptation and for sustainable and renewable energy"* to guide its support for CC work. The Bank submitted the Integrated Climate Change Mitigation and Adaptation Strategy (CC Strategy) to the Board of Executive Directors in March 2011. In January 2012, a new Climate Change and Sustainability Division (CCS) was created in the Vice Presidency for Sectors (VPS), and an Action Plan for the CCS was approved in February 2012.

The CC Strategy guides the IDB in scaling up its support for actions to mitigate and adapt to CC in the Region. The CC Strategy identified five specific lines of action for the IDB: (i) develop instruments to mainstream CC in Bank-funded operations; (ii) strengthen the knowledge base for clients and staff; (iii) expand lending and technical assistance in key sectors; (iv) strengthen institutional frameworks; and (v) scale up investments, addressing financing gaps and leveraging private sector investments for CC in the Region.[2] An Action Plan for 2012-15 was issued in 2012, detailing the activities and emphasizing cross-cutting issues (IDB, 2012a).

B. Objectives, evaluation questions, and methodology

This is OVE's first evaluation of IDB's interventions and institutional set-up related to CC. It is meant to promote both accountability and learning. The time is ripe for such an evaluation, as the IDB has established an institutional mandate and has almost a decade of operational experience with supporting climate-related projects. Moreover, major negotiations are under way in preparation for (i) the 20th session of the Conference of the Parties (COP 20) to the United Nations Framework Convention on Climate Change (UNFCCC), to be held in December 2014 in Lima, Peru; and (ii) the COP 21, to be held in Paris in November 2015, where it is hoped that a global agreement will be reached. It is important to understand how LAC countries have responded to the new context and what the IDB has learned over the past decade from its increasing support for climate-related initiatives.

This evaluation seeks to document and draws lessons from the recent IDB experience related to CC. It focuses on Bank-financed operations in important climate-related sectors—energy, agriculture and natural resources, transport,

and disaster risk management—that directly support building climate resilience (adaptation) or reducing emissions (mitigation), or that have these outcomes as co-benefits (Box 1). It seeks to identify factors that affect the success of various interventions and to provide recommendations for future Bank support on CC in LAC countries.

Box 1: Definitions of adaptation and mitigation

The Intergovernmental Panel on Climate Change (IPCC) provides the following definitions of adaptation and mitigation:

"Mitigation: A human intervention to reduce the sources or enhance the sinks of greenhouse gases."

"Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate and its effects."

The IPCC has further developed this definition of adaptation based on scientific progress:

- "Autonomous adaptation: Adaptation in response to experienced climate and its effects, without planning explicitly or consciously focused on addressing climate change. Also referred to as spontaneous adaptation."
- "Transformational adaptation: Adaptation that changes the fundamental attributes of a system in response to climate and its effects."

Source: IPCC (2014a).

OVE's evaluation addresses the following guiding questions:

- How has the IDB's engagement in areas that have significant links to CC evolved over the past decade?
- How can the IDB best work with countries to set priorities and to mainstream CC concerns in Bank activities?
- What are the strengths and weaknesses of the IDB's actions and interventions in support of the Region's efforts to address CC to date?
- What have been the main results of IDB support to date? To what extent have IDB's climate actions and interventions translated into reducing GHG emissions and building climate resilience? To what extent is IDB able to measure these results?
- How can IDB increase the impact of its future interventions in increasing climate resilience and reducing GHG emissions in LAC?

The most vulnerable to climate change are the rural poor and indigenous populations who are most dependent on natural resources for their livelihood and well-being.

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To address these questions, OVE reviewed a broad range of the IDB's activities that it identified as climate-related and developed an evaluation framework to analyze them in selected operations, sectors, and countries (see Annex I). The evaluation period covers 2004-2013. The universe of IDB operations is based on the Bank's overall 2004-2013 portfolio identified by OVE as being of relevance from the CC perspective—that is, all interventions that contribute to climate change mitigation and adaptation, either as a primary objective or while promoting other development or sectoral goals such as economic growth, agricultural productivity, or energy efficiency—in the four selected sectors mentioned above.

The evaluation has two main building blocks:

- Sector studies. OVE identified key areas in the Bank's core development business that may be vulnerable to the impacts of CC and that can contribute to reducing GHG emissions and increasing climate resilience: agriculture and natural

resources (irrigation), disaster risk management (DRM), energy, and transport. For each sector OVE prepared a Sector Study.[3] The evaluation is not intended to be a comprehensive assessment of the IDB's sector portfolios; rather, it focuses on projects that have or could have had explicit goals for or impact on reducing GHG emissions and building climate resilience in the four selected sectors.

- Portfolio overview of IDB CC-related operations (January 1, 2004, to December 31, 2013). For this period, the Bank did not have a consistent CC labeling system that could be applied to directly identify operations related to CC.[4] OVE built a database with potential CC-related projects (investment loans, policy-based loans, private sector loans, and investment grants and technical cooperation) from the sectors evaluated.[5] The CC-related evaluation portfolio was constructed using IDB guidelines and international standards as well as sector-based expert opinion. The portfolio overview provides a picture of the Bank's activities and the instruments used, and it shows how they have evolved over time.

OVE also carried out 11 country missions as part of this evaluation. Country missions consider the complexity and heterogeneity of CC within and across countries and allow for assessing co-benefits and broader development achievements in each country. The selection of countries highlighted geographical, income, and climate impact heterogeneity, emphasized countries with high levels of Bank activity, and represented different levels of GHG emissions and climate vulnerability and readiness.[6] OVE also reviewed a sample of CC-related publications produced by the Research Department (RES) and the CCS division, and CC Sector Notes produced as inputs for Country Strategies (CSs), assessing the soundness of each product's climate-related analysis. Throughout the process, OVE conducted interviews with country government staff, civil society, and IDB staff.

The evaluation is organized into six chapters. Following this introduction, Chapter II presents the rationale for CC interventions. Chapter III assesses the progress IDB has made toward achieving the objectives of its CC Strategy. Chapter IV addresses the results of IDB's support for projects with potential CC mitigation co-benefits in key sectors, with a particular focus on energy and transport. Chapter V addresses the results of IDB's support for climate adaptation in key sectors, most notably agriculture and natural resources and DRM. Chapter VI concludes by providing recommendations to help the IDB frame its future activities in support of its client countries in LAC.

During 2007-2012 alone, the Region experienced around 340 extreme weather and climate events, including flood and droughts. Finally, the sea level has risen in most coastal areas by about 0.2 meters during the 20th and 21st centuries

2 The Context: Climate Change in LAC

Scientific evidence from the increasing availability of hydrological and meteorological observations confirms that the climate is changing in LAC. In 2013, the fifth assessment report of the International Panel on Climate Change (IPCC, 2013) showed that over the last 20 years, the average temperature in LAC has increased by about 0.1 degree Celsius per decade—with a regional hot spot in central South America, where the warming is twice the global mean.

Across the Region, temperatures are projected to increase at a rate equal to or above the global mean. Glaciers are receding in response to changes in temperature, and many may entirely disappear in the coming century.[7] Furthermore, in recent decades, rainfall changes show strongly irregular patterns across LAC.8 Precipitation is projected to decrease in most of Mexico, Central America, the Caribbean, and the Amazon. The general pattern of change suggests that precipitation intensity is increasing nearly everywhere else, resulting in enhanced risks for flooding. At the same time, there is a clear increase in the number of consecutive dry days almost everywhere, which also suggests an increased risk for droughts. During 2007-2012 alone, the Region experienced around 340 extreme weather and climate events, including flood and droughts. Finally, the sea level has risen in most coastal areas by about 0.2 meters during the 20th and 21st centuries (see Annex VI).

LAC countries are vulnerable to CC. The Caribbean and Central American countries and Mexico are among the most vulnerable to natural disasters because of their geographic location and socioeconomic variables. Extreme weather events are likely to intensify in those countries, potentially affecting key economic sectors such as agriculture and tourism. Rising sea levels might also increase the risks of storm surges and groundwater saline intrusion, affecting water resources. In the Andean countries and the Southern Cone, glacier retreat will initially increase flood risk and reduced water supply. The Amazon Basin countries could be faced with increasing conversion of tropical forest to savanna, affecting the Region's rainfall patterns.

The socioeconomic impacts of CC in LAC are also significant. The 340 extreme weather events during 2007-12 are estimated to have caused nearly 8,000 fatalities, affected more than 37 million people, and led to economic costs of more than US$32 billion.[9] A modeling exercise commissioned as part of this evaluation indicates that by 2050 CC is likely to affect the welfare of households in both rural and urban areas. Because of the CC impacts on agricultural production (yield change) and international food prices, unless proper mitigation measures are implemented, by 2050 Brazil and Mexico may face economic loses between US$45.4 billion and US$304 billion and between US$60.8 billion and US$141.2, respectively. Peru, with a different productive structure, may face both economic gain and loss (a gain of US$16.7 billion against a loss of US$18.8 billion). At the household level, by 2050 Brazilian households may lose 4.3%-28.8% of one year's income, and Mexican households 8.0%-18.6%.[10]

The most vulnerable to CC are the rural poor and indigenous populations who are most dependent on natural resources for their livelihood and well-being. These groups live mostly in poor regions and environmentally fragile areas that are especially prone to natural hazards. They also have scant alternative means of livelihood and little access to technical knowledge and credit. Approximately two-thirds of the rural populations living in poverty are small-scale farmers, and half of the rural poor have only limited access to the productive resources they need to generate adequate agricultural incomes. Indigenous people in the Andes valleys, the rural poor in Northeast Brazil and the semiarid basins of Argentina and Chile, and the smallholders living from rainfed maize production in Central America and Mexico are deemed to be the most vulnerable to crop-water stress, yield reductions, and drought. Not only is the viability of their livelihoods threatened, resulting in food insecurity and poor health, but their cultural integrity is also being challenged (Verner, 2010; Kronik and Verner, 2010).[11]

Infrastructure is highly vulnerable to CC. In the transport sector, for example, CC may affect the integrity of the infrastructure and the reliability of movement of goods and people. CC can affect transport systems in two ways: it can disrupt the availability of fuels and electricity needed to provide transport services, and it can damage transport infrastructure and disrupt transport services. Increased rainfall, prolonged droughts, rising sea levels, and extreme events can all compromise the integrity of transport systems, affecting critical segments of the network, reducing service capacity, and impeding access during emergencies (see Annex V). In the energy sector, water supply is as concern in a region that depends on hydropower for 50% of its electricity. LAC has already experienced reduced hydropower capacity due to droughts. For example, the drought in Brazil and Costa Rica in the early 2000s reduced energy generation significantly, causing important losses. In addition, glacier retreat could cost Peru's electric power sector between US$212 million if a gradual adaptation scenario is implemented and US$1.5 billion under rationing conditions (Vergara et al., 2007).

A. LAC contribution to climate change

IDB's 26 member countries in LAC (LAC-26) contribute 7.8% to global GDP and account for 8.4% of the world's population, while their share of GHG emissions is 9.1%.[12] Energy, agriculture, and land use change and land use and forestry (LULUCF) are the largest contributors to the Region's GHG emissions, accounting for about 29%, 28%, and 22% of total GHG emissions, respectively (Figure 1). GHG emissions from transport, the fastest-growing subsector in the energy sector, doubled between 1980 and 2005 to 13% of total emissions. LAC-26's GHG emissions decreased after 2005, largely because LULUCF emissions fell by 44% between 1990 and 2011, mainly as a consequence of reduced deforestation in the Brazilian Amazon.

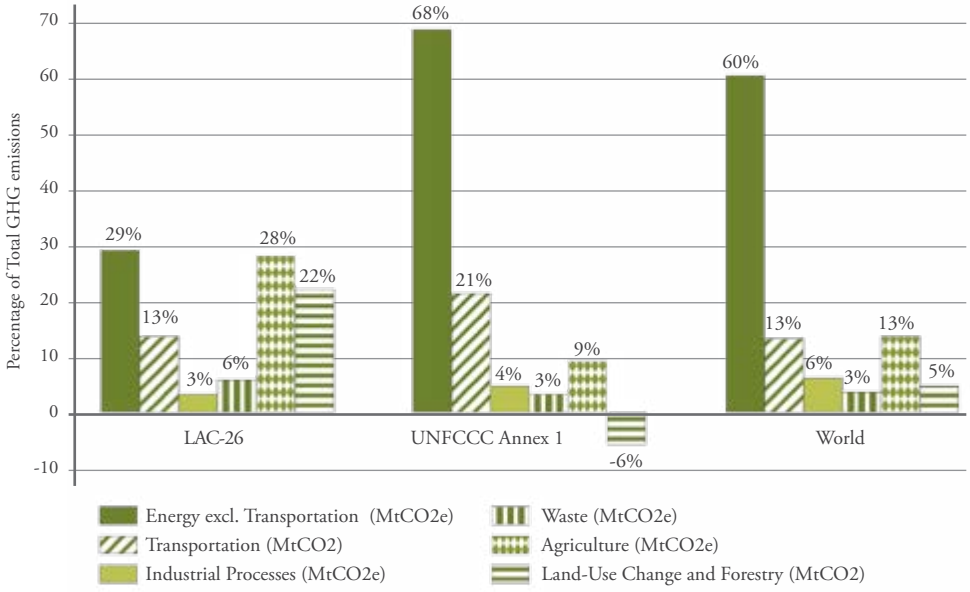

Figure 1:

Emissions profile by sector and by region in 2011

Note: LAC-26=IDB's 26 client countries. Annex I Countries are Parties to the UNFCCC Convention: Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and United States of America.
Source: OVE, based on World Resources Institute 2011.

LAC's electricity matrix is cleaner than those in other world regions, although this is changing. Energy sector emissions have risen sharply, and are expected to continue rising by 132% between 2010 and 2050, close to the expected worldwide rate of 138%. Hydropower has been the main electricity source, but its share has declined from 69% in 1990 to 51% in 2013, while the share of natural gas has increased to 25% (WWI, 2014).[13] Other renewable energy sources (wind, solar, geothermal) account for very little of LAC's electricity, though they have increased recently, reaching 5% of installed power generation capacity in 2013.

Road transport is the main source of CO2 emissions in the transportation sector in LAC, accounting for 93% of total emissions in the sector. Of the total, approximately half comes from passenger transport and half from freight. While public transport and non-motorized modes (walking and biking) account for 70% of travel for passenger transport in cities, there has been a decline in the use of collective modes of

transport in favor of much more carbon-intensive private vehicle use.[14] The situation is exacerbated by poor fuel quality, an aging vehicle fleet,[15] widespread fuel subsidies for transport, and tax breaks on vehicle imports in LAC.[16] Inadequate urban land use planning and growth in incomes and populations have contributed to urban sprawl, increasing the demand for private vehicles, the number of trips per person, and the distances traveled per trip. Among freight modes, the shares of air and road, which are more carbon-intensive than rail and water, have increased because of rising demand for "just in time" deliveries and the increasing density of road networks.

Agriculture and LUCF emissions are concentrated in a few countries. In 2011 four countries—Argentina, Brazil, Colombia, and Mexico—produced 78% of total agricultural emissions, and six countries were responsible for 73% of LUCF emissions: Brazil, Venezuela, Bolivia, Ecuador, Peru, and Paraguay.[17] With regard to world totals, LAC produced 62% of emissions from LUCF. About 90% of LAC agricultural emissions stem from animal husbandry, and only 10% from crop agriculture.[18]

B. LAC's policy agenda to address climate change

LAC countries have increasingly incorporated CC into their national policy agendas. As parties to the UNFCCC and the Kyoto Protocol, all countries in the Region have submitted at least one National Communication on their activities to address CC, and around 70% have published at least two. Several LAC countries are developing and implementing a National Adaptation Plan to reduce climate vulnerability. Furthermore, about a third of the LAC-26 are developing or implementing Nationally Appropriate Mitigation Actions (NAMAs).[19]

In the energy sector, LAC countries appear to be committed to keeping a low-carbon energy matrix. To do this the Region needs to build effective mitigation strategies focusing on both RE and EE/conservation. LAC is well endowed with renewable sources. Besides the wide availability of hydropower, many LAC countries have strong potential to produce electricity through solar, large-scale wind power, and geothermal sources. The Region also has natural gas that can be used during the transition and to support the introduction of RE sources. EE is an alternative to reduce the investment in energy supply while achieving significant reduction in GHG emissions. The IDB estimates that investing in EE would result in a 10% reduction in the consumption of energy over the next decade.[20] Yet high levels of energy subsidies and low resulting electricity prices work against EE and RE policies in LAC (Box 2).

Several transport sector initiatives that reduce both GHG emissions and air pollution have been implemented in the Region: bus fleet renewal in more than 50 cities, import restrictions and emissions standards for used vehicles,[21] vehicle scrapping programs, bus rapid transit systems (BRTSs) and metro systems, and alternative low-carbon vehicle technologies. Vehicle use restrictions ("pico placa") have been applied in some cities,

though they may, in some cases, have had the perverse impact of encouraging some households to buy a second car and actually increase car usage (Gallego et al., 2013). Fuel efficiency standards and pricing mechanisms could lead to large CO2 emission reductions by influencing travel behavior and consumer uptake of more efficient vehicles, but they are not widely adopted in LAC.

In LAC's forest and agriculture sector, CC mitigation policies are largely focused on reducing deforestation and conserving existing forests (avoided deforestation). Brazil has demonstrated that it is feasible to markedly cut GHG emissions by reducing deforestation. Deforestation in the Brazilian Amazon is down to 5,843 km^2 yearly in 2013 from 27,772 km^2 in 2004, and 79% of the Brazilian Amazon forest is still standing today. Little attention has been given to emissions of animal origin in LAC. The agriculture sector can contribute to GHG emission reductions by intensifying crop and pasture systems and thus reducing the need for clearing new land, or by increasing carbon stored in soils. Protecting natural sources of carbon stock requires effective laws, policies, and governance, expanded protected areas, efforts to increase buyers' resistance to unsustainably produced food, and measures that make conservation and use of standing forest more economically attractive than deforestation. Finally, measures to mitigate CC in agriculture may also contribute to climate adaptation.

