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Options Paper: Reducing Climate Risk in IDB Operations

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This Technical Note was prepared by the Environmental and Social Safeguards Unit (ESG) of the Vice Presidency for Sectors and Knowledge (VPS) of the Inter-American Development Bank (IDB). ESG works to promote the environmental and social sustainability of Bank operations. It collaborates with project teams to execute the IDB's commitment of ensuring that each project is assessed, approved and monitored with due regard to environmental, social, health and safety aspects, and that all project – related impacts and risks are adequately mitigated or controlled. ESG also helps the Bank respond to emerging sustainability issues and opportunities.

This paper is a consolidated version elaborated by Fareeha Y. Iqbal under supervision of Paul Suding (VPS/ESG), based on earlier drafts and consultancy studies by Fareeha Y. Iqbal and Maarten van Aalst.

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ACRONYMS AND ABBREVIATIONS

AfDB	African Development Bank
ADB	Asian Development Bank
CBD	Caribbean Development Bank
DFID	Department for International Development (UK)
DRR	Disaster Risk Reduction
EBRD	European Bank for Reconstruction and Development (WB)
EC	European Commission
ECC	Sustainable Energy and Climate Change Unit
EIA	Environmental Impact Assessment
ERM	Eligibility Review Meeting
ESG	Environmental and Social Safeguards Unit
ESIA	Environmental and Social Impact Assessment
ESMR	Environmental and Social Management Report
ESS	Environmental and Social Strategy
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IBRD	International Bank for Reconstruction and Development (WB)
ICSID	International Centre for Settlement of Investment Disputes
IDA	International Development Association (WB)
IDB	Inter-American Development Bank
IFC	International Finance Corporation
INE	Infrastructure and Environment Sector
IPCC	Intergovernmental Panel on Climate Change
KNL	Knowledge and Learning Sector
LAC	Latin America and the Caribbean
LEG	Legal Department
LGP	Loan or Guarantee Proposal
LRR	Loan Results Report
MDB	Multi-lateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
M&E	Monitoring and Evaluation
NSG	non-Sovereign Guarantee
OECD	Organisation for Economic Co-operation and Development
PA	Project Abstract
PAL	Proposal for Loan Approval
PCR	Project Completion Report
POD	Proposal for Operational Development
PP	Project Profile
PPMR	Project Performance Monitoring report
PSR	Project Supervision Report
RND	Environment, Rural Development and Natural Disasters Division
SCF	Structured and Corporate Finance Department
SG	Sovereign Guarantee
TC	Technical Cooperation
TOR	Terms of Reference
TSP	Transport Division
UKCIP	United Kingdom Climate Impacts Programme
UNFCCC	United Nations Framework Convention on Climate Change

USAID	United States Agency for International Development
VPS	Vice Presidency for Sectors and Knowledge
WB	World Bank (IBRD and IDA)
WBG	World Bank Group (IBRD, IDA, IFC, MIGA, ICSID)
WSD	Water and Sanitation Division

CONTENTS

1 INTRODUCTION

Main messages of this chapter

- Climate change is occurring, with changes projected for LAC's climate, coasts, water resources, and natural ecosystems.
- Projected changes in climate include long-term changes in temperature and rainfall as well as a possible increase in the severity and frequency of extreme climatic events such as floods, droughts, and hurricanes.
- Adaptation in crucial. Operation in development sectors such as infrastructure, irrigation, hydropower, natural resources management, and agriculture could be adversely affected by failing to consider changing climatic variability and long-term trends.
- Impacts of climate change in turn have profound implications for human health, coastal management, infrastructure design, agricultural choices, and a host of other development related aspects, which renders it necessary to consider them in project conceptualization and design.

1.1 Background and Objectives

This paper explores options to minimize threats posed to IDB-financed physical investments by the impacts of climate change.