LAC is beginning to develop adaptation policies in all sectors. The agriculture sector has already being dealing with drought, floods, and excessive heat, and has adapted to varying degrees through choice of crops and growing sites, agronomic practices, and selection of genetic material.[22] LAC has made progress in strengthening disaster risk preparedness. It has advanced less in reducing the underlying risk factors of natural disasters, such as poor urban planning, aging infrastructure, and unsustainable environmental practices and water resource management. In general, the Region lags in developing early warning systems and using knowledge and innovation to build resilience.[23]

Box 2: Energy subsidies in LAC

Because of the subsidies many LAC countries use, the market remains heavily distorted in favor of fossil fuels. According to the IMF (2013), LAC accounts for approximately 5.4% of the global fossil fuel subsidies of US$1.9 trillion, or US$102.6 billion yearly. While well-targeted subsidies can help provide low-income communities with greater access to electricity, widespread and regressive fossil fuel subsidies impose a high fiscal burden. Besides introducing distortions in the energy market, subsidies have fiscal implications. Some countries (e.g., Brazil and Chile) have successfully reduced the burden on their budgets through reforms, but many others continue to provide fuel subsidies. Phasing out subsidies would raise energy prices in the short term, offering higher incentives for RE deployment and EE measures.

Source: IMF, 2013.

About two-fifths of the IDB´s climate adaptation portfolio supported extension services to small- and medium-scale farmers, technology transfer, and agricultural public goods, particularly plant and animal health and crop and animal research and innovation.

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3 Progress on the IDB CC Strategy's Five Lines of Action

The CC Strategy promotes the development and use of a range of financial and nonfinancial instruments for strengthening LAC's institutional, technical, and financial capacity to address CC. This chapter discusses the Bank's progress toward achieving its strategic goals, analyzing trends related to mainstreaming CC mitigation and adaptation in IDB activities before and after the 2011 approval of the CC Strategy. OVE based its assessment on a review of a broad range of institutional documents and corporate databases, and on Bankwide interviews.

A. Developing instruments to mainstream CC in Bank activities

"The Bank will develop instruments to mainstream climate change mitigation in its operations, support comprehensive GHG reporting, and improve climate resilience of the activities it finances" (CC Strategy).

IDB has sought to mainstream CC across its operations and activities. Successful mainstreaming requires that CC be considered, where relevant, in strategy-setting and project design, and that it be facilitated by an organizational structure that promotes cross-sectoral collaboration and learning.

IDB sector strategies and frameworks as a whole give little attention to CC.[24] Because one crucial way of mainstreaming CC is by incorporating climate considerations in IDB's sector strategies, OVE reviewed all the sector strategies mandated by IDB-9 and three climate-relevant Sector Framework Documents

(SFDs): Transport, Agriculture and Natural Resources, and Urban Development. Of the four IDB sector strategies, only the Sustainable Infrastructure strategy mentions CC as a development challenge. As for the SFDs, Agriculture and Natural Resources Management (2013) reflects an extensive review of the empirical evidence on the effectiveness of agricultural development interventions, and its emphasis on public goods, integrated water resource management, irrigation, and rural credit are all relevant for climate adaptation.[25] The Transport SFD (2014) focuses on the concept of sustainable transport in urban areas and freight logistics. Although the Regional Environmental Sustainable Transport Action Plan (2013-2014) proposes to mainstream CC in all its operations, the SFD discusses sustainable transport as a strategy for urban transport. While logistics can have positive CC mitigation co-benefits and road maintenance can improve resilience, these co-benefits are not explicitly highlighted in the strategy (see Annex V). Finally, the Urban Development SFD recognizes that "adequate planning reduces vulnerability to natural disasters and improves urban sustainability," but does not specifically mention possible CC challenges in this regard.

The Bank has increased its focus on CC in CSs since 2009, but this focus has been uneven across the Region, following country demands and priorities. Before 2009 few CSs identified CC either as a priority area or as a potential risk to the implementation of Bank programs. This began to change when Management started to develop Sector Notes on CC to serve as inputs for new strategies.[26] Several recent CSs—Brazil (2012-16), Chile (2011-14), Ecuador (2012-17), Mexico (2013-18), Peru (2012-16), Guyana (2012-2016),[27] and Trinidad and Tobago (2012-16)—have integrated CC as a priority area and have defined clear strategic objectives and expected outcomes in this regard.[28] However, most provide little detail about the exact nature of the challenges associated with CC or explain how the Bank will help countries address them. Moreover, the CSs of some smaller countries that are likely to be seriously affected by CC, especially severe extreme weather events—the Bahamas (2010-2014), Dominican Republic (2010-2013), El Salvador (2010-2014), Honduras (2011-2014), and Panama (2010-2014)—do not consider CC as a strategic issue.

IDB has also sought to mainstream CC by developing best practices for IDB activities and providing learning and capacity-building programs. After the CC Strategy was issued, the Environmental and Safeguard Unit (ESG), in collaboration with sector divisions, drafted specific climate-sensitive guidelines for coal-fired power plants, landfills, cement manufacturing, and liquid gas power plants (see Annex IV); published best practices on chemical plants; carried out research on and developed instruments to analyze project indirect emissions from land use change;[29] and quantified direct GHG emissions from Bank projects, publishing results in the IDB's annual Sustainability Report.[30] OVE's review found some shortcomings in ESG's methodology and its application.[31] Recently, ESG developed procedures and tools to address climate risks in the project cycle, starting with a

screening toolkit for all new projects, which it launched in October 2013.[32] ESG has begun to provide training and direct support to project teams in using the new on-line screening tool, though the tool has not yet been integrated into project risk analysis. The Knowledge and Learning Unit (KNL) has also carried out a number of training activities on CC, including workshops on the implications of CC for the IDB and its Regional member countries.[33] Specific "knowledge platforms" have likewise been developed for adaptation and mitigation. Despite these efforts, interviews suggest that there is limited demand from IDB staff in sector divisions for CC training. Moreover, the proposed knowledge platform on adaptation, unlike that for mitigation, does not have adequate support from the Bank's technical side.

Given the cross-sectoral nature of CC challenges, achieving coordination across sector units is critical for mainstreaming. Over the past years, the IDB has adopted two different organizational arrangements to enhance cross-sectoral coordination in providing CC services.[34] In 2007, the Bank approved the SECCI, financed by trust funds and ordinary capital and coordinated by a "virtual" unit in the Infrastructure (INE) division in VPS. This approach sought to create dynamic partnerships within the INE sectors to promote continuous innovation, knowledge dissemination, and mainstreaming throughout the Bank, reaching the whole spectrum of Bank-financed activities (IDB, 2007). SECCI also aimed to increase the number of qualified personnel working in the different INE divisions. In 2012, a dedicated operational Division for Climate Change and Sustainability (CCS) was created in INE. CC is now incorporated as a more permanent division of the Bank's organizational structure, with its own administrative budget and a greater number of staff,[35] who can also co-manage and participate in pertinent lending operations and technical cooperations (TCs) that involve CC mitigation and adaptation.

Within the IDB, there seems to be a consensus that having a dedicated CC unit can play an important role in CC mainstreaming and in improving coordination, but whether such a unit should have operational responsibilities is more debatable. OVE carried out a number of semi-structured interviews with IDB Management to obtain informed views about the effectiveness of the Bank's present organizational and institutional arrangements for the provision of CC-related support.[36] One of the main conclusions from these interviews is that no matter where a CC unit is located in the Bank's organizational structure, it plays an important role as a cross-sectoral "service" division to support other sector divisions in more effectively mainstreaming CC in their strategies and operations. It is also widely recognized that the Bank's administrative budget arrangements and staff incentives need to be adjusted to better promote and reward such cross-sectoral collaboration (see Box 3). Interviews with sector specialists suggested that having a parallel operational division (in contrast to a support unit) has resulted in tensions with other sector divisions and generated some misunderstanding with country authorities.

Box 3. Promoting cross-sectoral collaboration: double-booking and dedicated support

The Bank has introduced a Bankwide "double-booking" mechanism (IDB, 2012d) that allows two or more divisions to register the same operation as their own when their staff participate in the project team. The VPS division with primary responsibility for the operation receives the standard budget for project preparation, and up to an additional 15% goes to the collaborating division to finance travel costs, supervision, and consultancy services. There are questions whether this mechanism significantly changes incentives; a recent OVE evaluation (RE-451-2, January 2014) found that the division that does not lead the operation has little incentive to "lend" specialists, and that "supervisors, under pressure to approve projects, tend to discourage cross-sector work."

A different approach is to have dedicated units whose role is to support other units rather than to lead lending tasks themselves. This is generally the model for the Bank's Safeguards unit, for example, and for the Gender and Diversity unit as well. Under such a model the unit is expected to provide services to others rather than generate projects. It receives a budget to cover the support costs and is rewarded for its success in providing such support.

The CC unit has shifted between these two models. Originally a support unit implementing TCs mainly financed by SECCI and other climate funds, in 2013 it changed its focus to become a lending unit preparing and implementing policy-based loans and managing climate resources, and more recently it shifted back toward support and mainstreaming. The demand for CCS participation through double-booking has decreased, and collaboration since then has been more informal.

B. Strengthening the knowledge base

"The Bank will focus on building technical capacity and knowledge regarding climate change adaptation and mitigation and sustainable energy, by providing and facilitating guidance, support and knowledge to its clients, as well as to its staff" (CC Strategy).

IDB has been proactive in building a knowledge base on CC issues in LAC, but there is scope to further expand its knowledge on CC. The RES and the CCS, in collaboration with other sector divisions, have produced a variety of CC-related publications, including technical notes, working papers, policy briefs, discussion papers, and monographs that examine CC issues in a broader context. OVE reviewed 40 of the major CC publications produced by CCS and RES between 2004 and 2013 to assess whether they reflected the latest scientific thinking and incorporated the most relevant climate data (Box 4).[37] Approximately 15% of the papers were found to fully reflect and reference the most relevant underlying climate science,[38] 45% to reflect it fairly well,[39] and 40% to reflect it poorly. OVE also found that the main focus of IDB publications was on CC mitigation (e.g., energy, climate financing, and policy), and very little attention was given to adaptation. The assessment also found that, although country-specific evidence and data are broadly available, the IDB publications reference them only sparsely.

Box 4. General assessment criteria for knowledge products

OVE used the following criteria in reviewing the selected material in the IDB's CC knowledge base:

- Demonstrated awareness of scientific background literature on CC, including referencing and use of (i) IPCC reports; (ii) regional scientific inputs; and (iii) other sources of scientifically based climate information.
- Acknowledgement of any existing local/regional climate baselines.
- Overall use or misuse of CC information (the latter through nonscientific citations and quotes without source).
- Overall correctness of the interpretation of available CC information.
- Extent to which information can be used by project teams and is related to the IDB's CC strategy.

Much of IDB's knowledge generation occurs through TC, but the results of these activities are generally not well documented. The IDB has provided knowledge and guidance support to countries through TCs, especially through SECCI (Box 5).[40] Between 2004 and 2013, IDB approved 150 TCs (US$117.8 million) to generate knowledge on CC. The number and amounts of TCs increased significantly in 2013, about doubling those of previous years. These studies focus primarily on mitigation issues, and they have a strong regional content. The agriculture and energy sectors accounted for the largest amounts approved for knowledge-related TCs (42% and 27%, respectively).[41] About three-fifths of the TCs approved for climate-related knowledge generation had regional or subregional coverage. Some of these TCs have promoted regional public goods such as regional climate/environment monitoring systems and statistics.[42] Others have promoted partnerships with international institutions (e.g., the Food and Agriculture Organization, the World Bank, the United Nations Development Program), private sector agents (e.g., farmer organizations, transport unions), national institutions, and academia. Unfortunately, the IDB has neither a repository for studies produced with TC financing nor a monitoring system that assesses the quality and usefulness of these products.

C. Expanding lending and technical assistance in key CC-related sectors

"The Bank will increase its lending and technical assistance programs in climate-sensitive sectors, mainstreaming climate change mitigation and adaptation in the design and implementation of its operations" (CC Strategy).

The Bank does not have an information system that reliably identifies IDB lending and technical assistance projects related to CC. The CC Strategy mentioned that the Bank will develop criteria and indicators to track the CC mitigation and adaptation

Box 5. Examples of SECCI knowledge generation activities

The intensity of CC is increasing the development challenge, and countries require support for generating knowledge for decision-making purposes and for developing low-carbon and climate-resilient technologies and practices. Since 2007, SECCI has been an important source of finance for knowledge generation, financing more than 45 knowledge products (US$26 million) in different sectors.

Examples of CC adaptation knowledge products:

- **Economic studies.** The Bank, in partnership with CEPAL, produced a series of country studies (Argentina, Bolivia, Colombia, Ecuador, Paraguay, and Peru) on the economic impacts of CC. These studies helped countries develop models that can estimate CC impacts under different scenarios. Government officials reported that these studies and the models served as a tool for policy dialogue and decision-making. In Colombia, for example, the study (conducted by the Government) became an important instrument for the prioritization of actions in the National Adaptation Plan and the Low Carbon Development Strategy.
- **Agriculture.** SECCI financed scientific studies to develop climate-resilient crops—e.g., wheat, potatoes, and coffee—through research and development of genotypes with increased tolerance of drought and higher temperatures.
- **Ecosystems.** Studies on CC impacts on important ecosystems such as glaciers in Chile and Peru, coral reefs in Belize and Jamaica, and the Amazon forest in Brazil and Peru.

Examples of CC mitigation knowledge products:

- **Marine energy and geothermal, wind, and solar energy.** SECCI financed various studies to generate knowledge about the potential for alternative renewable energy sources—for example, a study to develop marine energy in Chile, geothermal energy in El Salvador, and wind energy in LAC.
- **Transport.** SECCI conducted a hybrid bus test program in Chile and Colombia to provide data to municipalities about the environmental benefits and costs of this technology.
- **Information platform.** SECCI financed the development of the Energy Innovation Center (EIC), a virtual information platform on RE and EE topics in the Region (www.iadb.org/eic). The platform collects data on energy production and consumption by country with a data analysis tool that allows for data download. The EIC also contains relevant information on energy institutions and regulations by country, and changes over time.

As part of the ongoing Special Programs Evaluation (forthcoming), OVE reviewed and visited a small sample of 15 SECCI projects to analyze effectiveness and use of the TC. Findings show that two-thirds of the knowledge-generation TCs achieved their objectives and 80% delivered their outcomes in a timely manner. Beneficiaries report that in 60% of the cases, the knowledge products were used for policy decisions.

of its own investments and operations, in line with international best practices. In 2012, the Office of Strategic Planning and Development Effectiveness approved guidelines for classifying IDB-9 lending priorities (IDB, 2012b) to allow for consistent classification of projects under one or more lending program priorities. Using these guidelines, the CCS Division established a standard classification for CC projects, but consolidated information from this source was not available during the evaluation period.[43] Therefore, for the purposes of this evaluation, OVE constructed a database of all projects from 2004 to 2013 with specific objectives and/or activities related to CC—either explicitly mentioned in the document or implicitly linked to the kind of activity—in four climate-related sectors: agriculture and natural resources, disaster risk management, energy, and transport.[44] OVE's CC portfolio includes 796 projects with a total approved amount of US$20.7 billion. About half of the portfolio (in amount) is composed of public sector investment loans. Private sector lending accounts for about one-quarter of the portfolio. The Bank also used its policy-based loans (PBLs) to support climate-related activities. PBLs were approved mainly between 2009 and 2011, and accounted for 18% of the portfolio (Table 1). The distribution of projects is fairly uniform across LAC subregions, although their sector focus varies.[45]

Table 1. Analysis of CC portfolio by instrument, 2004-2013

Project type	Instrument	Number of projects	Share of projects (%)	Original approved amount (US$ million)	Share original approved amount (%)
Sovereign guarantee	Investment loan	136	17	11,191.5	54
	Policy-based loan	37	5	3,741.9	18
	Technical cooperation	500	63	379.6	2
	Investment grant	40	5	359.2	2
Non-sovereign guarantee (SCF) *	Loans	66	8	5,015.3	24
	Technical cooperation and investment grant	17	2	18.5	0
	Total	**796**	**100**	**20,706.0**	**100**

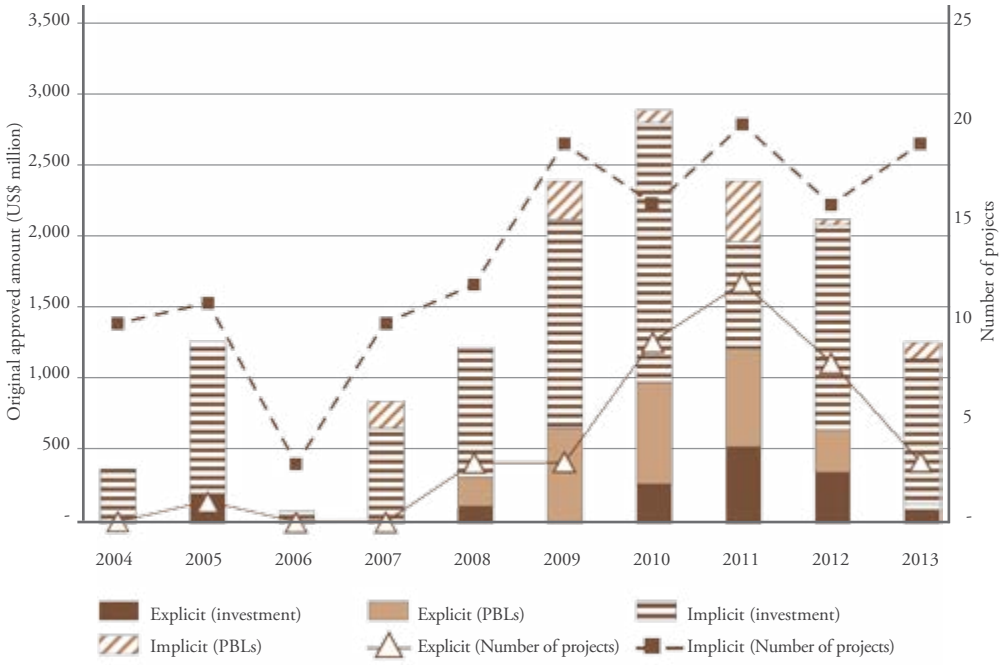
Source: OVE calculations, based on IDB Corporate Database.
Note: * Includes project finance, corporate finance, and green lending operations to financial intermediaries in the energy sector.

About one-quarter of the lending CC portfolio has explicit CC objectives (i.e., to reduce emissions and increase resilience); the remaining loans are focused on non-climate objectives (such as increasing competitiveness or improving access to energy) but have potential CC mitigation or adaptation co-benefits. Strictly speaking, projects with "explicit" climate -related objectives represent only 4% of the IDB portfolio for 2004-2013. Most of these projects have been approved since 2008, and almost two-thirds are PBLs (Figure 2).

FIGURE 2:

CC-related lending by CC contribution, original approved amounts, and number of projects for the public sector*

Note: * Includes only public sector operations. Content analysis is based on Result Frameworks.
Source: OVE calculations, based on IDB Corporate Database.

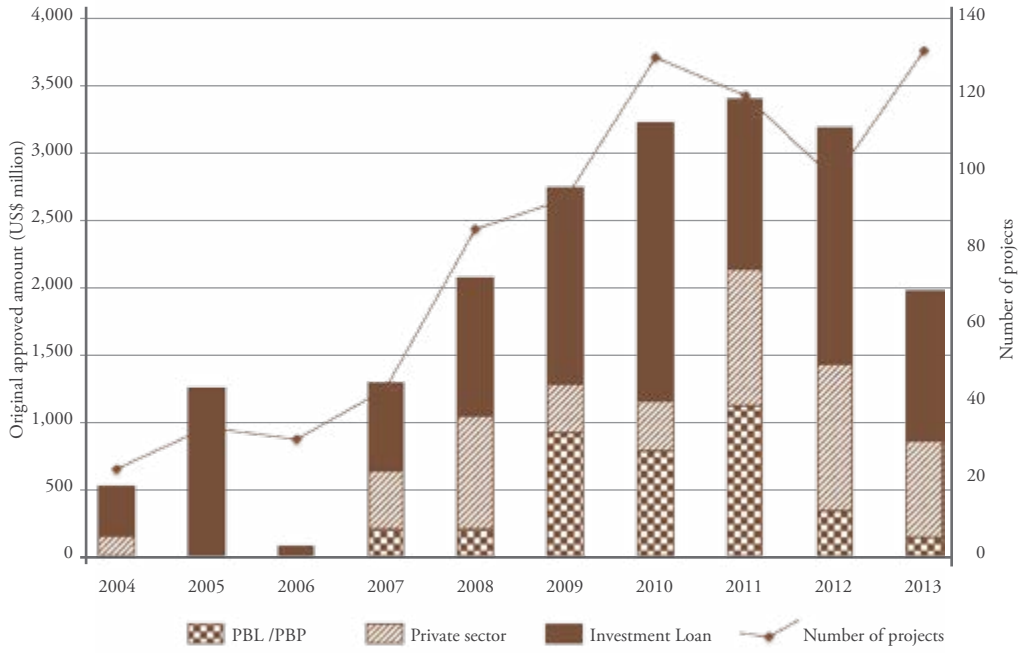


IDB rapidly expanded its climate-related lending in the selected sectors beginning in 2007, reaching a peak of US$3.5 billion (31% of the total IDB portfolio) in 2011. Approved amounts fell somewhat thereafter, to US$2.2 billion in 2013, a level similar to that of 2008 (Figure 3).[46] On average, the CC portfolio represented 19% of the total IDB portfolio from 2004 through 2013. Almost 60% of the portfolio has been disbursed during the period of analysis.[47]

FIGURE 3:

CC lending portfolio by instrument, original approved amounts, and number of projects

Source: OVE calculations, based on IDB Corporate Database.



Almost 70% of the entire CC portfolio is composed of projects with potential CC mitigation co-benefits. Projects with potential CC adaptation co-benefits represent 19% of the total, and the remainder potentially has both CC mitigation and adaptation co-benefits. Projects with CC mitigation co-benefits are predominantly in the energy and transport sectors (70% and 28% of the CC mitigation portfolio, respectively) (Table 2 and Figure 4). Projects with CC adaptation co-benefits are predominantly in the agriculture and natural resources, DRM, and sustainable transport sectors (64%, 19%, and 12% of the total CC adaptation portfolio, respectively) (Table 2 and Figure 4), though the majority of these projects do not explicitly mention adaptation in their program objectives.[48] Projects classified as both adaptation and mitigation include mainly CC PBLs (see section D). OVE also identified projects with activities that may increase GHG emissions (see Chapter IV).

Table 2. Original approved amounts of CC-related projects (loans and TCs) by sector, 2004-2013 (US$ millions)

	DRM	Energy	Transport	Agriculture and natural resources	Cross-sector (CC governance)	Total	Share of original approved amount (%)
Adaptation	778.9	0.8	449.3	2,481.7	208.7	3,919.3	19
Both	0	30.0	177.9	519.9	1,677.5	2,405.2	12
Mitigation	0	10,118.4	4,078.1	170.3	14.6	14,381.5	69
Total	778.9	10,148.2	4,705.3	3,171.9	1,900.8	20,706.0	100

Source: OVE calculations, based on IDB Corporate Database.

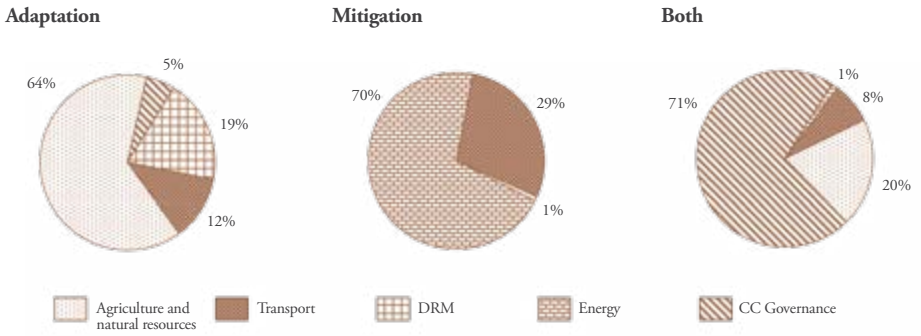


Figure 4:

Mitigation and adaptation projects (loans and TCs) by sector and areas (original approved amounts)

Source: OVE calculations, based on IDB Corporate Database

1. CC mitigation-related portfolio

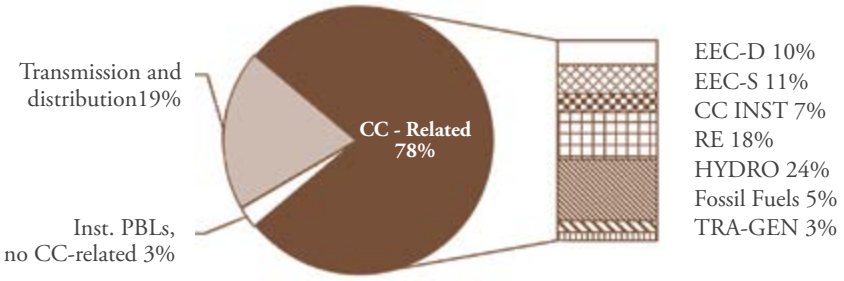
Between 2004 and 2013, projects with potential CC mitigation co-benefits made up almost 80% of the Bank's lending in the energy sector (SG and NSG - SCF).[49] Of this amount, 42% has been directed to RE, 21% to EE (supply and demand), and 7% to PBLs for sustainable energy. In addition, 5% of the resources were directed to fossil fuel projects (oil and gas), and 3% to thermoelectric power plants (coal and gas) (Figure 5); these projects may increase GHG emissions.

The Bank has diversified its energy portfolio from traditional energy supply to new RE and EE operations and is channeling an increasing percentage of its financing through private sector operations. Between 2004 and 2008, traditional energy supply (mainly rehabilitation of existing power plants and transmission and distribution lines) and new large hydroelectric projects represented close to 74% of the lending program; this share fell to 39% between 2009 and 2013. Although new large hydroelectricity projects accounted for more than half of RE lending, the Bank financed more wind energy projects (11) than hydroelectric power plants (9). Direct investments in solar, small hydro, and geothermal power plants were relatively small. Of the total funds approved in the energy sector, 45% (US$4.1 billion in 54 operations) were private sector operations, mainly in RE and EE. Finally, the Bank has used PBLs (CC INST) to support programs aimed at overcoming regulatory and institutional barriers to the use of sustainable energy (see Figure 5).

Figure 5:

IDB's energy financing by area of intervention, 2004-2013 (Total: US$11.74 billion, 132 loans)

Source: OVE calculations, based on IDB Corporate Database.
Note: EEC-D = energy efficiency and conservation in the demand for energy, EEC-S = energy efficiency and conservation in the supply of energy, CC INST = CC-related energy institutional operation, RE = new renewable energy, Hydro = hydroelectricity, fossil fuels = oil and gas, TRA-GEN = traditional energy operations in electricity generation (coal and gas).



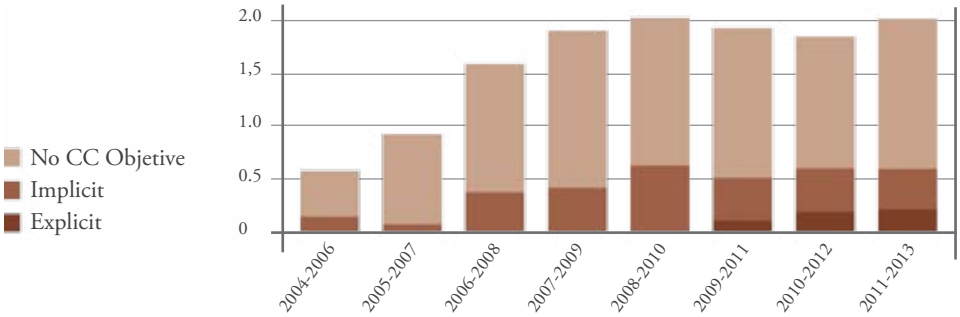
In the transport sector, the total share of CC-related operations represented one-third of the resources approved for the sector, with most CC-related loans (94%) financing activities related to CC mitigation. Of the 125 transport loans approved between 2004 and 2013,[50] 41 have either explicit (12) or implicit (29) climate-related objectives. Public sector investment loans represent 83% and loans to the private sector 10%, of the portfolio. The number and amounts of CC-related loans rose steadily from 2006-2010, reaching nearly 30% of total transport lending, and then plateaued in subsequent years (see Figure 6). The transport CC mitigation portfolio expanded beyond the initial set of BRTS projects to include improvement of traditional bus systems and metros and multimodal integration of freight transportation projects, all of which enhance the efficient use of existing infrastructure. Most mitigation projects include strategies to "shift" toward more sustainable models (21 projects) or to improve technologies and systems (25 projects).[51]

IDB's mitigation-related CC portfolio in agriculture and natural resources (including forestry and livestock) is relatively small (US$170 million, or 1%), considering the large contribution of these sectors to GHG emissions in LAC.[52] There has been modest support for forest conservation and promotion of sustainable practices to avoid deforestation.[53] The most important IDB program to support forest conservation and promote sustainable practices was the implementation of a regional development plan promoting sustainable use of forest resources in Acre (US$91 million, BR-L1289). In addition, the IDB has financed a few agriculture initiatives to promote the adoption of technologies that reduce GHG emissions and increase productivity.[54] However, the IDB has a relatively small portfolio addressing the Region's mitigation needs in agriculture.

Figure 6

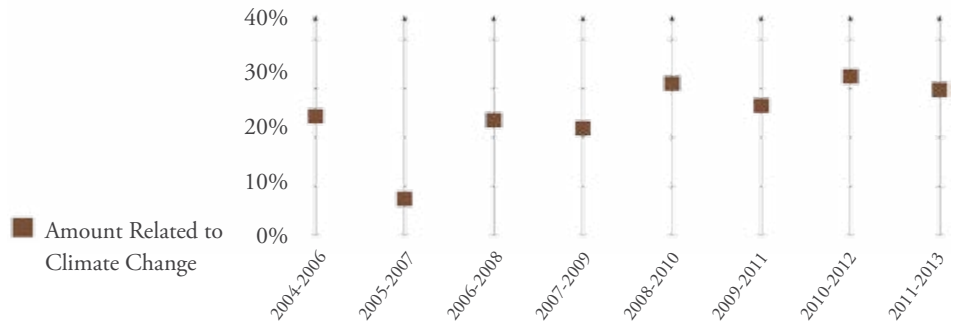
CC-related loans to the transport sector, 2004-2013

Transport Portfolio by Component
(by type of objective, in billions of US dollars)

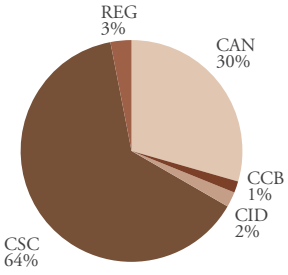


Note: Graphs show 3 year moving averages to illustrate trends.

Climate Change as a Percentage of the Total Transport Portfolio
(amount by component related to climate change as percentage of the total approved amount)



Portfolio by Region
(percentage of total related to Climate Change)



41 loan operations
number of loans related to Climate Change

US$ 3.987 billion total amount of components related to Climate Change

27% of total approved amount

94% related to mitigation

72% percentage that represent loans to: Argentina, Brasil, and Colombia

2. CC adaptation-related portfolio

Most CC adaptation-related projects are in the agriculture and natural resources sector and have been directed toward agriculture extension and water management. About two-fifths supported extension services to small- and medium-scale farmers, technology transfer, and agricultural public goods, particularly plant and animal health and crop and animal research and innovation. Another 37% supported water resource management, including irrigation infrastructure and water management strategies.[55] The rest of the portfolio supported regional development and/or governance, including through programmatic PBLs to strengthen environmental governance and overcome institutional constraints to improving agricultural productivity.

The DRM portfolio is a relatively small part of IDB's total climate-related financing for adaptation. DRM lending has increased since 2010 with the approval of PBLs supporting DRM governance (5 PBLs) and a few investment loans (20).[56] TCs are the most common instruments for addressing DRM in the Region. Contingency loans represent the highest share in terms of approved amounts (50% of the total resources dedicated to DRM in 7 projects), though none of these loans has yet been disbursed.

IDB projects with CC adaptation co-benefits in other sectors have been limited. In transport, CC adaptation interventions accounted for around 10% of the climate-related operations in the portfolio. These projects focused primarily on strengthening road and rail infrastructure by undertaking complementary works or improving technical specifications.

3. Climate-related TC and concessional funds

CC-related TCs increased significantly in recent years and have been used for knowledge generation, institutional strengthening, project preparation, and pilot projects.[57] Climate-related TCs represented almost a quarter of the total IDB resources approved for TCs between 2004 and 2013 (see Table 3), increasing from US$2.3 million in 2004 to US$104.4 million in 2013. The average amount also increased from less than US$0.2 million in 2004 to US$1.1 million in 2012 and 2013 (Figure 7).[58] The agriculture and natural resources and energy sectors have the largest numbers of TCs. DRM TCs have the smallest average size; they are mostly emergency TCs approved after a natural disaster. Agriculture uses TCs mostly for knowledge generation, especially regional (i.e., biodiversity and agriculture research), while transport uses them mostly for project preparation.

Table 3. TCs by type of activity, 2004-2013

Category	Number of projects	%	Approved amount (US$ million)	%
Project preparation	106	21	80.2	21
Stand-alone pilot projects	114	23	68.0	18
Institutional strengthening	130	26	112.1	30
Knowledge generation	150	30	119.3	31
Grand total	**500**	**100**	**379.6**	**100**

Source: OVE calculations, based on IDB Corporate Database. Note: * Includes project finance, corporate finance, and green lending operations to financial intermediaries in the energy sector.

Almost 50% of the climate-related TC portfolio was financed with the Bank's ordinary capital. Other sources of financing, around 5% each, are the Nordic Development Fund, the SECCI Multi-Donor Trust Fund, the Canadian International Development Agency, and the Global Environment Facility (GEF).

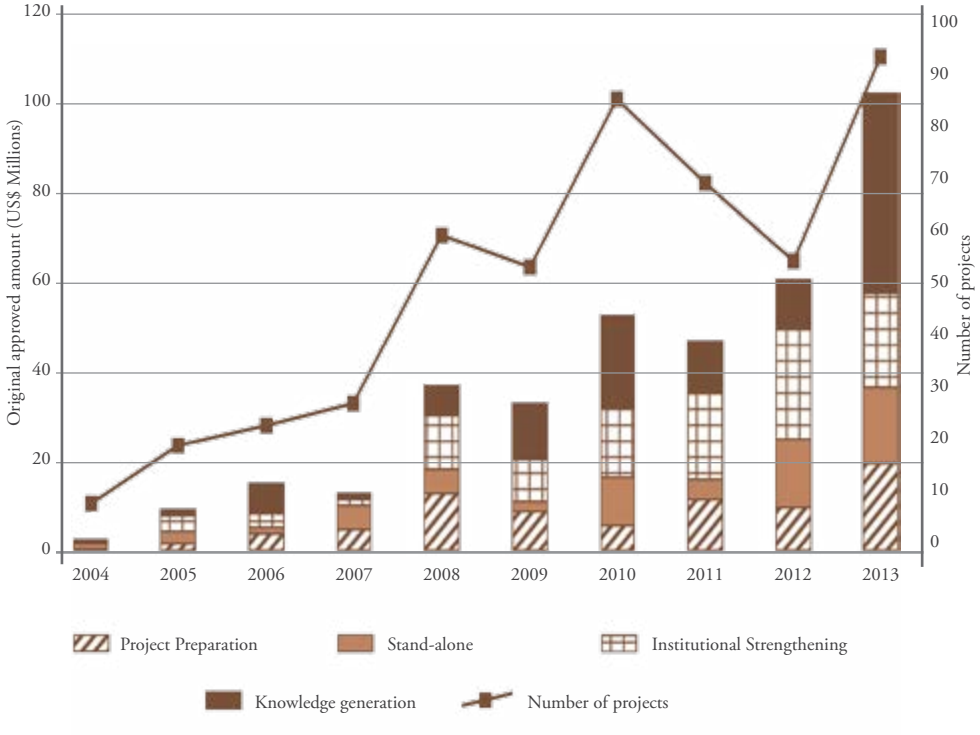


Figure 7:

TC by type or activity by year, 2004-2013

Source: OVE calculations, based on IDB Corporate Database.

The IDB also approved operations financed by the Climate Investment Funds (CIF) (see Box 6).

D. Strengthening institutions and institutional frameworks

"The Bank will leverage its unique position in the Region to strengthen institutional frameworks to better respond to climate change and sustainable energy challenges" (CC Strategy).