A large proportion of projects are implemented in climate-sensitive sectors (e.g., agriculture, water resources, and transport). In these cases, the norm is to consider historic climatic trends for guiding project conceptualization and design. However, there is growing realization among international development agencies—including the IDB—that this may not be sufficient; many multilateral and bilateral development agencies now recognize the need to also consider *future changes* in long-term trends of climatic variables, as well as the possibility of an intensification or increased frequency of extreme climatic events such as floods, droughts, and hurricanes.

In order to present informed options for steps that IDB staff can take to increase the resilience of investment lending in the face of climate risk, the paper discusses (i) procedures being developed or considered by other MDBs (the World Bank, IFC, ADB, AfDB, EBRD, CBD, and OECD); (ii) existing policies and safeguards that can support consideration of climate risk in IDB operations; and (iii) proposed options, milestones and timeframes for implementing a consistent, phased approach to building resilience to climate change in IDB operations.

The goals of this paper are:

(i) To identify opportunities and constraints to safeguards-based approaches for climate risk management in the project cycle, to ensure that the solutions adopted are effective, efficient, and realistic in light of knowledge and capacity constraints.

(ii) To conduct an overview of existing environmental and social policies and safeguards at IDB, and assess whether or not they provide sufficient basis for consideration of climate change in operations;

(iii) To suggest institution-wide approaches that combine mandatory and voluntary instruments to climate-proof[1] operations;

(iv) To suggest a timeline and supporting needs (e.g., finance, capacity building).

The options presented in this paper are not meant to be prescriptive; rather, they represent a stock-taking of the current situation, and an exploration of feasible approaches to move forward with reducing climate risk to IDB operations.

In terms of structure, this paper is organized as follows: The remainder of Chapter 1 touches upon the link between climate change and development and examines climate change projections and some possible impacts for the Latin America and Caribbean region. Chapter 2 examines the ways in which climate change and variability can impact development operations. It also touches upon issues around uncertainty of climate projections. Chapter 3 discusses the "risk-management approach" to development. It touches upon important concepts and definitions, highlights the synergies and differences across climate risk management and disaster risk management, provides an overview of the work being done by other multilateral development agencies, and examines the experience of MDBs in handling climate risk at the project cycle level. Chapter 4 focuses on the IDB context and presents a discussion on the potential for reducing vulnerability to climate risk in the IDB project cycle. Chapter 5 looks at options and needs for moving forward with climate risk management in operations at IDB. Chapter 6 is a summary what needs to be done to move forward.

1.2 Climate Change and Development

Climate Change is Real

There is conclusive scientific evidence that climate change is occurring; the Intergovernmental Panel on Climate Change (IPCC), in its most recent assessment of global climate, stated that "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level" (IPCC, 2007a: 5).[1]

Countries that did not Cause Climate Change still Need to be Concerned

Given that the global climate system has no boundaries, climate change does not only affect those countries that emit large amounts of greenhouse gases (GHGs). In fact, low-emitting developing countries are expected to be among the most adversely affected by the impacts of climate change, partly due to other existing stresses, and partly due to low resilience; many developing countries already experience climatic extremes that, due to financial, capacity, and other constraints, they are unable to cope with adequately. The inertia of the global climate system means that regardless of future efforts made by the international community to stabilize GHG concentrations, "adaptation will be necessary to address impacts resulting from the warming which is already unavoidable due to past emissions" (IPCC, 2007b: 19).

Section 1.3 presents an overview of the projected impacts of climate change in Latin America and the Caribbean.

Climate Change can Affect Development

Climate change can affect national development goals as well as the work of IDB and other international development agencies in the following ways:

> ***Climate change could impede the attainment of poverty reduction goals*** in developing countries by exacerbating existing vulnerabilities and stresses and leading to new ones. For example, a decrease in agricultural productivity due to temperature increases could result in higher malnutrition rates. Annex A provides several more examples.

[1] It is beyond the scope of this paper to provide detailed analysis on the science of climate change and its observed global impacts, or of its contributory causes. For this information, readers should contact IDB staff in the ECC Unit.