LAC countries are building capacity and institutional frameworks to effectively address CC. IDB has used mainly PBLs and TCs[60] to support countries in designing and implementing national CC policies. Between 2007 and 2013, the IDB approved 16 climate-related PBL (CC PBL)[61] programs in nine countries—26 operations for a total of US$3 billion—representing around 20% of all Bank PBLs. Of the 16 PBLs, 13 were programmatic. OVE reviewed a sample of six CC PBL programs (12 operations) in five countries,[62] and the evaluation found the following:

- The CC PBLs were more focused on commitments to strengthen institutional arrangements (i.e., strengthening CC units within public institutions) and the knowledge base (i.e., collecting information for policy decision-making) than on actually supporting policy changes or reforms (i.e., designing or approving new CC legislation).[63]

Box 6. Summary of findings from the Independent Evaluation of the Climate Investment Funds (http://www.cifevaluation.org)

The CIF were established in 2008.[59] The CIF comprises two trust funds namely the mitigation-focused Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF). The SCF comprises three programs: Pilot Program for Climate Resilience (PPCR), the Forest Investment Program (FIP), and the Scaling up Renewable Energy Program (SREP). Different Donors have pledged round $8 billion to the CIF, and hence making it the largest among the different climate funds. The CIF operates through the MDBs—African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, The IDB, and World Bank Group. The CIF rely on the MDBs *for implementation,[a] a programmatic approach to investment planning, an aim of inducing transformational change, and an emphasis on private sector engagement* (CIF evaluation 2014).

Between July 2008 and December 2013, the IDB approved 11 CIF operations (US$285 million) in four countries (Brazil, Colombia, Honduras, and Mexico,). Implementation is still at an early stage, with overall CIF disbursement representing about 9% of the endorsed funding.[b]

An independent evaluation of the CIF[c] found overall that (source CIF evaluation 2014):

- *Implementation progress of CIF projects has often been slow.*
- *CTF investment plans have tended to implement relatively rapidly compared with SCF. CTF plans are prepared by middle-income countries, typically involve less stakeholder consultation than SCF, and focus on a limited number of sectors.*
- *In contrast, three-quarters of PPCR recipients and half of FIP recipients have not met indicative timelines for investment plan preparation.*
- *Transformative impact is a major goal of the CIF, and a justifiable one, yet the goal of transformation has not been consistently pursued. Some CIF projects were clearly transformational in design—for instance, the combined CTF investments in concentrated solar power that could help reduce the cost of this technology, and FIP investment plans in Mexico that chart a path towards transformed forest management. However, many CTF plans and projects lack a convincing theory of change that explains how replication and broader uptake will be achieved.*
- *The CIFs recognized the importance of the private sector in scaling up CC mitigation and adaptation activities. Several factors dampened the direct provision of funds to the private sector: government-led investment planning processes tended to prioritize public over private investments; the length of the investment planning process diminished private sector interest; and CIFs did not utilize the full range of available financial instruments (such as equity investments) to support high-risk, high-return investments.*

[a] The CIF rely on the MDBs for supervision, quality control, fiduciary controls, safeguards, and accountability at the project level.

[b] Since the CIF are less than 6 years old the independent evaluation was primarily formative.

[c] The ICF International team conducted this evaluation; the five Independent Evaluation Departments of the MDBs established an Evaluation Oversight Committee to manage and oversee the evaluation; and an International Reference Group provided independent review by a diverse and respected set of experts.

- They had complex policy matrixes with large numbers of commitments and triggers, but half of these commitments were quite weak in terms of the proposed policy changes.[64]

- Flexibility in programmatic CC PBLs often resulted in changes from the original commitments to less ambitious ones.

- In programmatic series, some second and third operations were not approved, leaving the planned reform process incomplete and challenging the long-term commitment of IDB and governments.[65]

- Monitoring reports were weak, particularly for unfinished programs.

- Governments claim that CC PBLs and the associated policy dialogue helped to push the CC agenda, especially in Ministries of Finance, and provided continuity to the reform process despite changes in government. TCs related to PBLs are also perceived as helping to sustain the policy dialogue.

IDB has also used TCs to provide institutional strengthening to national and subnational governments, focusing mainly on supporting policy planning and building institutional capacity. These TCs account for one-third of the total approved amounts of climate-related TCs approved between 2004 and 2013. Half of these TCs are implemented by national governments, subnational governments account for 24%, and the rest are regional TCs. For policy planning activities, the Bank has supported countries mainly in setting up national strategies and sectoral plans and developing mechanisms to support policies and programs. In the capacity-building category, the IDB has helped countries strengthen their technical expertise and their analytical, strategic, and regulatory capabilities. As mentioned above, TC results are not very well documented at the IDB.

E. Leveraging private sector investment

"The Bank will develop financial mechanisms that will allow for the scaling up of investments, addressing of financial gaps and leveraging private sector investments" (CC Strategy).

IDB proposed to use Bank resources to leverage international funds and scale up climate-related operations in the private sector. Management was encouraged to place more emphasis on three areas related to the private sector: (i) developing a specific approach to guide IDB's private sector involvement in energy production, (ii) defining the Bank's role in financing fossil fuels, and (iii) analyzing regulatory regimes, pricing, and subsidies in the energy sector.[66]

In practice, an increasing percentage of the Bank's financing in the energy sector has been channeled through its private sector window (SCF). As mentioned above, private sector operations represented 45% of the CC portfolio in energy and increased rapidly

LAC countries are building capacity and institutional frameworks to effectively address climate change policies.

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after 2011. Private sector operations have focused on RE—hydro, wind and solar—mirroring the nature of the LAC electricity industry, which has important private participation in RE generation. The total installed capacity of the electricity generation projects financed by the IDB's private sector (both traditional and renewables) reached 4,653 MW, mostly concentrated in hydro and wind power investments. The lion's share of the installed capacity went to hydropower (49% of all the MW installed by IDB projects), followed by wind energy generation (33%) and coal-powered stations (15%). The portfolio was completed by solar (1%) and geothermal (1%). Most of the portfolio was concentrated in a small number of countries.[67] IDB produced clear guidelines for coal-fueled power plants and projects in other environmentally sensitive sectors. The definition of the Bank's role in supporting regulatory regimes (including pricing and subsidies) has been less clear.

The IDB has also sought to leverage concessional funds to compensate for CC externalities. In its SG portfolio, the IDB started to use credit lines (CCLIPs) and TC resources combined with concessional resources from the CIF, as shown in Box 7. In the case of the private sector (SCF), OVE considers that if the Bank's main motivation in financing private sector operations is to address CC externalities, the Bank may want to leverage more concessional funds to compensate investors for the fact that they cannot capture all the benefits they produce for society. Except for the CTF and the Canadian Climate Fund, the IDB has few concessional funds available for private sector lending. Only two operations in the portfolio evaluated by OVE received concessional funds from the CTF and the Canadian Climate Fund—a wind power farm in Mexico and a solar power park in Chile. Two other projects received funds from the GEF and the Nordic Development Fund.[68]

Box 7. The use of concessional resources in SG operations

One innovative intervention related to energy efficiency is the creation of the green initiative in Colombia, although its effectiveness is still uncertain since it has not yet been implemented. The Bank had an important role in the design and funding of the Colombian green initiative, financing two TCs associated with it (CO-T1332 and CO-T1328) to design financing lines and to identify priority areas for investment and bottlenecks and barriers that could inhibit private investment in energy efficiency improvements. The green initiative is financed with a CCLIP line and complemented by an operation financed with CTF concessional funds (CO-L1124, US$10 million) that will reduce the cost of the financing and/or compensate for the increased transaction costs. The goal of this program is to support Colombia's actions to improve the competitiveness of the hotel, clinic, and hospital subsectors, while reducing GHG emissions. The project design incorporates two new processes that address the barriers that inhibit private investments in this area. First, it will reduce the costs of audits by incorporating preliminary designs of six technologies identified to produce greater energy savings in hotels, clinics, and hospitals. Second, it will incorporate an insurance company that guarantees the proposed savings in the audit; if they are not reached, it would cover the potential loss.

In Mexico, the Bank had partially financed renewable energy projects in the private sector for approximately US$250 million, using a credit line (CCLIP) with sovereign guarantee. The Renewable Energies Program uses CTF concessional funds to leverage financing from both IDB and NAFIN. The Mexico CCLIP was originally designed to provide funds to small and medium enterprises (SMEs), with very little for renewable energy. The low demand for SMEs' products, the favorable environment for the development of renewable energy projects, and the leverage of the CTF changed the main focus of the CCLIP line, and the third tranche of the operation was fully devoted to financing renewable energies.

The potential for co-benefits in terms of CC mitigation and other policy goals is particularly strong in the energy sector. OVE found that the Bank has been most effective in the energy sector when its public sector engagement and dialogue and its private investments have been closely aligned with the country's own energy strategy.

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4 Results of IDB Support for CC Mitigation in Selected Sectors

This chapter discusses evidence gathered by OVE on the results of IDB's CC portfolio in supporting projects with potential CC mitigation co-benefits. It focuses on the three sectors where potential CC mitigation co-benefits are greatest: energy, transport, and agriculture and natural resources.[69] The evaluation's CC portfolio includes both operations with explicit CC objectives and those without explicit objectives but with clear potential to affect GHG emissions (Box 8). This reflects the fact that many IDB interventions can serve multiple purposes, addressing important development challenges while having substantial co-benefits in reduced GHG emissions.

Box 8. Evaluated portfolio

Energy. OVE reviewed a sample of 45 projects—19 public sector interventions (44% of the entire SG portfolio) and 26 private sector interventions (49% of the entire NSG-SCF portfolio), both broadly representative of the Bank's different intervention strategies. OVE interviewed project specialists (origination and monitoring) for 37 projects and visited 26 clients in the countries. In addition, OVE commissioned a full report on the development of the RE market in LAC.

Transport. OVE reviewed a sample of 20 projects (50% of the climate-related portfolio): 7 urban mass transport projects (8 loans); 11 road, rail, or logistics infrastructure projects; and 1 institutional reform project (PBL). Of the 20 projects, 2 were NSG operations (a metro and a beltway). The team visited 11 of the 20 projects. In addition, OVE commissioned an assessment of the CO2 estimated emissions of a sub-sample of transport projects.

Natural resources (forestry). OVE reviewed a sample of four of the nine loans approved for forestry in the evaluation period as illustrative cases in Brazil, Argentina, Guatemala, and Mexico. The forestry portfolio also includes more than 50 TCs and investment grants that were not assessed in depth in this evaluation.

To date, the Bank's biggest impacts on climate change mitigation have likely been through its support for renewable energy, mainly hydropower.

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It is important to emphasize that the IDB's measurement of climate-related results at the project level has been highly deficient. In practice, most public sector projects with explicit CC objectives included climate-related mitigation indicators (i.e., GHG emissions reduction) in their results frameworks, but very few set targets or measured progress against these indicators.[70] In the private sector, although CC mitigation has often been cited as a justification for an investment, most operations have not specified climate-related indicators to measure results. Thus the findings reported in this evaluation are based on ex post analysis and project field visits by OVE.

A. Energy

The potential for co-benefits in terms of CC mitigation and other policy goals is particularly strong in the energy sector:

- GHG mitigation strategies can support countries' efforts to reduce their vulnerability to international oil prices. By using more renewable energy, countries can reduce the fiscal vulnerabilities associated with variations in international oil prices while keeping a low-carbon electricity matrix as a co-benefit.

- Adding various renewable energy sources can increase the robustness of the power system. High dependence on hydropower carries long-term challenges and vulnerabilities. Diversification with low-carbon sources can broaden the electricity matrix and decrease the risks of system failures due to water deficits in times of drought.

- RE can help meet electricity demand in rural and isolated areas. New renewable sources can be technologically and economically feasible in such areas.

- EE can boost competitiveness and reduce investment in energy supply while achieving reduction in GHG emissions. IDB has estimated that the Region could reduce its energy consumption by 10% over the next decades by adopting existing technologies to increase efficiency and reduce new investments.

- Early introduction of RE can help countries and companies develop a comparative advantage in low-carbon technologies. This strategy has been successfully followed by Brazil in wind energy and is under way in Mexico.

- The introduction of RE and EE allows countries to gain access to concessional resources associated with GHG mitigation activities. Funds such as the CTF, the Special Climate Change Fund, and the GEF Trust Fund have provided LAC countries with concessional resources to compensate for the incremental costs of low-carbon development.

Overall, OVE found that the Bank has been most effective in the energy sector when its public sector engagement and dialogue and its private investments have been closely aligned with the country's own energy strategy. A good example is the Bank's support for wind farms in the context of the Uruguayan energy reform. The Bank's support—financing the first three large-scale renewable energy projects—contributed to the development of a broader environment for private sector investments in energy, and coordination between the public and private sector windows of the IDB contributed to align all actors. In contrast, the Bank's support for wind farms in Mexico was carried out without reference to broader energy strategy of the country or the Bank's policy dialogue. These projects are facing significant operational, technical, and environmental challenges. In addition, if the recent energy reform succeeds in reducing hydrocarbon prices and thus electricity prices, it may affect IDB wind-farms operations in Mexico.

IDB support for regulatory and institutional reforms tends to be more effective if it is part of a win-win strategy with the government, aiming at transforming the energy matrix and not just tackling fiscal issues. The IDB used "sustainable energy" PBLs to support institutional and regulatory development. Most PBLs were approved in Central America and the Caribbean, and in almost all cases the promotion of a new energy matrix was strongly associated with the goal of reducing the country's

vulnerability to the price of imported fossil fuels. PBLs have been more effective when they related to broader energy policy objectives (Barbados, El Salvador,[71] Nicaragua) rather than just to addressing pressing fiscal needs (Panama and Trinidad and Tobago). The Bank's PBL operation in Peru, the most ambitious and comprehensive of all, opened new spaces for dialogue on relevant energy policies and regulations; however, its role in promoting a greener energy matrix has been less visible.

To date, the Bank's biggest impacts on CC mitigation have likely been through its support for RE, mainly hydropower. The Bank has supported the development of four hydropower plants: Miscuni in Bolivia (80 MW), Porce III in Colombia (660 MW), Reventazón in Costa Rica (319 MW), and Tocoma in Venezuela (2,160 MW). OVE estimated that these projects will generate a total of 17,000 GWh per year, which would potentially allow mitigation of 4.1 million tCO_2/year.[72] One of the most coherent RE interventions, with a clear orientation toward CC mitigation, has been in Nicaragua,[73] where Bank support has aimed at improving the sector's institutional set-up, increasing efficiency, and incorporating new renewable sources, all of which are expected to reduce the vulnerability and increase the security of the power system. As a co-benefit, these changes are likely to reduce the country's carbon footprint.[74]

On the private sector side, the Bank financed a significant share of the new RE generation in the Region. SCF has financed 16% of new RE generation (total 1,652 MW) for LAC in 2004-2011. Excluding the projects in Brazil, the picture changes dramatically: the contribution of the Bank in hydropower rises to 22% of the installed capacity in the Region, and 58% of the investments in RE. Wind power leads the RE portfolio with 12 projects totaling US$787 million, or roughly 19% of the amounts approved, heavily concentrated in Mexico, Uruguay, and the Dominican Republic. Hydropower follows with six projects and about 18% of the approved amounts. Solar power adds another three projects for 3% of total approvals, mostly concentrated in the Atacama Desert.

It should also be noted that some of these projects have important environmental risks, and their value-added has sometimes been compromised. Despite the use of the terms *green energy* or *clean energy*, new RE sources typically have significant environmental and social effects that need to be dealt with effectively. The fact that a technology is good for CC does not necessarily mean that it is environmentally friendly in general, and some of the "green projects" in the portfolio have posed environmental risks that have not always been effectively mitigated (Box 9). Although most SCF projects were successful in providing long-term financing and complied with the good-practice standards (GPS) in terms of financial and nonfinancial additionality, OVE considers that the financial value-added of SCF could be further improved,[75] in particular, in the few refinanced wind farms projects.[76] In contrast, the environmental safeguards and the IDB's relationship with governments have been mentioned as a source of nonfinancial value-added. Most of the clients and stakeholders interviewed by OVE highlighted the value of Bank safeguards, both to help develop sustainable practices at the firm level

and to ensure that firms comply with internationally recognized environmental and social standards. IDB also added value through its privileged access to the government; some clients appreciated having a partner with direct dialogue with governments.

Box 9. Some environmental and social risks in RE projects

Environmental risks associated with wind farms include high bird and bat fatalities, and geothermal energy may entail health hazards associated with heavy metals (e.g., mercury) or fugitive emissions (see, e.g., Kagel et al., 2005). In most renewable technologies, and particularly those that use a lot of surface area (e.g., solar), the issue of land rights is also important. The environmental and social risks of projects typically depend on project locations.

A few RE projects financed have posed environmental risks that have not always been effectively mitigated—in particular, the IDB-sponsored loans to wind farms in Mexico that were located in bird migration routes. As a consequence, bird fatalities reached a figure as high as 30 times that of comparable wind projects. Though the Bank's safeguard unit correctly identified the risks of these operations, the problem has not been effectively mitigated yet: the emergency shut-down procedures agreed have not been implemented by the clients, and further studies on bird and bat fatalities are still to be completed. Moreover, the safeguard performance of these two projects has been labeled as *unsatisfactory.*

Large-scale introduction of new RE requires base load generation capacity, which will require further investments in traditional sources. Since fossil-fuel-based generation provides a source of dispatchable power, offsetting the inherent intermittency of renewable sources. For instance, in Uruguay, where the Bank is financing several wind farms, it is also supporting the expansion of traditional generation. Through the public sector window, the Bank is financing the 530 MW Punta del Tigre combined-cycle power plant, which will increase installed capacity by 20%, thereby providing robustness to the grid.[77] Moreover, GHG emissions from this natural gas plant are expected to be 26% lower than those of diesel-based plants (0.39 vs 0.53 tCO_2/MWh).

Ensuring emissions reduction and adequate compensating measures in traditional fossil-fuel-based generation may also represent an opportunity for IDB. The Bank has some experience in efficiency and compensation measures through financing one coal-powered thermoelectric plant in Brazil in 2009. The intervention provided a useful learning experience that led to the definition of IDB guidelines and eligibility requirements for environmentally sensitive projects. Moreover, in an original and unprecedented approach, the operation required the sponsors of the plant to compensate for the additional GHG emissions associated with the use of a suboptimal technology. In total, the sponsors agreed to offset 320,000 tons of CO_2eq either with their own projects or through the carbon markets. These mitigation measures were sizable—almost equal to the GHG emissions mitigated by the largest wind-farm financed by the Bank in LAC.[78]

While most investments in transport infrastructure seek to reduce transportation costs, facilitate trade, and improve the reliability and efficiency of networks, incorporating climate change considerations through sustainable transport approaches can generate such important co-benefits as improvements in air quality, traffic safety, and increased mobility and access to goods and services.