Climate change could adversely impact the intended outcomes of development operations in sectors such as infrastructure, irrigation, hydropower, health, natural resource management, and agriculture. Teams engaged in projects in these sectors often analyze long-term climatic trends as part of project feasibility studies. In most cases, the analysis covers only past climate. However, many of the projects and sectoral programming implemented in these sectors can have relatively long life spans of up to several decades. Thus, future climatic conditions have a direct bearing on the anticipated long-term success of the projects.

Broadly speaking, climate change may impact projects through:

- *changes in long-term trends of climatic variables* (e.g., changes in average maximum temperature or in the amount and spatial distribution of seasonal rainfall), and
- *increased climatic variability*, which could result in more severe and/or frequent extreme climatic events (e.g. floods, droughts, severe storms).

Some development projects may need to be re-designed or reconsidered. In some cases project managers may have enough information to know what measures they need to take to build resilience to climate change into their project. In situations where greater climatic variability is a threat, for example, projects might be designed in a more flexible/resilient manner than the business-as-usual case. (In cases where climate change impacts could result in complete project failure, the feasibility of proceeding with the project may itself need to be reconsidered.)

1.3 Climate Change in Latin America: Overview of Key Projections[2]

According to the IPCC (2007c), climate change is manifested primarily through a gradual increase in the average temperatures of the Earth's surface, changes in precipitation patterns, changes in the intensity and/or frequency of extreme climatic events, gradual reduction in glaciers, and a rise in sea levels. There is evidence that long-term historic trends have already begun to change in many parts of the world, and that climatic variability is increasing.

[2] This information is not presented in the full detail and complexity it merits in this Options Paper. Those wishing to find out more should refer to the IPCC 4th Assessment (2007), the UNEP/GRID-Arendal & ECLAC Vital Climate Graphics Study (2010) or seek guidance from the ECC Unit.

The UNEP-ECLAC Study, Vital Climate Graphics for Latin America and the Caribbean (2010), presents the latest scientific knowledge on observed and projected climatic and climate-induced changes for the LAC region, drawing on the IPCC Fourth Assessment Report on Climate Change and other sources. The report states that for the countries of Latin America and the Caribbean, the projected effects of climate change will be significant, despite the fact that the region's emissions of greenhouse gases represent only a small proportion of total global emissions. The information below is taken from this study:

Temperature

Climate projections for the region vary according to the models, scenarios, and country or sub-region

concerned. Latin America and the Caribbean's temperature is projected to increase by between 1°C and 4°C or between 2°C and 6°C by the end of the century, depending on the scenario used, and with variances from one country to another (see Annex B for graphical representation of a set of projections).

Precipitation

Projected changes in rainfall patterns are complex, uncertain, and involve a high degree of heterogeneity. Rainfall regimes vary from one region to another, and also by season. Table 1 captures some of the more consistent emerging projections.

Table 1: Some Projections from Various Models and Scenarios of Changes in Precipitation in LAC

Country or region	*Projected change in rainfall by 2080 or end of century, relative to 1980-1999 average*
Central America	5-10% **decrease** in summer rainfall
Mexico, southern Chile and Venezuela	10-20% **decrease** in summer rainfall
Ecuador, central and southern Colombia, eastern Argentina, much of Peru	5-10% **increase** in summer rainfall
Central America, southern Mexico, northern Venezuela, eastern Brazil	10-20% **decrease** in winter rainfall

Long-term precipitation patterns are of paramount importance to development, affecting water availability, aquifer recharge, agriculture, and plant cover.

Changes in Sea Levels

Changes in sea level are not expected to be geographically uniform. By the end of the century, however, there are expected to be major rises in sea levels in the Caribbean and Atlantic compared to 1980-1999 levels, which, with the exception of the southeastern coast of Argentina and the eastern coast of Brazil, are expected to be as much as 5 cm greater than the projected world average of between 0.21 meters and 0.48 meters (UNEP/GRID-Arendal & ECLAC, 2010). It should be kept in mind that a rise in sea level of even a few centimeters can translate into devastating additional storm surge water volume and impact.

Runoff and Water Availability

The greatest changes projected (between 10% and 30%) will occur in eastern Argentina and southern Brazil, while the most significant decreases (between 10% and 30%) are predicted for Mexico, Central America, and Chile (see Annex C). Declines in runoff could accelerate in dry regions due to reduced rainfall and from higher evapotranspiration rates brought on by a rise in temperature.

Glacial Retreat

Glacial retreat is additional evidence of climate change in the region. The size of glaciers has reduced in Venezuela, Colombia, Ecuador, and Chile, as well as in Peru and Bolivia. Annex D (i) and (ii) provides more information.

Hurricanes and other Extreme Climatic Events

Though uncertainty exists, an increase in hurricane intensity seems to be associated with climate change. Further, in Mesoamerica and the Caribbean sub-region, there were 36 hurricanes between 2000 and 2009, as against 15 and 9 per year in the 1980s and 1990s, respectively. During the last 100 years, 4 of the 12 years with the highest number of hurricanes making landfall occurred in the last decade.

Latin America and the Caribbean has witnessed a recent increase in extreme climatic events, and a rise in the number of people affected (see Annex E). The number of storms between 2000 and 2009 increased by 12 compared to the period 1970-1979 and, in this same time period, floods quadrupled. The number of people affected by extreme temperatures, forest fires, droughts, storms, and floods rose from 5 million in the 1970s to more than 40 million in the most recent decade, both as a result of increased human settlement in the region and due to the increased vulnerability of coastal zones (UNEP/GRID-Arendal & ECLAC, 2010).

Annex F provides a simple indication of some of the expected impacts of climate change in LAC by (i) 2050, and (ii) 2100.

2 TYPES OF CLIMATE RISK POSED TO DEVELOPMENT OPERATIONS

Main messages of this chapter

- The risks posed by climate change to development include (i) Category A impacts, caused by greater variability of climate, which could increase the severity and/or frequency of climatic extremes, e.g., floods, droughts and severe storms, and (ii) Category B impacts, caused by changes in long-term averages of climatic variables, e.g., average maximum summer temperature.
- Of relevance to development operations are two additional categories of threat, resulting in: (i) Type I Vulnerability: impacts of climate on the project itself, and (ii) Type II Vulnerability: the potential of climatic factors to adversely impact the surrounding ecosystem or community through the project.
- Uncertainties and gaps exist with regard to climate projections. However, in many cases various model projections are in agreement, and a general idea of projected change can be deduced. A wide range of tools and guidance are available for sectoral assessments and development work.
- Development sectors that are vulnerable to climate risk include those where climatic variables are used to guide project siting or design, those involving natural resources or ecosystems, and projects involving physical investments, e.g.: water, transport, energy, infrastructure, tourism, agriculture, environment and natural resources, disaster risk management and health.

2.1 Climate Change involves Gradual Change of Climatic Variables as well as Possible Changes in Extreme Events

The two broad manifestations of climate change, both of relevance to the development context, can be categorized as follows:

Category A: Increase in climate-related disasters. A commonly projected and increasingly observed impact of climate change is greater variability of climate. A more variable climate is likely to experience more extremes, which would translate into increased frequency or severity of natural hazards such as intense storms, heavy rainfall, drought, longer and stronger heat/cold waves, and others. These in turn could give rise to floods and landslides, with attendant loss of life, livestock, and harvest if a disaster situation arises.

Category B: Gradual, long-term change of climate variables. Climate change is resulting in gradual long-term change in the trends of key climatic variables, such as changes in mean average, maximum and minimum temperatures, and changes in precipitation amount, onset, duration, and geographic distribution. These changes contribute to follow-on impacts such as glacial loss, sea level rise, desertification, changes in water availability and its timing, changes in crop yields and optimal species mix, changes in the incidence and spatial distribution of pest species and diseases, loss of environmental services, ecosystem shifts, and others.