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The Bank has contributed to improving the EE of power supply, with a focus on rehabilitating hydropower and investing in transmission and distribution networks to reduce losses. Reducing energy losses through investments in transmission and distribution networks has been challenging, and the net effect of these programs on emissions is unclear because of the limited impact the interventions have on total electricity grid losses. In contrast, rehabilitating hydropower plants has been a more effective and clearly quantifiable approach to mitigating GHG emissions. The Bank financed the rehabilitation of four large hydropower plants to restore capacity and efficiency. According to project documents and OVE's calculations, at the conclusion of these four projects, a total of 922.6 MW of clean energy will be recovered[79] and a total of 1.1 million tCO_2 emissions per year will be avoided by not generating that electricity in thermal plants.

The Bank's contribution to increasing EE on the demand side has been modest, and it is too early to assess its effectiveness. The most innovative public sector intervention has been the creation of the green initiative in Colombia,[80] which is still in the early stages (Box 7). The private sector (SCF) has financed 12 projects for US$561 million for the adoption of technologies that lead to end-user energy savings. These projects include the promotion of sustainable solutions

for households and business facilities (particularly in the tourism sector), and the adoption of cleaner industrial technologies. It is too early to measure results, although there are early signs of efficiency gains, largely concentrated in big and highly profitable projects.[81] SCF has also approved credit lines to financial intermediaries for climate-related on-lending, particularly EE. Box 10 summarizes preliminary findings.

Box 10. Green lending operations

In addition to 53 SCF infrastructure and corporate finance projects related to CC, OVE partially reviewed 16 SCF operations with financial intermediaries that are also related to the promotion of RE and EE investments. These operations seek to expand the availability of local financing to private sector firms developing green projects. They are, for the most part, credit lines to local banks (14 operations in 11 countries, for a total of $497.5 million). The remaining two operations are guarantees (one in Colombia and one in Brazil), totaling $157 million.

Green lending operations are currently the Bank's most common instrument for EE projects. EE projects are often small, and Bank direct lending is not cost-efficient in these circumstances. Preliminary findings suggest that these projects have generally allowed local banks to expand the size of their green portfolios, although the fungibility of money makes a precise quantification of the effect challenging. As expected, given the high transaction cost of developing EE projects (due to the need for energy audits in particular), the success of these projects in expanding the availability of financing for micro and small firms has been limited.

OVE is currently working on a stand-alone evaluation of these green lending operations (forthcoming).

Finally, the Bank's work has contributed to the knowledge base in the Region, with emphasis on the barriers and challenges faced by the energy sector. Knowledge products helped to identify and propose solutions to technological and institutional barriers and to develop new energy technologies. For example, the Bank has supported the UN's global initiative Sustainable Energy for All in LAC. The Climate Scope (MIF, 2013) provides institutional development information about the energy sector in all countries. The Bank has financed studies and pilot projects in new technologies such as smart grids (in Colombia, Ecuador, and Regional), marine energy (in Chile), and large-scale solar power (Atacama's large solar power development in Chile), contributing to generating capacity, knowledge, and new investments throughout the Region.

B. Transport

Transport is a critical sector for economic development, linking people with goods and services, but it can also have negative impacts, including traffic congestion and accidents and air and noise pollution. While most investments in transport

infrastructure seek to reduce transportation costs, facilitate trade, and improve the reliability and efficiency of networks, incorporating CC considerations through sustainable transport approaches can generate such important co-benefits as improvements in air quality, traffic safety, and increased mobility and access to goods and services. Additionally, building transport infrastructure that is more resilient to climate change may lead to increased economic returns on investments.

The extent to which CC concerns have been mainstreamed into the strategic and project levels in the transport sector has been uneven. The CC Strategy recognized the importance of promoting sustainable low-carbon transportation solutions for passengers and freight, in both urban and rural settings. The transport sector incorporated this vision into its key strategic documents and sector framework, although with different emphasis. In the REST-Action Plan[82] the Bank further developed the notion of sustainable transport agreed on by the IDB and other MDBs at Rio+20[83] and defined ways to incorporate it into projects[84] by adopting the *Avoid-Shift-Improve* model for all IDB-financed transport operations (roads, urban transport, freight, and logistics). In contrast, while the SFD includes the promotion of efficient logistics networks, the lines of action in the sustainable transport dimension focus only on *urban* transport.[85] Given that freight and interurban transport contribute to a significant share of GHG and local pollutants in LAC (approximately 50%), not explicitly focusing on lines of action to reduce emissions from freight represents a missed opportunity to integrate the consideration of CC mitigation into IDB's freight operations.[86] At the portfolio level, only 33% of transport lending integrates CC concerns (either explicitly in the objectives or implicitly in the activities), mostly focusing on reducing GHG emissions. CC mitigation was a more dominant theme in TCs than in lending: nearly 50% of the TCs approved over the period were climate-related, mostly focused on mitigation (92%).

The seven IDB urban mass transport projects reviewed by OVE generally sought to address key urban mobility problems, such as inefficient and aging public transport systems, traffic accidents, and congestion, as well as to reduce local and GHG emissions as co-benefits. In most of these projects the Bank supported interventions to improve the efficiency of existing systems and/or shift trips toward more sustainable modes by providing new or rehabilitated infrastructure (supply-side interventions) and optimizing public service routes to improve public transportation and promote multimodal formats (pedestrian and bicycle routes). Some projects (two of four BRTS projects) also included complementary measures to improve the vehicle and system technologies through vehicle scrapping and upgrading, route optimizations, and intelligent transport systems. However, these projects have not generally included demand-side measures to discourage single-occupancy motorized trips as part of their design.[87]

OVE estimated emissions benefits for four IDB-financed projects for urban mass transportation and found that they have contributed to a reduction in GHG emissions.[88] For example, the Cali BRTS achieved significant emission reductions (CO_2 as well as local pollutants) between 2008 and 2012 (41%-46% relative to the

baseline), when it became operational.[89] Restructuring of routes resulted in fewer bus kilometers traveled to serve the same trips. However, several issues—including slow construction, difficulty in decommissioning obsolete polluting buses, and financial difficulties of the bus operators—affected the capacity of the Cali BRTS to address increasing mobility needs and may affect the sustainability of the CO_2 emission reductions. Similarly, the BRTS in Lima has achieved CO_2 emissions reductions (as well as reductions in local pollutants such as black carbon and airborne dust (PMx)) between 2011 and 2013, and reductions are expected to continue. As in Cali, emissions reductions were hampered by delays in the bus scrapping program and ongoing competition with the system from the traditional bus companies.[90] Finally, the two metro lines in São Paulo show potential for CO_2 emission reductions.

Most projects experienced implementation delays, which can compromise the achievement of GHG and local pollutant emissions reductions. Of the seven urban mass transport projects reviewed, all but two have had significant delays, due mostly to the complexities associated with undertaking large-scale infrastructure works in often dense and long-established urban areas.[91] In the Fortaleza BRTS, two of the three corridors originally envisaged, as well as investments in public space and pedestrian connections, were cancelled because of cost overruns and shifts in government priorities.[92]

In relation to CC mitigation, three of the five IDB roads projects reviewed by OVE[93] identified emissions reductions as an important co-benefit and included baseline information to assess the current level of CO_2 emissions (see Annex V). Both beltway projects in Brazil included in-depth analyses of GHG emissions. The Santa Catarina Infrastructure Logistics Program included a diagnostic of the CO_2 emissions for each section of road to be upgraded and estimated emission reductions per type of intervention.[94] Although emissions will increase over time because of increased demand for travel, the increased operational efficiency of the improved road means that emissions will be lower than would be expected without the project, providing perhaps a good example of potential trade-offs between improved mobility and emissions reduction.

Three of the five roads projects have improved driving conditions, and the two that were also analyzed for emissions were found to have reduced emissions (relative to the business-as-usual scenario) in the short term, though the long-term implications are uncertain. Where levels of vehicle congestion are high, road projects that increase the road network's capacity can improve driving conditions and shorten travel times for a significant number of private vehicles and freight carriers. However, in the medium and long term the effects of these projects are not so clear. In projecting the emissions reductions from these improvements, project designers tend to underestimate the induced traffic and overestimate how long this additional capacity will be able to maintain optimal service levels.[95] All the emissions reductions can end up being offset if service levels begin to decline and

OVE estimated emissions benefits for four IDB-financed projects for urban mass transportation and found that they have contributed to a reduction in GHG emissions.

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the number of vehicles circulating through the network becomes much higher than the pre-project level. Sustainability over time depends on complementary measures to promote multimodal transport and demand management.[96]

In addition to the direct effects on road use and travel time, new roads can have indirect effects on land use. Studies have shown that when new roads are located close to forests, they can have indirect effects on land use, facilitating deforestation and expansion of agricultural boundaries (Reymondin et al., 2013). For the Pasto-Mocoa road, the CC mitigation plans were limited to only the section of road being built and did not take into account the cumulative impacts of various sections of the road. Although the Bank activated the required environmental protection measures for a project developed in a sensitive area, there is uncertainty about the definition of the areas that are directly and indirectly affected by the project and the quantification of the project's negative impacts. When considering the benefits of this type of projects, the risks that investment will result in deforestation and changes in land use that can increase CO_2 emissions need to be considered.

The only policy-based project in the sample was the Program to Support the National Logistics Policy in Colombia (CO-L1090), approved in 2011. This program sought to reduce the country's transport logistics costs and import and export times through policy actions that support implementation of a National Logistics Plan. The program is supported by various TCs and by a TC loan that addresses important CC

issues.[97] The loan states an explicit overall CC objective—to develop policies that reduce the contribution of GHG emissions from the freight sector. The PBL provides important institutional strengthening measures that could have positive benefits in the long run. It also requires a study on the feasibility of increased use of waterways for freight as well as an increase in the menu of projects that would be eligible for NAMA (Box 11) and GEF financing.[98] However, it misses an important opportunity to foster policy reforms that would have wider emissions benefits, such as improved vehicle emissions standards for trucks, economic incentives for modal shifts, or the adoption of advanced technologies for freight.

Box 11. National Freight Transport Plan: NAMA Pilot Study (CO-T1229)

The Bank helped in preparing a pilot study to design a freight transport NAMA for Colombia. The NAMA proposal was integrated into the National Logistics Policy (CONPES 3547), approved by the Colombian Government as a way of shifting toward more sustainable forms of freight transport. This study includes estimates of emissions impacts and associated co-benefits, as well as feasibility studies, and it promotes public consultations on the issue of sustainable transport; defines a suitable institutional framework for the NAMA; defines the methodological requirements for developing the measurement, reporting, and verification programs; and identifies financial needs. With the NAMA, GHG emissions are estimated to be 35% lower than without a national logistics plan. Moreover, savings of around US$159 billion are estimated for 2012-2040, mainly in reductions in fuel consumption, because of the 5% reduction in journey distances.

Source: OVE Sector Study on Transport in Annex V.

C. Agriculture and natural resources

IDB strategic documents for the agriculture and natural resources sector identify two lines of action to address CC mitigation in the sector: (i) promote low-carbon agricultural practices, including agroforestry, conservation tillage, and alternative crop rotations; and (ii) promote forest management and protection of conservation areas.[99]

CC mitigation is relatively new in IDB's agriculture and natural resources portfolio, but the number of projects with mitigation co-benefits has increased sharply in recent years.[100] This increase is also attributable to operations under multilateral umbrellas such as the GEF and the Forest Investment Program (FIP).[101] Although livestock is the main source of emissions in agriculture in LAC, IDB's strategic documents largely omit this complex and significant issue.

The Bank has engaged relatively little in forestry in recent years, considering the sector's importance for CC mitigation. In-depth review of the few recent forestry projects approved by the Bank shows that these projects have combined

Climate change mitigation is relatively new in IDB's agriculture and natural resources portfolio, but the number of projects with mitigation co-benefits has increased sharply in recent years.

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mitigation (i.e., forest protection and management) with economic development opportunities for local populations. Results have been mixed. In Petén in Guatemala (GU-L1002), activities intended to strengthen agriculture and reduce pressure on the forest were not implemented. Although the project aimed at avoiding deforestation, more than 13,000 ha of forest were lost over 2010-2011. In contrast, in Brazil the IDB successfully supported the state of Acre (BR-L0313/ BR-L1289) in its efforts to develop a forest-based economy by strengthening the supply chains for forest-based products, creating productive forest reserves, and intensifying the land use of agricultural areas. IDB has also recently approved two projects to promote productive forestry in Argentina (AR-L1067) and Mexico (ME-L1120), the latter with FIP concessional resources.

Though it is too early to assess results, two recently approved agriculture projects stand out as highly relevant for both CC mitigation and adaptation: The Brazil Low-Carbon Agriculture and Avoided Deforestation to Reduce Poverty project (BR-X1028) and the CIMMYT *(Centro Internacional de Mejoramiento de Maiz y Trigo)* component of the Mexico Program to Strengthen Rural Public Goods (ME-L1045). Both promote the adoption of technologies that reduce carbon emissions by farms and ranches and enhance carbon uptake in vegetation and soils, while also increasing productivity. Their expected outcomes in terms of emission reductions

are identified, but such reductions may in practice be difficult to measure and attribute. The Brazil project also includes payments for environmental services to small- and medium-scale farmers.

During 2004-2013 the Bank also approved 11 operations related to livestock, though with little focus on CC. Country clients' demand for these interventions from country clients has been limited. Most of these interventions have sought to promote productivity and increase the quality of the beef and dairy products by increasing animal health or promoting innovative animal husbandry practices. Only one project included a component explicitly related to CC.[102] Looked at through a CC lens, these projects are positive from an adaptation viewpoint since they improve productivity, farmers' incomes, and the system's ability to respond to new pest outbreaks. From a mitigation standpoint, however, they could well have a negative overall effect as a larger herd increases methane emissions.[103] One offsetting factor is that healthy and productive animals reach their market weight faster and thus tend to emit less methane per kilogram of production.[104]

5

Climate change adaptation addresses both climate variability and climate change. The discussion has moved from a focus on biophysical vulnerability toward a focus on social and economic drivers of vulnerability and people's ability to adapt.

5 Results of IDB Support for Climate Adaptation in Selected Sectors

Addressing climate risk and reducing vulnerability to CC are challenges for most sectors and project teams in IDB. An adaptive management approach includes integrating climate risks and opportunities into development activities; identifying, prioritizing, and implementing adaptation actions; and monitoring, reassessing, and adjusting as new information becomes available (Verner, 2012). Climate change adaptation (CCA) addresses both climate variability and climate change. The discussion has moved from a focus on biophysical vulnerability (IPCC, 2007) toward a focus on social and economic drivers of vulnerability and people's ability to adapt (IPCC, 2014a). It is increasingly clear that operations focused on economic and social development can have important benefits in increasing resilience to climate risk. This chapter discusses some actions that can provide net benefits today and in the future in three key sectors: agriculture and natural resources, DRM,[105] and transport.

As in the case of CC mitigation, weak results frameworks and monitoring systems in many Bank projects add to the challenges of assessing the effectiveness of project contribution to CCA. Bank results frameworks define project outcomes vaguely, and there are no long-term evaluation tools to measure them. Furthermore, even if there were indicators with baselines and targets, Project Monitoring Reports (PMRs) and Project Completion Reports (PCRs) have rarely measured project outcomes. For TCs, few tools are available to measure results, making it difficult to gauge their relative successes or shortcomings. Given these weak information systems, OVE gleaned the results discussed below—often qualitative in nature—from portfolio analysis and country visits.

A. Agriculture and natural resources

IDB's strategic documents for the agriculture and natural resources sector are generally consistent with priorities identified in the CCA literature. The IDB has three documents to guide its CC actions in rural areas: the CC Strategy (March 2011), CC Action Plan (2012-2015), and Sector Framework on Agriculture and Natural Resources Management (May 2013). Together these documents lay out the following strategy:

- Increase financing of agricultural public goods. The agriculture sector needs to return to significant financing of public goods—pest and disease control; agricultural research, especially on crops and techniques suitable for small-scale farmers under conditions of increased temperatures and moisture stress; integrated water management systems; and crop insurance—with a heightened orientation toward climate change and climate variability.

- Orient interventions to increase the incomes and adaptability of the rural poor. The incomes of family and peasant farms should be increased through improved access to new technologies (directed innovation and extension); improved access to credit; marketing and purchasing associations to achieve economies of scale; and, where appropriate, cash transfers delinked from production parameters. Improved land tenure is a critical part of this package.

- Strengthen hydrological monitoring and weather forecasting. Improved hydrological monitoring and systems of weather and short-term climate forecasting are of high priority now and will become more so in the future.

These three priority areas are all important for CCA. Most of the agriculture projects with CCA co-benefits in the evaluation portfolio support agricultural public goods (in particular, plant and animal health, crop and animal research, and innovation), extension services to small- and medium-scale farmers, and water resource management (mainly for irrigation). If done well, these projects could reinforce the policy agenda in CCA, allowing the Bank to influence CC-related policies.

Despite an appropriate strategic framework overall, at the country level, there is moderate evidence that the IDB is always well positioned relative to CCA needs in agriculture. OVE found that IDB CSs played a limited role in defining climate adaptation priorities and new climate-related operations in the agriculture sector.[106] The trend in lending operations with CC relevance in the portfolio evaluated fell by 21% after 2010. In contrast, there has been a recent surge in CCA-related TC and investment grants in the agriculture sector—between 2012 and 2013 they doubled in number to 30 and tripled in amount to US$44 million—which may lead to stronger CC-related lending in the future.