2.2 Two Types of Vulnerability Posed to Development Operations by Climate Risk

The impacts of climate change—both long-term change and change in variability—can act upon development investments in two main ways: (i) climatic factors may act directly on the project, or (ii) climatic factors may act on the surroundings via the project. Thus, we have two types of vulnerability in the development context:

- **Type 1 Vulnerability:** This situation arises when the development project itself is exposed to either the impacts of extreme climate (Category A risk), such as tourism investment in areas that may see more intense hurricanes in the future; or to long-term changes in climatic variables (Category B risk), such as installation of expensive irrigation systems in cases where hydrological variability or risk is increasing. Both instances are categorized as Type 1 Vulnerability, in keeping with existing terminology at IDB (Disaster Risk Management Policy). **This risk type calls for reduction of risk posed by climate change to the development project.**

- **Type 2 Vulnerability:** This risk arises in cases where the development project itself may pose or exacerbate threats to surrounding ecosystems or communities through the impacts

of climate change and variability. For example, Category A risk in this case could involve a road construction project on a hill slope, which experiences intense rainfall, resulting in a landslide that harms communities. Another example would be a dam project that suffers failure from unusually heavy and prolonged rainfall, with disastrous effects for downstream communities. Category B risk could arise from a project that involves building an agricultural or forestry-related livelihoods base for a community that is based on a species which may not be suited for a changed climate in the long-run. Another example would be building a dam at a location where decreasing rainfall and higher evaporation render the water flow downstream of the dam below the minimum required to sustain the ecosystem. **Type 2 Vulnerability calls for measures to safeguard the systems surrounding the project.**

Table 2 below combines the two main ways in which climate change will manifest with the two main risk categories to provide a broad overview of vulnerability to development operations.

Table 2: Overview of Climate Change Impact Categories, Combinations, and Related Responses

Vulnerability type	Climate change impact on disaster Category (A) risk	Climate change impact from long-term changes in variables Category (B) risk	Response
Type 1 Vulnerability: Planned development project is exposed	Investment is threatened physically	Project's ability to generate benefits becomes diminished	Assure the technical sustainability of the project (and emphasize the economic and financial viability), and fulfill its development objective, by: • supplementing the project with adaptation elements; • protecting the investment by increasing its resilience ; OR • in cases where climate change may lead to project failure despite efforts to increase resilience, reconsider proceeding with project.
Type 2 Vulnerability: Planned development project exacerbates threat for surrounding systems	Increased (disaster) threat for surrounding systems.	Heightened impacts of long term effects of change for surrounding systems.	Safeguard surrounding infrastructure, environmental and social systems against disaster and exacerbated negative long term impacts

2.3 Uncertainties and Information Gaps in Assessing Climate Risk

Climate risk posed to a project is a function of several factors, such as location, current and future climate, number of years the investment is expected to endure, the proposed activities, the resource base at the project site, environmental and socio-economic factors, and existing vulnerabilities. For many development project staff, many of these factors can be estimated. Projected change in climate, however, is often perceived as an area of great uncertainty.

Although uncertainties[3] in climate projections exist, however, there are many cases where enough information is available to take appropriate action. In many instances, a range of models are in agreement on the direction of change of the variable:

- It is generally expected that areas that are currently dry will get drier, and wet areas will get wetter.
- In most cases, variability of climate is increasing, i.e., climate may become more erratic, and events of an extreme nature (heavy rainfall, drought) could become more frequent and/or severe. This calls for resilience-building in project design. In some cases, measures currently being taken may be adequate.
- Sea level is known to be rising.
- Some studies indicate that hurricane intensity will increase along some coasts of LAC.
- Many glaciers are known to be melting and will yield reduced runoff in some years.
- Although there is confidence on the direction of temperature change for many areas of the globe; exact amounts, time profiles and variability are less certain.
- Major uncertainties still exist regarding precipitation projections; in many cases, the direction of change and the time profiles are uncertain.

A wide array of models and tools have been developed to better project and analyze climate change and its impacts on various sectors and in various regions. Development

[3] These pertain, for example, to assumptions and simplifications of climate models, and unclear understanding of some aspects of the climate system, as well as to the emissions scenarios used and the spatial scale of the projections (the finer the scale, the less reliable the projections).

organizations need to not only use these, but also develop or have access to expertise that can interpret the information they contain, and provide technical advice in a form that is relevant to development professionals. In addition, several development agencies are supporting tools that have been specifically developed within a development context, building upon experience in the field.

- The United Nations Development Programme (UNDP, 2010) has published the *Screening Tools and Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance – A Stock-taking Report*, which provides information on a vast range of decision tools, multi-sector and sector-specific tools, and frameworks that are available, and may be accessed at: http://www.adaptationlearning.net/sites/default/files/UNDP%20Stocktaking%20Report%20CC%20mainstreaming%20tools.pdf
- The OECD (2009) document *Integrating Climate Change Adaptation into Development Cooperation: Policy Guidance* provides a comprehensive framework for mainstreaming adaptation into policy and planning processes, emphasizing the need to apply a "climate lens" in order to ensure that climate risks have been adequately considered. The document can be accessed at: http://www.oecd.org/dataoecd/0/9/43652123.pdf

Additional tools and initiatives to minimize climate risk in development are discussed in Chapter 3.

Unfortunately, access to data, information, and knowledge is very limited in some countries, so that even when information exists or has been published, stakeholders often do not possess it. The capacity to interpret model outputs is also often very low in many cases. However, many poor communities are autonomously adapting to changes in climate. They do so through measures such as altered cropping patterns, livelihoods diversification, etc. Efforts are being made in several regions to capture (and where applicable, transfer or adapt) this knowledge.

2.4 Types of Projects and Sectors affected by Climate Risk

Natural resources (e.g., water, agriculture, forestry) are deeply linked to climate, and projects involving investments in these are potentially vulnerable. Infrastructure projects are also potentially vulnerable as they need to be built to perform well under the location's climatic conditions, are generally expensive, and tend to be long-term investments that are likely to witness two to three decades of future climate. With these considerations in mind, we may arrive at the following general list of sectors where physical investments could potentially face climate risk—although analysis would need to be conducted at the project level:

- water resources
- agriculture
- environment and natural resources
- transport
- energy
- infrastructure, including housing
- tourism
- disaster risk management
- health (due to infrastructure elements and projected changes in the incidence and geographic spread of pests and vector-borne diseases);
- education (the project may require buildings to be constructed. Also, schools often serve as storm shelters).

Table 3, excerpted from Baastel (2010), gives a useful indication of the climate-related risks faced in key sectors and sub-sectors.

Table 3: Climate Risks Posed to Key Development Sectors

Sector(s)	*Sub-sector/activity*	*Potential vulnerability*
Agriculture,	Crops	• Increase of frequency and magnitude of extreme

fishing and forestry		events such as droughts, floods, storms • Increase of climate variability suitable for certain crops • Change in time and space distribution of rains • Modification of production cycle duration • Nutrient depletion • Soil salinization • Reduction of crop yields • Increase of soil erosion • Spread of diseases and pests, increase in crop vulnerability to diseases
	Animal production	• Spread of new diseases and pests • Decrease of fodder plant and grass availability • Increase of frequency and magnitude of extreme events such as droughts and floods • Decrease of livestock and fish productivity due to change in climatic conditions (higher temperature, less water availability, increase of water temperature for fish production) • Current species and breeds not suitable to new climatic conditions
	Water management, irrigation and drainage	• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Decrease of water quality and availability • Increase of water evaporation • Decrease of runoff and water supply (due to retreat of glaciers)
	Forestry	• Spread of diseases, pests, and invasive species • Increased incidence of fire

		• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Decrease of forest productivity • Loss of forest biodiversity • Forest soil salinization and acidification
	General agriculture, fishing and forestry	• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Increase of climate variability • Modification of production cycle duration • Nutrient depletion • Soil salinization • Loss of biodiversity • Migration of species • Reduction of crop yields • Increase of soil erosion • Spread of diseases, pests, invasive species • Decrease of fish stocks • Sea level rise in coastal zones and increase of coastal erosion • Decrease of water quality and availability • Increase of water evaporation • Decrease of runoff and water supply
Biodiversity and ecosystems	Natural ecosystems (Terrestrial and Marine)	• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Increase of climate variability • Soil salinization • Loss of habitats • Loss of biodiversity; species extinction • Migration of species