Loans

TCs and investment grants

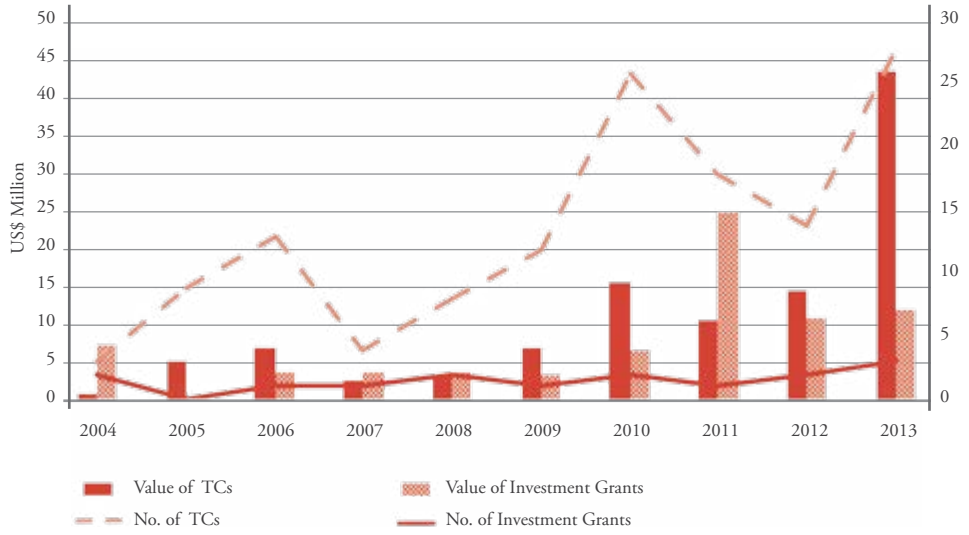

Figure 8:

CC-relevant agriculture projects, investment grants, and TCs(2004-2013), original approved amounts and number of projects

Source: OVE calculation, using IDB Corporate Database

In the sample of projects reviewed by OVE,[107] institutional strengthening components in investment loans have often been given lower priority during implementation than traditional components. Physical elements are being put in place, but too often the institutions required to put them to good use are lacking. IDB supervision does not correct this bias or adequately track implementation of the "softer" institutional components. This is problematic for CCA, as effective institutions are critical in responding and adapting to CC in areas such as agricultural research, plant and animal health, extension, and water resource management. For example, a solid legal and institutional framework has contributed to the success of Ecuador's water management project. In contrast, Peru's water project has been implemented in the context of a recent and incomplete consolidation of water management institutions, resulting in an institutionally complex project that deals with multiple levels of government and

It is increasingly clear that operations focused on economic and social development can have important benefits in increasing resilience to climate risk.

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suffers from weak commitment from regional governments. Though the project is roughly on track for the implementation of physical infrastructure, fully consolidating the institutional gains will require sustained reform efforts well beyond the project.

Despite many changes in project design and objectives during implementation, it appears that some positive CCA-related results have been achieved in the sample of agricultural public goods projects reviewed. Significant changes were made to the original design and objectives of projects in Mexico, Brazil, and Uruguay during implementation, while no significant investment has yet been made in the Dominican Republic in the fourth public goods project reviewed by OVE. In Mexico, a positive CC-relevant outcome appears to have resulted from links with the CIMMYT and the MASAGRO program *(Modernizacion Sustentable de la Agriculture Tradicional)*, which have produced CC-relevant research and positive extension results. The Uruguay project had a successful phytosanitary component, which is particularly important from a CCA standpoint.

Projects directed at improving small-scale farmers' and vulnerable populations' capacity to innovate and adapt to climate variability in recent years show improvements in project design. In the rural productive development program in Uruguay, a good project diagnosis and robust design, together with strong political support and good implementation, may contribute to positive results in improving farmers' capacity to use upgraded technology. In older projects, such as the Petén in Guatemala, lack of government ownership and the failure to ensure participatory governance have hindered project implementation and results (Box 12).

Box 12. Indigenous people and CC

Indigenous people make up about 10% of the population in LAC. The majority are dependent on natural resources for their livelihood and well-being,[a] and are thus highly vulnerable to CC. Because indigenous peoples are among the poorest populations in LAC, they are especially at risk from adverse environmental conditions. CC threatens not only their subsistence but also their cultures. On the positive side, indigenous people have important knowledge and experience in managing ecosystems and can contribute to decreasing emissions by maintaining forests and slowing deforestation and land use change.

Indigenous people inhabit some of the most biodiverse lands in LAC, and they have a significant role to play in conserving biodiversity. In South America, more than 25% of the 801 protected areas have some overlap with indigenous peoples' territories (Cisneros and McBreen, 2010.) Deforestation rates in indigenous territories tend to be significant lower than for other types of landholdings—even lower than in protected areas (Stevens et al., 2014; Hansen et al., 2013).

OVE could not find evidence of successful support for indigenous peoples in its CC-related lending operations, though it found some evidence of positive results in climate adaptation through grants and TCs involving indigenous people.[b] A review of five TCs and an investment grant with indigenous people as beneficiaries found positive signs that these operations were able to meet their stated objectives, strengthening traditional knowledge and practices related to natural resources management and improving livelihoods among indigenous people, as well as building capacity and strengthening institutions.

The most successful approaches were targeted to indigenous people and local communities, involved highly participatory mechanisms, and aimed to strengthen mitigation and adaptation capacity. A particularly good example was the Central America GEF-financed Integrated Indigenous Ecosystems Management Project (RS-X1007), which improved livelihoods in indigenous communities and developed skills for the conservation of biodiversity. It showed that indigenous people can effectively contribute to the reduction of carbon emissions by protecting their forests and managing land and natural resources with a combination of traditional knowledge and appropriate modern technology. The project also strengthened indigenous people's capacity to cope with negative CC impacts, by increasing their food security.

[a] Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but they have not been used consistently in adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation (IPCC, 2014a).

[b] The grant and TCs reviewed were the Central America GEF Integrated Indigenous Ecosystems Management Project; Productivity and Sustainability of Small Mayan Coffee Producers in the North Region of Guatemala, Terraces Recuperation in the Andes, and Adaptation to Climate Change and Indigenous Peoples in Peru; and the Regional Climate Change and Indigenous Peoples of the Amazon. The four investment projects reviewed were Porto Velho-Rio Branco Road Improvement Project and Acre Sustainable Development Program, Phase I and II, Brazil; and the Petén Development Program, Guatemala.

IDB still has a long way to go to mainstream knowledge and awareness of CC adaptation opportunities in the agriculture and natural resources sector. The Bank has substantial knowledge to offer, particularly in areas of past success, such as, for example, the Uruguay Rural Development program. However, so far this knowledge has not been documented. Moreover, because most of the reviewed projects with important CC co-benefits have not been framed as such, the Bank has missed opportunities to learn and mainstream CCA in relevant operations.

B. Disaster risk management

The IDB CC Strategy groups DRM with CCA strategies: "Both climate change adaptation and disaster risk reduction 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... 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" (IDB, 2012a).

In general, OVE found that DRM priorities identified in IDB CSs are aligned with countries' disaster risk levels. To measure the relevance of the DRM activities, OVE analyzed whether or not selected CSs[108] are placing sufficient importance on climate-related DRM (rated as low, medium, or high) as compared with the country's vulnerability to disaster risk (low, medium, or high) according to the World Risk Index.[109] The results show that in most cases—Colombia, Ecuador, Jamaica, Mexico, and Paraguay—CSs' priorities related to DRM reflect the severity of the country's climate-related disaster risk situation.[110] For 2 of the 10 countries—Brazil and Peru—the CSs place greater importance on DRM as compared to the countries' relative vulnerability to disaster risk. In only three CSs—Haiti, Nicaragua, and Panama—was DRM not prioritized in line with the countries' relatively high vulnerability to natural disasters.

The DRM portfolio is also aligned with the Region's vulnerability. In fact, the countries that lie on the "Caribbean hurricane belt" received the most IDB financing for DRM programs. The second most important subregion in terms of total funding is the Andean Region. This prioritization lines up with the World Risk Index's vulnerability map, which shows these regions as the most prone to disaster risk in LAC.

Yet IDB does not draw a strong link between DRM and CC at the project level, reducing the focus of the portfolio on explicit CCA measures and impact.[111] This may result from limited conceptual understanding of the linkages, or simply from an insufficiency of CC-related data to assess risks. As a result, governments tend to stay focused solely on DRM (or, more likely, civil protection and disaster response) rather than dealing with the implications of CC for DRM. In recent years, the

IDB has approved some innovative initiatives to better integrate DRM and CCA, although this linkage has not been reflected in specific guidelines or strategic documents.[112]

Of IDB financing for DRM, 85% is for ex ante measures—disaster prevention, preparedness and risk assessment (Box 13). Disaster preparedness accounts for only 7% of the funding in the DRM portfolio, while disaster prevention accounts for 76%, mostly PBLs that support government institutional reforms. The IDB appears relevant to governments in carrying out pre-disaster measures, although IDB activity in risk assessment has been limited.

Box 13. The DRM stages

Risk assessment - the analysis of potential hazards and of conditions of vulnerability that could potentially harm exposed people, property, services, livelihoods, and the environment.

Prevention – actions—ranging from policy reforms to infrastructure construction—to ensure that human action or natural phenomena do not result in disaster or emergency.

Preparedness - all the measures that can ensure an effective response—for example, contingency planning, stockpiling of equipment and supplies, evacuation, and public information.

Response - all activities that can tackle an emergency (relief and humanitarian assistance, public safety, basic subsistence needs).

Rehabilitation - actions that restore basic functions, including basic services rebuilding.

Reconstruction - actions that lead to full resumption of pre-crisis activity.

Although DRM PBLs have been implemented satisfactorily and have overcome coordination failures, the sustainability of the reforms depends on institutional capacity and governmental financial support. Also, the limited policy-reform content of the PBLs could limit their impact.[113] DRM activities often cut across many line ministries, and effective coordination is critical. In Colombia, the Government carried out reforms with success largely because of officials' high technical capacity and the high coordination standards among institutions—a context that promotes high sustainability in the medium and long term. The country's General Budget also has specific funding for the Adaptation Plan, and the institutions that manage the Adaptation Plan are directly related to the President's office. In Panama, by contrast, coordination problems between government agencies and between levels of government have been evident (PN-L1070, PN-L1074). Panama appears to lack sufficient institutional capacity to manage the new legislation (national risk plan, action plans, etc.), and there is a need for greater coordination between institutions and greater budgetary commitment from the government to cover the particular actions

associated with prevention. Although the third program's condition of approval of specific budget lines for prevention topics has been fulfilled, both the IDB and several institutions in the country report that funding for prevention issues remains a major constraint (Box 14). PBLs are generally focused at the national level.

Box 14. IDB value-added in DRM

The analysis, based on the sample of projects reviewed, suggests that the IDB adds value to DRM work through technical assistance, innovative project designs, and knowledge generation. An example of technical assistance is the Serra do Mar Program (BR-L1241), under which the IDB helped the Government of São Paulo introduce a detailed land-use planning system to help manage conservation areas. The IDB financed studies in risk-prone areas, helped with resettlement, and assisted the coordination of various administrative departments in the state of São Paulo. In Haiti, the country that is most vulnerable to natural disaster in the Region, watershed management (HA-L1005) and agriculture (HA-L1041) programs both presented innovative designs and mainstreamed DDR issues. Yet these projects failed to take into account the fragile social, economic, and institutional context, and implementation has not been fully successful. In Nicaragua (NI-L1048), the IDB added value by promoting changes in the DRM strategy and a more integrated DRM approach in the Ministry of Natural Resources.

On the knowledge side, the IDB has worked with academic institutions in the Region to develop a system of indicators for DRM that is both technically robust and relatively easily understood by policymakers, and that allows for comparative analysis among countries. So far, the IDB has produced and updated Indicators for Disaster Risk Management in more than 17 countries in the Region, and is using them to enhance its policy dialogue with the countries.

Source: OVE Sector Study on Disaster Risk Management (Annex III).

Response, rehabilitation, and reconstruction represent less than 15% of the IDB financing for DRM. Loans in these areas can strengthen countries' response to disaster and help protect already scarce national resources if a natural disaster strikes. Although the IDB has approved almost US$986 million for contingency loans, this instrument has not been used. Moreover, when there has been a disaster to respond to, some governments and IDB specialists report that triggers to disburse contingency operations are seen as too rigid and difficult to achieve, and in some cases it appears that neither the country nor the Bank has appropriate instruments to adequately measure the conditions.

C. Transport

Adaptation strategies in the transport sector can be classified into three main categories: (i) those oriented to identifying risks and vulnerabilities, (ii) those that seek to protect or strengthen the vulnerable infrastructure, and (iii) those that

seek to create alternative routes to enhance the transport system's resilience. LAC countries are beginning to respond to the risks that CC poses to the sector. The Region's transportation infrastructure has been undergoing constant improvements in technical specifications or initiatives to modernize transport networks. These improvements help to enhance the capacity to resist the effects of CC and can often be cost-effective when compared to the cost of responding to emergencies and rebuilding infrastructure affected by CC.

The IDB's strategic documents related to CC in transport are all relatively weak in the area of adaptation. The CC Strategy mentions "strengthening of national and sub-national authorities" but does not specifically mention CCA when discussing sustainable transport. Rather, it focuses on CC mitigation, or low-carbon solutions for both passengers and freight.[114] Yet the transport sector is highly vulnerable to CC, as Table 4 shows.

Table 4. Impacts of CC on transport systems

Dimensions	Examples of climate change impacts
Energy sources	• Droughts can harm electrical energy supply. • Extreme events can cause distribution failures and thus fuel shortages.
Infrastructure	• Rain can undermine roads, affect drainage systems and the stability of embankments, and affect river navigability. • Rains, floods, and drought can affect the stability of foundations. • Droughts can affect river navigability. • Storms can affect airport services. • Floods may damage bridges and streets in urban areas, and can cause massive damage to transport systems. • Storm surges can damage coastal infrastructure. • Rising sea levels can affect port facilities.
Transport network	• Storms and floods can cause damage to important primary segments in the transport network or secondary and connecting sections, consequently reducing its capacity to carry passengers and freight.
Attendant emergency situations	• Transport network interruptions caused by storms can limit access to affected areas and hamper rescue efforts. • Reduced port and airport services hinder the arrival of humanitarian aid. • The transport infrastructure needed for evacuation may be out of service or inaccessible after flooding.

Source: OVE Sector Study on Transport (Annex V).

The relative lack of attention to CCA is also evident in the Bank's lending portfolio.[115] Of the 41 CC-related transpor t projects in the CC portfolio, only 12 (mainly roads) address adaptation. When analyzed by component, the amount of resources devoted to adaptation is equivalent to 2% of the financing for the sector as a whole. Six of the 12 CCA projects have explicit objectives to reduce infrastructure vulnerability, and the other six have implicit CC objectives, as the project documentation incorporates the CC dimension into reconstruction or rehabilitation works.

The transport projects with CCA components that OVE reviewed (the six projects with explicit adaptation objectives) are all relevant, considering climate risks in the project areas. The Flood Mitigation and Infrastructure Program for Belize City aims to tackle a priority problem—to reduce the city's vulnerability to flooding

IDB needs to expand its assessments of climate risks and find innovative ways to integrate these risks and opportunities into development activities.

by rehabilitating, improving, and protecting the city's drainage and urban road networks. The rural connectivity program for the northern and eastern zones in El Salvador aims to improve rural road conditions and reduce vulnerability to CC. The Jamaica project[116] rehabilitated sections of road and included redesign to avoid similar damage in future storms. The Bank's projects in Nicaragua address climate vulnerability and damages to road infrastructure caused by recurring natural phenomena.

Though the objectives of these projects are relevant, it is not always clear how their climate dimension will be operationalized. The Belize project's main expected outcome is a reduction of flood levels and duration, but it is not clear how the climate dimension is incorporated into project design. Project documentation does not explain whether technical specifications for civil works were adjusted to consider the potential impacts of future weather patterns. In El Salvador the climate adaptation actions are limited to an institutional strengthening component of US$400,000 of a US$15 million loan. Moreover, the mechanism through which the institutional strengthening financed by the project will contribute to reducing the road infrastructure's vulnerability to CC in not clear. In Jamaica the objective was to incorporate measures to reduce the negative impacts of CC, but it is unclear how that would be done, as the project lacks explanation of the works to allow for a rehabilitation that is different from standard designs. The Nicaragua program addresses adaptation needs but could benefit from greater specificity (see Box 15).

Box 15. The Nicaragua transport program and climate adaptation

The Nicaragua program presents a logical intervention sequence: (i) identification of risks and vulnerable zones; (ii) infrastructure strengthening and technical specifications; and (iii) construction/rehabilitation of alternative routes. There is a noticeable effort to link the design of the adaptation-related components with forecasts of future extreme weather events as well as historical information about rising sea levels and tropical storm intensity and frequency. The first operation included a component (US$400,000) for preparation of a map detailing network vulnerability to hurricanes, floods, landslides, and rising sea levels. The second loan included resources to finance feasibility studies of the Chinandega-Guasaule road, which is important for interregional trade. The third and final operation provides more financing (US$3.3 million) for works on critical road access points on the border with Honduras. However, greater definition is needed with regard to the adaptation-related actions to be financed, since there is only a generic commitment for "actions to reduce the road network's vulnerability to the effects of climate change." The diagnostic lacks sufficient data to measure the problem in terms of traffic disruptions in the areas of intervention and to establish a baseline against which to measure the results.

The evaluative findings show that IDB has been mostly reactive in responding to current and future climate risks. In general, future climate challenges will require development trajectories that differ from business-as-usual approaches (IPCC, 2014a). IDB needs to expand its assessments of climate risks and find innovative ways to integrate these risks and opportunities into development activities. Yet IDB generally continues to follow business-as-usual and respond reactively to climate challenges, addressing immediate and anticipated threats and applying climate information from the past rather than projections for the future. In none of the evaluated IDB projects was a specific climate risk assessment made, applying information about projected future climate trends. In some sectors, such as the energy sector, CCA is still a pending issue.

6

The evaluation finds that IDB has made some progress toward achieving the overall objectives of its climate change strategy, though there is still a long way to go.

6 Summary and Recommendations

CC is having significant impacts in the LAC Region through changes in temperature, rainfall, sea level, and the number and severity of extreme weather events. These impacts are likely to grow in the future and to affect economies and households in all parts of the Region. LAC's GHG emissions derive primarily from energy (including transport), agriculture (mainly livestock), and LUCF. LAC countries are aware of these challenges, and many are taking steps to address them through institution-building and policy change.

This evaluation has reviewed and assessed the IDB's engagement in sectors and activities with important links to CC mitigation and adaptation. The IDB and other MDBs are expected to play an important role in mobilizing knowledge and financing to address the challenges of CC. The growing CC challenges need to be met with innovative and transformative responses, beyond business-as-usual (IPCC, 2014a). IDB's lending and knowledge activities have increased rapidly in recent years, and the time is ripe for an evaluation to learn from this growing body of operational experience and to inform the important global meetings and financing decisions ahead.

The evaluation finds that IDB has made some progress toward achieving the overall objectives of its CC strategy, though there is still a long way to go. The Bank's corporate, sector, and country strategies address CC issues unevenly, rarely providing the kind of in-depth treatment needed to create a clear forward-looking vision. The Bank's organization continues to evolve and adjust to advance CC mainstreaming, build technical skills, and produce knowledge products. The lending and TC portfolio in climate-related areas has increased in the past few years, although IDB does not yet have a fully effective system to track its CC-related activities. Private sector engagement has also increased, as have efforts to help governments strengthen their institutional structures to deal with CC. The Bank is still at a relatively early stage in these efforts and should continue to focus on these objectives.