		• Increase of soil erosion • Spread of diseases, pests, invasive species • Sea level rise in coastal zones and increase of coastal erosion • Decrease of water quality and availability • Increase of water evaporation • Decrease of runoff and water supply • Increased pressure on protected areas
Energy sector (adaptation)	Electricity and oil and gas sectors	• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Decrease of stream flows and discharges; increase of evaporation; decrease of energy generation capacity from water use • Decrease of crop productivity used as a bioenergy source • Increased risks of gas and oil exploitation
Industry and trade		• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Decreased availability of natural resources • Decreased availability of energy supply; increased energy prices • Changes in seasonal patterns (rainy/dry season) can lead to road closures and delivery delays, which can affect industry and communities that rely on roads to sell goods
Water, sanitation and flood protection	Flood protection	• Increase of frequency and magnitude of floods • Landslides • Sea level rise • Coastal erosion • Modification of marine currents

	General water, sanitation and flood protection	• Increase of frequency and magnitude of extreme events such as droughts, floods, storms • Increase of disease propagation such as malaria, cholera due to an increase of floods and runoff as well as runoff from poorly constructed latrines • Change in water cycles • Decrease of water quality and availability • Increase of water evaporation • Decrease of runoff and water supply • Lowering of the ground water table therefore reducing available water for hygiene use as well • Increase in soil erosion leading to filling of wells
Transport	n/a	• Increase of frequency and magnitude of extreme events such as floods, storms, cyclones, causing a loss of infrastructure and therefore incurring increased costs • Increased heat and drought frequency can cause heat-rutting, sink holes and heaving in pavements • Decreased capacity of road drains to accommodate an increase of overflow due to increased floods, requiring high maintenance • Soil erosion and landslides particularly on secondary rural routes • Changes in seasonal patterns (rainy/dry season) can lead to road closures and delays which can affect industry and communities who rely on roads to sell goods
Education		• Increase in extreme events could result in decreased access to educational facilities as well as a loss of basic infrastructure (school buildings, roads)

Health		• Heat stress and changing patterns in the occurrence of disease vectors affecting health • Increases in endemic morbidity and mortality due to diarrheal disease • Increased risks of disease outbreaks • Increased risks of food insecurity • Increased pressure on health services
Coastal Zones	Wetlands and coral reefs	• Increase of frequency and magnitude of extreme events such as floods and cyclones • Coral bleaching • Coastal erosion
	Inundation, flood and storm damage	• Increase of frequency and magnitude of extreme events such as floods and cyclones • Sea level rise
	Wetlands loss (and change)	• Increase of frequency and magnitude of extreme events such as floods and cyclones • Sea level rise • Change in marine currents • Coastal erosion
	Erosion (direct and indirect change)	• Increase of frequency and magnitude of extreme events such as floods and cyclones • Sea level rise • Change in marine currents • Coastal erosion
	Saltwater intrusion	• Soil salinization and acidification
	Rising water tables and impeded	

	drainage	

Source: Excerpted from Baastel (2010)

The boxes below present examples of the four general cases of vulnerability and types of risk discussed earlier, that is, extreme events versus long-term climatic change and impacts on the project versus impact on surroundings through the project. This is also explained in greater detail in Annex H.

Box1: **Increased climatic variability and extremes, with project directly impacted**

An example is a project that entails construction of a sea port and associated facilities. Based on historic climate data, the port is designed to withstand hurricanes of a certain intensity. Climate change is expected to increase the intensity of hurricanes and result in stronger windspeeds. It is therefore prudent, when designing and locating infrastructure that is highly capital intensive and to which damage would result in high economic costs, to consider building sufficient resilience into the design that it may withstand more severe climatic events, e.g., hurricanes of a higher intensity. This is particularly important given the long lifespan of ports and some other infrastructure, due to which it is likely to witness considerable change in climate over future decades.