Most of IDB's CC-related engagement to date has been in the energy sector. The most significant results in terms of reduced GHG emissions have come from IDB's support for hydropower expansion and rehabilitation. The IDB has been a major financer of renewable energies as well, particularly through its private sector window. This support has helped to build knowledge, catalyze activities, and leverage some concessional resources. However, there is room to improve IDB's value-added in private sector investments, and some renewable energy projects appear to have had other adverse environmental impacts.

Apart from energy, the Bank's activities in transport, agriculture and DRM have significant potential climate co-benefits. In transport, the Bank has recognized the importance of promoting sustainable low-carbon transportation solutions, and some projects—such as BRTSs, metro lines, and logistics projects—have resulted in significant reductions in GHG emissions. Mainstreaming of CC concerns is still at an early stage, however, particularly on the climate adaptation side. IDB's operational work in agriculture and natural resources and in disaster risk management has significant links with CC, particularly on the adaptation side. The forestry, including support to indigenous peoples, and livestock subsectors are critical to mitigation in LAC, but IDB has been least engaged in them in recent years.

This report highlights a number of areas of relative weakness where the Bank can usefully build on progress to date. First, while the CC Strategy has helped the IDB in setting priorities and guiding its work, the Bank's strategic framework for CC does not yet define specific niches where IDB has developed or can develop clear comparative advantages. Second, there is room for improvement in mainstreaming instruments, including wider development and application of the climate-risk screening tools and preparation of climate risk assessments, and expanded efforts to measure GHG emissions in relevant infrastructure activities. Third, the organizational arrangements in IDB need continued attention to ensure strong cross-sector collaboration and knowledge sharing. Fourth, there are still no systems to prioritize or assess the effectiveness of knowledge generation activities or to identify and track CC-related lending needs. Fifth, although the Bank's PBL can be used to strengthen institutions to address CC concerns, many PBLs do not appear to have reflected governments' long-term commitment or promoted deep policy reforms. Finally, private sector leverage is still limited, and continued efforts to mobilize external resources (concessional funds) and scale up successful efforts will be important if IDB is to play a major role in helping client countries mitigate the impacts of CC and adapt to CC going forward.

Inadequate results frameworks and monitoring systems in many Bank projects add to the challenges of determining project effectiveness and its contribution to both CC mitigation and adaptation. Bank results frameworks define project outcomes only vaguely, and PMRs and PCRs rarely provide solid information on results. For TCs, few evaluative tools are available to measure results, making it difficult to gauge

their relative successes or shortcomings. Stronger results frameworks and monitoring systems are needed to learn what works in reducing GHG emissions and increasing climate resilience and building capacity.

Given the findings summarized in this report and accompanying annexes, OVE offers the following four recommendations to IDB Management:

- Strengthen the mainstreaming of CC concerns in IDB by maintaining a highly qualified climate change group whose mandate and incentives are to provide cutting-edge technical knowledge and support to divisions in all three operational Vice-Presidencies—VPS, VPC, and VPP. This unit can be organizationally situated in any place in the Bank. Wherever situated, it needs to have a clear mandate and incentives to work across sectors and VP boundaries to help mainstream climate change issues in both country and sector strategies and in both sovereign guaranteed (SG) and non-sovereign guaranteed (NSG) operations. Incentives can include, for example, recognition of effective mainstreaming support in performance evaluations and career development, responsibility for mobilizing and monitoring IDB's use of external climate funds (GEF, CIF, and others), and responsibility for implementing and maintaining the CC classification and tracking system for the Bank.

- Deepen IDB's engagement in policy dialogue and operational support to address climate adaptation challenges in relevant sectors. Strong measures are needed to anticipate and reduce the negative impacts of current and projected future CC and thereby increase climate resilience in LAC. This requires that climate risks be considered in relevant projects from the design stage onwards, taking into consideration the needs of vulnerable people.

- Markedly strengthen the coordination between the Bank's public and private sector windows and scale up efforts to mobilize external resources to leverage the Bank's work. The Bank needs to develop a clear and focused strategy that will help it deploy its scarce human and financial resources to maximize its contributions and co-benefits. Two likely areas of comparative advantage and additionality are its ability to work on both the public and private sector sides—for example, on the policy framework as well as on the financing—and its ability to mobilize additional financing.

- Deepen the Bank's ability and incentive to track its activities and results related to CC adaptation and mitigation. With regard to activities, more precise criteria are needed to classify the Bank's CC portfolio and track the level of Bank activity in relevant projects. With regard to results, both PCRs (for SG operations) and Expanded Project Supervision Reports (for NSG operations) should be required to identify and discuss climate-related co-benefits in projects with significant potential impact on GHG emissions or climate resilience. Although such co-benefits are often difficult to measure precisely, progress in measuring results is likely to develop with experience.

Notes

1 The initiative was also the IDB's response to the new international clean energy investment framework being developed by the international financial institutions following the G8 Summit in 2005 (IDB, 2007).

2 OVE's assessment of the CC Strategy in the context of the IDB-9 Evaluation in 2012 (OVE, 2012) concluded that the CC Strategy is based on strong analytical work and presents a sound background analysis of the problems and challenges that need to be addressed with respect to CC at the regional level. However, the CC Strategy does not prioritize among different agendas across the Region, and it overlooks some key IDB comparative advantages.

3 OVE prepared four sector studies, each containing (i) a context and sector diagnosis that identifies challenges and opportunities in that sector related to CC, as well as main sector policies/actions to address CC adaptation or mitigation; (ii) a review of IDB sector and country strategies; (iii) an analysis of the IDB portfolio in the sector; and (iv) an evaluation of the results of a sample of IDB projects (see Annexes II-V).

4 Two CC labeling systems were in use at the IDB at the time of the evaluation, one prepared by the Office of Strategic Planning and Development Effectiveness (SPD) and one prepared by CCS. In January 2012, SPD approved Guidelines for Classifying Lending Program Priorities (IDB, 2012b), based on the definitions established in the IDB-9, to allow for consistent classification of projects under lending program priorities. OVE took these guidelines and international standards (OECD-DAC, 2011) into consideration. A new CC tracking system for IDB operations is expected to be deployed in 2014.

5 Annex I explains the methodology OVE used to build the IDB project database.

6 In Brazil, Mexico, and Peru, all climate-related sectors included in this evaluation were addressed. Additionally, the team visited eight countries to complete specific sector studies: Argentina, Guatemala, Haiti, and Uruguay for agriculture and natural resources; Argentina, Chile, Colombia, Costa Rica, Nicaragua, and Uruguay for energy; Colombia for transport; and Nicaragua and Panama for DRM. The evaluation team drew on previous OVE Country Program Evaluations and prepared a regional study covering the Small Island Developing States (SIDS) with a focus on Barbados, Dominican Republic, and Haiti (Annex VII).

7 Research shows that the glaciers in the tropical Andes are decreasing by 3% yearly (Rabatel et al. 2012). Only a few individual glaciers are behaving differently and have advanced (Southern Chile and Argentina).

8 A drying trend has been seen in northern Mexico, southern Central America, and most of the Caribbean. An increase in precipitation has been seen in most of northern South America, while southern South America exhibits a decrease. In Central America and the Caribbean, the observed changes in precipitation vary within the Region and between years and should be considered in connection with tropical depressions and hurricanes. In recent decades, there has been an increase in the number of hurricanes in the Caribbean, while little change has been identified in the Pacific. There has been an increase in total and extreme rainfall in the monsoon region of western Mexico. The South American monsoon region saw an increase in heavy precipitation during 1960-2000.

9 *Extreme weather and climate events* include storms, droughts and floods. OVE bases these calculations on data from EM-DAT, 2014. It is worth noting that the World Bank has done analyses using DesInventar data (with fewer countries and more data points per country) that indicate that EM-DAT probably underestimates the cost of damages by at least 50%.

10 Gender analysis suggests that male-headed households may be more vulnerable to CC than female-headed households, as female-headed households tend to have slightly higher per capita income and higher levels of income diversification than their male counterparts in Brazil, Mexico, and Peru (analyses based on data from 2008) (Andersen et al., 2014).

11 A World Bank (2010) study finds that globally it will cost up to US$100 billion a year to adapt to a temperature rise of 2°C by 2050. Other studies address the cost of CC by looking at, for example, child malnutrition. Nelson et al. (2009) find for LAC that around US$1.2 billion of investments annually would be needed to return to a perfect mitigation scenario by 2050—that is, child malnutrition at the 2010 level.

Notes

12 By comparison, UNFCCC Annex 1 countries represent 63.5% of global GDP, account for 18.4% of the world's population, and produce 35.3% of global GHG emissions. Emissions in LAC are highly heterogeneous. Trinidad and Tobago, Venezuela, and Mexico show the highest per capita levels (2.1, 1.5, and 1.3 tons CO_2 per capita, respectively), while Haiti, Nicaragua, and Guatemala have the lowest levels (0.3, 0.1, and 0.3 tons CO_2 per capita, respectively) (World Resources Institute, 2011).

13 While coal-based generation is the most important source of electricity in the world, LAC's power generation matrix is heavily concentrated on cleaner sources like hydroelectricity (50%) and natural gas (25%). South America has the highest share of hydro in its electricity matrix, representing 54% of its installed capacity. Central America and Mexico rely extensively on fossil fuels (43% and 75%, respectively) (MIF, 2013). Emissions related to electricity are concentrated in Argentina, Chile, Mexico, and Peru.

14 Vehicle miles traveled for motorcycles and automobiles are estimated to rise by 401% and 176%, respectively, between 2000 and 2030 (Façanha et al., 2012; CAF, 2011; Schipper et al., 2009; Timilsina and Shrestha, 2008.) Emissions per vehicle-km are a function of the age of the fleet, congestion levels, technical specifications that affect energy efficiency, fuel mix, and the average passengers or tons carried per vehicle (Schipper et al., 2009).

15 The vehicle fleet age varies—for example, it is 9 years in Mexico and 20 in Peru (UNEP, 2012). Age is associated not only with high levels of pollution, but also with lower average energy efficiency and thus higher emissions of CO_2 and other GHGs.

16 According to the IMF (2013), these subsidies are highly regressive: more than 80% of the economic benefits go to the richest 40% of households.

17 Brazil was responsible for about half of agricultural emissions and half of the emissions from land use change (down from two-thirds since early 2000).

18 Agricultural emissions consist largely of methane resulting from enteric fermentation in ruminant animals (cattle and sheep), manure deposition in pastures, and manure management. Land used for grazing livestock represents 75% of the agricultural area. LAC's cattle herd has increased from 320 million in 1990 to 400 million in 2010; some 77% of the increase occurred in Brazil alone.

19 Argentina, Barbados, Chile, Colombia, Costa Rica, Dominican Republic, Mexico, Peru, and Uruguay. Brazil also has developed a transport plan as part of its effort to reduce GHG emissions (Röser et al., 2014).

20 See IDB energy efficiency homepage at www.iadb.org, accessed on May 20, 2014.

21 Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay, and Venezuela have banned importation of used vehicles in the past decade; and Dominican Republic, El Salvador, Honduras, Jamaica, Mexico, Paraguay, and Suriname have imposed vehicle age restrictions on imports (UNEP, 2012). Mexico and Argentina require new vehicles to meet Euro IV and Euro V emissions standards, respectively—standards that primarily control local pollutants but also have lower CO_2 emissions.

22 A first adaptation step is addressing vulnerability to the present climate variability. Agricultural development and research—resulting in higher yields, more efficient input use, diversification, intensification, higher incomes, etc.—is also likely to reduce agriculture's climate vulnerability. Technological transfer and agriculture extension, particularly to small farmers, are especially important climate adaptation strategies. Insufficient information and a high degree of uncertainty about future climate variability and its potential impact calls for improved climate services, plant and animal health advice, and more resilient crops.

23 Based on the Hyogo Framework for Action (adopted by the UN General Assembly in 2005), which outlines a 10-year plan (2005-2015) for countries to reduce their disaster risk through five priority areas.

24 The Management document *Strategies, Policies, Sector Frameworks and Guidelines at the IDB* (IDB, 2012c) proposed to rationalize, ensure consistency among, and streamline the regulatory instruments that govern the Bank's operational work. It proposed the development of five sector strategies and 20 SFDs. Besides the CC Strategy, four other broad sector strategies were prepared: Social Policy for Equity and Productivity, Competitive Global and Regional Integration, Institutions for Growth and Social Welfare, and Sustainable Infrastructure for Competitiveness and Inclusive Growth. In addition, nine SFDs were approved—in Education, Labor, Health and Nutrition, Transport, Justice and Citizen Security, Housing and Urban Development, Support to SMEs, Financial Access, and Agriculture and Natural Resource Management. The CC Sector Framework Document is programmed to be approved in 2015.

25 It could have been strengthened with additional guidance on identifying and targeting at-risk populations and tailoring research and innovation and plant and animal health initiatives toward changing climatic conditions.

26 The Sector Notes were intended to support the mainstreaming of CC considerations by identifying impacts and proposing specific mitigation and adaptation measures at the country level.

27 The Guyana Country Strategy was actually built around the Government's Low Carbon Development Strategy, which includes both CC mitigation and adaptation approaches.

28 Other country strategies—Barbados (2009-13), Haiti (2011-15), Paraguay (2009-13) and Venezuela (2011-14)—have combined CC with DRM, though few refer to the link between DRM and CC adaptation.

29 The instruments: (i) land use change emission calculations in a GHG emissions accounting tool; (ii) scoping studies on selected IDB projects and agriculture/forestry/land use change GHG emissions; (iii) empirical remote sensing of deforestation; (iv) and identification and GHG emissions estimates of road projects.

30 IDB's annual Sustainability Report estimated that direct GHG emissions associated with "most complex projects" from the 2013 portfolio (0.55 million tons of CO_2eq) were significantly lower than those reported in 2012 (4.2 million tons).

31 For instance, for transport projects, ESG calculates GHG emissions associated with construction and road operation and maintenance in the first year (assuming fixed demand), while those from the expected use of the road by general traffic are excluded (see Annex V).

32 Other MDBs are developing similar screening tools.

33 KNL has organized a number of other learning/training events to support IDB clients: workshops on (i) CC and water resources in Trinidad and Tobago, (ii) opportunity costs associated with REDD in Colombia, (iii) the implications of CC for Finance Ministry officials in Peru, (iv) microfinance and CC in Barbados; and (v) financial instruments to promote sustainability strategies for financial intermediaries.

34 Recognizing the inherently cross-cutting nature of CC, other MDBs have tried different institutional arrangements for their CC units—directly under the Chief Operating Officer in the African Development Bank, within the Vice Presidency of Knowledge Management and Sustainability in the Asian Development Bank, and as a separate Vice Presidency for Climate Change in the World Bank.

35 As of June 2014, CCS has a total of 19 professional staff, of which 5 are located in field offices and 14 at Bank Headquarters. CCS also has a "resident" specialist from the Gender and Diversity Division, and shares a specialist with the Private Sector Department.

36 These included interviews with Regional Managers and Country Representatives (10) in the Vice-Presidency for Countries (VPC), Manager and Division Chiefs from INE in the VPS, the advisor to the Vice-President, and staff in ESG and KNL.

37 OVE commissioned a climate scientist and coordinating and lead author of the IPCC, to carry out this task.

38 E.g., O.O. Chisari and S. Galiani (2010), Climate Change: A Research Agenda for Latin America and the Caribbean (technical note); W. Vergara, C. Alatorre, and L. Alves (2013), Rethinking our Energy Future. A White Paper on Renewable Energy for the 3GFLAC Regional Forum (discussion paper); and J.P. Bonilla (2010), Climate Change: A Regional Perspective (Washington, DC: IDB and Economic Commission for Latin America and the Caribbean) (monograph).

39 E.g., A. Garlati (2013), Climate Change and Weather Extreme Events in Latin America: An Exposure Index (technical note); R.G. Compeán (2013), Weather and Welfare: Health and Agricultural Impacts of Climate Extremes, Evidence from Mexico (working paper); and R. Funaro (2013), Climate and Development – IDEAS.

40 *"To increase technical and scientific capacity and knowledge throughout the Region"* is one of the primary SECCI functions. SECCI funded more than 40% of the knowledge TCs approved between 2004 and 2013 (IDB, 2007).

Notes

41 Studies in agriculture covered topics such as GHG emissions (US$17.5 million), forestry and land use (US$7.6 million), biodiversity (US$5 million) and water resources (US$4.4 million). Energy studies addressed RE and EE issues (US$15.4 million). Other important products have addressed CC impacts on glaciers and bio-fuels.

42 Some financed contests to promote innovation (e.g., IDEAS), and others supported forums (e.g., Global Green Growth Forum) and international initiatives (e.g., UN's Sustainable Energy for All).

43 These guidelines are broad and somewhat arbitrary. In OVE's view they are unlikely to precisely track lending trends in priority areas (OVE, 2012). A new tracking system for climate-related operations is being developed by CCS and ESG and is programmed to be deployed in 2014.

44 OVE took Management's guidelines into consideration, but also applied expert opinion and international standards (OECD-DAC, 2011) to construct the portfolio dataset for this evaluation (see Annex I). As Chapter I noted, the evaluation does not look at CC-related activities in other Bank sectors.

45 In the Andean and the Southern Cone subregions, more than 50% of the portfolios are concentrated on CC mitigation in the energy sector. Regional programs are also largely focused on energy. In the Caribbean, the portfolio is almost evenly distributed between mitigation and adaptation. CC PBLs are predominant in Central America and Mexico.

46 Reductions in the approvals of PBLs explain the portfolio drop from 2011 to 2012. After 2012, reductions in SG loans (from US$1.8 billion in 2012 to US$1.1 billion in 2013) and NSG loans in the energy sector (from US$1.1 billion in 2012 to US$722.4 million in 2013) explain the drop in the 2013 portfolio.

47 PBLs have been totally disbursed during the period of analysis. The NSG portfolio has disbursed 56% of the total approved amount, followed by TCs (49%), investment loans (47%), and investment grants (38%).

48 DRM projects with explicit CC objectives account for 41% of the total approved amount; in agriculture and natural resources, 18% have explicit CC-related project objectives. In transport, 24% of the total approved amount relates to projects with explicit CC objectives.

49 The remainder financed new transmission and distribution lines (19%) or were PBLs with no explicit or implicit RE or EE components (3%) (see Figure 5).

50 Investment grants, guarantees, and credit lines were not included in this portfolio.

51 Transport GHG emissions mitigation strategies can be classified into three categories: (i) *avoid*—that is, limit the growth of transport activity that requires motorized modes dependent on fossil fuels; (ii) *shift*—offer alternatives to traditional means of transport and encourage the change toward more efficient and less polluting models; and (iii) *improve*—enhance the energy efficiency of existing transport systems through such means as new technologies, operational infrastructure, and connectivity.

52 To define the agriculture and natural resources portfolio, OVE reviewed all operations in three IDB-defined sectors—agriculture (AG); water and sanitation (AS), which includes integrated water resource management; and environment and natural disasters (PA), which includes forestry and biodiversity—and selected those with CC-related objectives or components (see Annex II). OVE did not include projects related to sustainable tourism, environmental governance, and water and sanitation programs.

53 In addition, the IDB has financed 22 TCs promoting the strengthening of information systems and management practices for protected areas in the Brazilian Amazon (community-based forest), financing the establishment of forest management plans or pilots for REDD+ mechanisms in Peru, supporting the design of national plans for avoided deforestation in Guatemala, and promoting integrated ecosystem management programs for indigenous peoples. Two projects were financed with FIP resources and three with GEF funds.

54 The most important was the adoption of technologies that reduce GHG emissions from cattle in Uruguay, approved in 2012 for US$65 million, with the purpose of developing an improved system of dairy cows, a processing plant for milk powder, and a biogas plant to capture methane and generate thermal energy. Only the Acre project promotes the adoption of technologies that reduce GHG emissions from agriculture practices.

55 In water management, 97% of the resources are for CC adaptation and only 3% include conservation of water sources, generating both mitigation and adaptation co-benefits.

56 One investment loan in Trinidad and Tobago (US$120 million) was the biggest contributor to the increase (TT-L1036 Flood Alleviation and Drainage Program).

57 *Knowledge generation* refers to projects focused mainly on studies and information dissemination related to CC; *institutional strengthening* refers to projects seeking to create or improve institutional and technical capacity through training, seminars, etc.; *project preparation* is for the elaboration of future investment programs and PBLs and includes pre-investment studies; and *pilot projects* are stand-alone projects, normally small investment TCs.

58 The IDB approved two very large climate-related TCs in Peru and Brazil in 2012 and 2013: the Sustainable and Efficiency Management of Peruvian Energy Resources (PE-X1007, US$18 million), co-funded by CIDA, and the Initiative for Forest Information (BR-T1277, US$16 million), co-funded by the FIP.

59 It serves as an interim measure pending the effectiveness of a UNFCCC-agreed climate-finance structure.

60 The IDB has also included institutional strengthening components in investment loans, but these are not analyzed in this section.

61 OVE defines *CC PBL* as all PBLs approved by the CCS Division, as well as the PBLs approved in the Energy, Transport, and Disaster Risk Management divisions that address CC either through the design of the program or as an explicit objective in their loan proposals.

62 The selected countries are Barbados, Colombia, Mexico, Panama, and Peru. The sample includes (i) three subregions (CID, CAN, CCB); (ii) three sectors (CCS, ENE, DRM); (iii) at least one program with subsequent operations approved; and (iv) at least one program without subsequent operations approved. All the PBLs selected are programmatic and have explicit CC-related objectives. Selected projects: Program to Support the Development of a Climate Change Agenda in Colombia (CO-L1063); Program in Support of Mexico's Climate Change Agenda (ME-L1053, ME-L1058, ME-L1078); Support Program for the Climate Change Agenda in Peru (PE-L1080, PE-L1108, PE-L1127); Disaster Risk Management and Climate Change Adaptation Program in Colombia (CO-L1103); Program to Reduce Vulnerability to Natural Disasters and Climate Change in Panama (PN-L1070, PN-L1074); and Support for Sustainable Energy Framework for Barbados (BA-L1022, BA-L1021).

63 The evaluation reviewed 124 commitments in the policy matrixes of the six PBL series. Of these, 77% were to create or strengthen climate-related units in public institutions, address institutional coordination failures, or conduct studies and collect information for policy decision-making. The remaining 23% aimed at designing, proposing, or approving new policies, or changing existing policies (policy reforms).

64 Almost half of the commitments were policy reforms with little structural depth—for example, policy reforms left at the outline or proposal level without including government approval. Only one-fifth of the commitments aimed at achieving more in-depth policy and institutional reforms: for example, the approval and implementation of the National Climate Change Special Program (2009-2012) in Mexico, the approval of a National Strategy for Financial Management of Disaster Risks in Panama, and the approval of the National Adaptation and Risk Management Plan in the Agricultural Sector 2011-2020 in Peru.

65 In fact, of the 16 PBL programs approved between 2008 and 2013, only 7 have been fully implemented. Only the second phase of the program in Dominican Republic is in the pipeline for 2014. The rest (13 operations planned) are still not approved or in the pipeline 2014/2019 (IDB database, retrieved in August 2014).

66 See minutes of the policy and evaluation committee (PEA/11/3) of March 10, 2011, para. 1.17.

67 Two-thirds of the projects went to four countries: Brazil (13 projects), Mexico (9), Uruguay (5), and Chile (4).

68 These are the Energy Efficiency Guarantee Mechanism, BR-L1111 (GEF), and the Central America Regional: Increasing Private Sector Clean Energy Investment, RG-X1125 (Nordic Development Fund).

Notes

69 A full discussion of sector findings is found in the Sector Studies for these sectors (Annexes II, IV, and V).

70 For instance, although six urban mass transport projects included reduction of GHGs as an explicit objective or as indicators in their results matrix, two-thirds of the reviewed projects with GHG indicators and half of all urban transit projects included sufficient data to estimate GHG emissions levels (baseline) from which to track progress and results. The project diagnosis lacked a clear dimensioning of the GHG emissions. In energy, only 9 of the 43 evaluated projects in the public sector portfolio (4 PBLs and 5 investments) actually set mitigation targets and planned to measure GHG emission reductions. See OVE Sector Studies, Annexes IV and V.

71 In El Salvador, the negotiation of the second PBL of the programmatic series for sustainable energy occurred in a context of strong fiscal constraints. Unlike the first PBL, the conditions for the second were not yet implemented, and the timely disbursement of resources was not ensured. The Government and the Bank agreed to reorient the PBL toward the area of CC, with fewer conditionalities, allowing for timely disbursement.

72 To perform these calculations, OVE took the figure for proposed GHG emissions abatement directly from the loan documents. When the loan proposal did not contain such information, OVE multiplied the project's expected generation per year by an estimated emission factor using OLADE, 2012.

73 This is an integrated intervention under which, since 2007, seven loans have been approved for a total of US$225.4 million, with three programs: the Electricity Sector Support Program, the PNESER *(Programa Nacional de Electrificación Sostenible)*, and a three-stage PBL. The Bank has been relevant, articulating additional financial support that includes concessional funds through the CIF.

74 The regulatory and institutional changes promoted through this intervention have opened the possibility of expanding the contribution of new RE sources. Nicaragua is one of the most attractive clean energy markets in LAC; it received US$1.5 billion in cumulative clean energy investment in 2006-2012, which represents 5% of its total GDP. This has allowed the incorporation of 80 MW from wind generation as well as the development of a geothermal plant of 72 MW. Losses in the transmission network are being reduced by 4.56%. The reduction of electricity consumption is estimated at 221 GWh per year.

75 Many sponsors of the IDB private sector RE portfolio are world-class companies with access to national and international financial markets. Although having large and experienced sponsors may be positive from a project finance perspective, it tends to reduce IDB's financial value-added. Moreover, 72% of the Bank's private sector RE portfolio is located in investment-grade countries, 68% in the five richest countries in the Region, which have the most developed financial sectors. The average share of IDB financing in overall project cost is 12%. In 40% of the projects the IDB is one of several participating MDBs.year plan (2005-2015) for countries to reduce their disaster risk through five priority areas.

76 SCF refers to these operations as take-out financing on the grounds that the Bank substitutes a shorter-tenor bridge loan used to finance the riskier part of the project (typically the construction phase) with a longer-tenor loan. OVE considers that the substitution of a loan with another that has different terms is refinancing. The reference to take-out financing might not be appropriate in this case, as take-out financing requires a binding formal agreement between parts before the construction phase, in which the lender agrees to provide permanent financing if certain conditions have been met. See Annex IV for further details.

77 According to the project document, Uruguay is expected to increase its wind power installed capacity by 1,000 MW (roughly one-third of the installed capacity) in 2015.

78 The savings from the coal-fired power station were roughly comparable to the 381,000 tons of CO2eq saved by the largest operational wind farm in Mexico. Since then, the Bank has approved a loan for a new, larger wind farm, but it has not yet been constructed.

79 These gains are distributed as follows: 77.6 MW from the Furnas plant in Brazil, 32 MW from the Péligre Plant in Haiti, 18 MW from the Santa Barbara and Central America plants in Nicaragua, and 795 MW from the Simón Bolívar plant in Venezuela.

80 The Bank designed a Conditional Credit Line Investment Project (CLIPP) for green financing in Colombia (CO-L1124 - US$650 million), executed by BANCOLDEX.

81 Promoting the development of small-scale EE projects has proven to be more difficult, as small firms face high transaction costs and low financial returns from these investments (partly because of energy subsidies), and they require access to long-term financing. Even in operations with associated green credit lines that seek to target smaller producers, the financial intermediaries have tended to drift toward large-scale projects.

82 Updated Regional Environmentally Sustainable Action Plan 2013-2014.

83 The Joint MDB Statement for Rio+20 in 2012 defined sustainable transport as "transport that is accessible, affordable, efficient, financially sustainable, environmentally friendly and safe." As such, sustainable transport seeks to consider/balance economic, social, and environmental/CC objectives into project design.

84 The Action Plan's main objectives include (i) mainstreaming CC issues in IDB operations and scaling up investments in low-carbon sustainable practices, and (ii) promoting a co-benefits approach that integrates CC mitigation and adaptation with other economic, social, and environmental objectives.

85 According to the Transport Sector Framework, Bank activities will focus on five areas: (i) coverage, capacity, quality, and connectivity of transportation; (ii) cargo/freight logistics; (iii) sustainable urban transport; (iv) regional integration; and (v) institutional development.

86 The sector framework focuses on improving freight logistics, which would reduce transportation costs and thus increase the efficiency of goods movement, resulting in positive co-benefits in the form of reduced emissions of both local and global pollutants; however, the strategy does not highlight these co-benefits.

87 Demand-side interventions to reduce emissions are measures that encourage travel and consumer behavior that would reduce emissions—for example, pricing mechanisms to encourage modal shifts, the uptake of low-carbon technologies (e.g., fuel-efficient vehicle technologies), or travel at different (less congested) times of day or along less congested routes. Complementary measures are those that might support a particular investment—for example, providing bike parking at transit stations to encourage access to stations by sustainable modes (rather than by private vehicles). Most such complementary measures have been implemented by governments. For example, the Government of Brazil adopted fuel quality standards with the potential for significant CO_2 emissions reductions.

88 OVE collaborated with Grupo Sur, University de los Andes, Bogotá, Colombia, and the Clean Air Institute (for the Cali and Lima BRTS projects) to estimate CO_2 emissions for four of the public transport projects, three of which were fully or partially disbursed (Lima BRT, PE-0187; Cali BRT-MIO, CO-L1001, and São Paulo Metro Line 4, BR-L1079) and one project under implementation (São Paulo, Metro Line 5, BR-L1227). Annex V describes the methodology used for these calculations.

89 Reductions stemmed from (i) the scale of the project (it attempted to reform nearly the entire public transport system and reach 98% of the demand), and (ii) the renewal of the vehicle fleet, and the reform of the bus system. To date 3,851 buses have been scrapped and replaced by new buses that meet Euro III emissions standards, reducing emission factors, and Euro IV and V vehicles have been introduced into the fleet. In 2013, 897 buses were operating, of the 1032 originally planned.

90 As of February 2014, Lima's *chatarreo* program had scrapped 1,680 vehicles, or 26% of the target of 6,470 (Protransporte, 2014).

91 In the case of the Cali BRTS, the final trunk road of the BRTS has experienced significant delays because the project required the resettlement of nearly 1,000 families.

92 The scope of at least two projects in Brazil was significantly reduced, compromising the coherence of the interventions and, as a result, their ability to generate emissions reductions. In the Transport Program for Brasilia, the project's scope was reduced to road improvements. As a result, important components related to the public transport management system and the control center were not implemented.

Notes

93 The projects reviewed were three interurban roads (San Francisco-Mocoa Alternate Road, CO-L1019, 2009; Ceará III Road Program, BR-L1181, 2009; and the Santa Caterina Logistics Infrastructure Program, BR-L1336, 2012) and two operations for the metropolitan beltway of the city of São Paulo (Rodoanel Oeste, 2009, and Rodoanel Norte, 2011).

94 Using HDM-4, emissions were estimated according to fuel consumption, vehicle type, and operating speeds, which can vary according to the roughness of the road surface, the road geometry, and the level of service.

95 The increase in traffic may continue until it reaches the previous levels of congestion, and the capacity of the road network cannot be increased indefinitely. The availability of new roads may generate pressure to urbanize the surrounding areas.

96 Multimodal integration policies include public transport infrastructure, bicycle and pedestrian infrastructure, investment in railway systems, and development of waterway systems.

97 The Bank has financed (i) CO-T1237, to develop a methodology for measuring freight transport emissions and defining mitigation measures; (ii) CO-T1229, to develop a NAMA action plan; (iii) CO-T1238, to prepare a study of alternative modes of freight transport using river courses; and (iv) CO-T2219, to draft a strategy for promoting the widespread use of bicycles.

98 The PBL policy conditions include institutional strengthening for freight logistics management, establishment of information systems, and studies and policy guidelines.

99 The IDB has three documents to guide its CC actions in rural areas: the CC Strategy (March 2011), the CC Action Plan (2012-2015), and the Sector Framework on Agriculture and Natural Resources (May 2013).

100 See Annex II for an explanation of the portfolio analyzed (Table 8).

101 Between 2010 and 2013, the IDB financed six operations through the GEF, accounting for US$14.7 million, and seven operations through the FIP, accounting for US$36.6 million.

102 One loan for cattle ranching aims explicitly at adoption of technologies to reduce GHG emissions by cattle: the Estancias del Lago Project in Uruguay, which was approved in 2012 with the purpose of developing an improved dairy system, including a biogas plant to capture methane and generate thermal energy.

103 It should be noted that a larger herd in one place may simply be displacing herds elsewhere—and probably herds with greater GHG emissions per kilogram of production. Similarly, it may simply be filling increasing demand—and more efficiently than if done elsewhere.

104 Food-demand management is also an effective way to reduce cattle emissions (Bajželj et al., 2014)

105 The link between adaptation and disaster risk management has been highlighted since IPCC (2007) and the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (IPCC, 2012).

106 Since the Bank cannot possibly work in all the areas identified as important in a country's National Communication (NC), OVE assessed whether the areas chosen by the Bank were also areas defined as priorities in the NCs. For half of the eight countries reviewed—Argentina, Ecuador, Mexico, and Uruguay—the IDB priorities corresponded with the NC priorities. Argentina, Mexico, and Peru showed most evidence of strategic planning—and they were the only countries for which a Climate Thematic Note was prepared (see Annex II). The assessment is focused on agriculture (it does not include other activities of the Natural Resources Division).

107 OVE reviewed nine agriculture and water management projects in depth: Chimbrazo Rural Development Program in Ecuador (EC-L1121); Water Resource Management Modernization Program in Peru (PE-L1070); Argentina Water Infrastructure for the Northern Provinces (AR-L1015); Brazil Agricultural Research Project (AGROFUTURO- BR-L1001); Low Carbon Agriculture and Avoided Deforestation for Reducing Poverty (BR-X1028); Mexico Program to Strengthen Rural Public Goods (ME-L1045); Uruguay Support for Agricultural Public Management (UR-L1016); Rural Productive Development Program (UR-L1064); and Dominican Republic Agricultural Research and Development Program (DR-L1054) (see Annex II).

[108] OVE analyzed 10 current IDB CSs: Brazil, Colombia, Ecuador, Haiti, Jamaica, Mexico, Nicaragua, Panama, Paraguay, and Peru (see Annex III).

[109] The World Risk Index measures a country's vulnerability to disaster risk by taking into account exposure to natural hazards, the susceptibility to suffering harm, coping capacity, and long-term adaptive capacity.

[110] Ecuador and Jamaica face high climate-related disaster risk, and their strategies give priority to DRM. Paraguay has low climate-related disaster risk, and its strategy does not prioritize DRM. Mexico and Colombia face high risk but also have the resources and human and institutional capacity to manage that risk. Thus their relative need for support from the IDB in DRM is lower, and this is reflected in their CSs.

[111] 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 CC (mostly approved after 2011); and 11 operations include CC issues in the project document diagnosis as a component or indicator.

[112] 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, and monitoring exercises. The Emerging and Sustainable Cities Initiative, launched in 2011, also includes assessment of cities performance on CC and disaster risk planning. Other projects, as the Strengthening of capacities for the integrated management of disaster risk in Guatemala have incorporated CC scenarios to estimate risk of natural disasters at a national level. The implementation of recommendations from these studies is still a challenge and depends on financial resources, institutional capacity and prioritization of actions within the government's agendas.

[113] The evaluation reviewed in depth the PBLs approved in Colombia (CO-L1103) and Panama (PN-L1070, PN-L1074) and found that 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, only 23% were policy reforms. Moreover, more than 25% of them were policy reforms with little structural depth. 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.

[114] The CC Strategy has a section on transport systems and their vulnerability to CC, but there is no strategic guidance on how to reduce climate vulnerability in the transport sector. The Transport Sector Framework notes that one shortcoming of the Bank's work has been a focus on disasters over preventive strategies to reduce network vulnerability by developing adaptive standards and technologies in the construction, rehabilitation, and conservation of infrastructure. It does not outline specific strategies to improve the resilience of transportation infrastructure and services.

[115] OVE analyzed six projects in depth: Flood Mitigation and Infrastructure Program for Belize City, Belize (BL-L1013); Rural Connectivity Program for the Northern and Eastern Zones in El Salvador (ES-L1061); Support to Transportation Sector (NI-L1049, NI-L1052 and NI-L1071); and Transportation Infrastructure Rehabilitation Program in Jamaica (JA-L1016). The three operations in Nicaragua form part of the same program and have therefore been analyzed as a unit. Only the Jamaica project is completed; for the other projects, given the newness of the portfolio, OVE's analysis focused on project design rather than results.

[116] This operation followed an emergency operation (JA-L1015, Emergency Assistance in Response to Flood Damage) approved in 2008 to restore services and basic mobility following the damage from the hurricane season of 2007.

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