Box 2: **Increased climatic variability and extremes, with impact on surrounding via project**

Many towns and communities living in rural hilly areas need roads for better access. Roads built along hillslopes are at risk from disturbances that may render the slope unstable, and care is taken in siting these at suitable locations. However, in some areas that tend to receive a lot of rainfall or bursts of heavy rainfall, rainfall events may become more frequent, heavy, or prolonged. They may cause unforeseen destabilization of the slope, resulting in landslides and mudslides, and severe consequences for nearby communities. Before embarking on a project in such a location, staff should ensure that the project would be viable (including in terms of its impacts on the surroundings) as climatic conditions become more extreme than the norm.

Box 3: **Long-term changes in climatic variables, with project direct impacted**

An example of such a project is large-scale planting of crop or tree species that will not be suited for the climate of the area in future years. Even though the crop itself may be switched if it fails, this will cause harm to farming communities that are invested in it and have bought seeds, acquired knowledge in planting, sowing and harvesting of the crop, and possibly created agro-industry and other livelihoods activities based on the crop.

Box 4: **Long-term changes in climatic variables, with impact on surroundings via project**

A dam on a river that causes reduction in downstream flow for a critical wetland ecosystem or communities that depend on this flow is an example. In the absence of climate change, technical analysts may conclude that there is both sufficient year-round rainfall and glacial runoff for the downstream flow to be fed by streams and sustain the ecosystem and communities that depend on this flow. However, climate change may shift this balance, in leading to higher evaporation rates, reducing rainfall in some locations, and causing some tributaries to dry up in some seasons. There is thus a threat of the proposed dam project causing critical harm downstream that would not have resulted under baseline climatic conditions.

3 A RISK MANAGEMENT APPROACH TO DEVELOPMENT

Main messages of this chapter

- Adopting a climate risk management approach involves considering current as well as potential future climate risks. It is really about ensuring that investments are robust in uncertain conditions. This approach is being recommended in other MDBs.
- There are synergies across climate risk management and natural hazards risk management.
- The Asian Development Bank, African Development Bank, Caribbean Development Bank, World Bank, European Development Bank and IFC are all engaging in studies and development of processes to understand and consider climate risk in their work.

3.1 What is Climate Risk Management?

An initial recommendation that is reflected in almost all approaches employed in other MDBs as well as in the main policies adopted in recent years is to adopt a risk-based approach. Contrary to the early thinking on adaptation, which often focused on long-term planning for gradual changes in average climate conditions based on model scenarios for 2050 or 2100, current approaches focus on management of a range of climate risks, relating not only to average climate conditions (such as annual average temperature or rainfall) but also on variability and extremes They approach adaptation as an immediate concern that also affects planning for the coming years and decades, rather than only for long-term investments. A risk management approach also explicitly addresses the notion of uncertainty (based not only on future emissions paths but also on limited

data and/or limited understanding of the climate system, as well as inherent variability in the climate system[4]).

A key issue to recognize in such a risk management approach is that climate change is usually an additional consideration to take into account among a whole range of other issues. Thus, the key question is how to ensure it is not ignored where it is important, but addressed effectively where information and options to act on it are available. Proper climate risk analysis may require the use of fairly complex information, which tends to discourage people. Unfortunately, we know that climate change has the potential to have major impacts on development and to individual development investments (e.g. IPCC 2007; OECD 2005).

A key element of a climate risk management approach is not to take adaptation as the starting point, but rather the original investment (or policy initiative). For instance, the OECD Guidance on Integrating Adaptation into Development Cooperation (OECD, 2009) proposes a "climate lens" on development projects, which looks at the following four elements:

- vulnerability: how vulnerable is the project to the impacts of climate change
- consideration of climate risks: to what extent have climate change risks already been taken into account
- climate proofing: can the measure be adjusted to better take into account the risks posed by climate change
- maladaptation: does the measure inadvertently increase vulnerability to climate change

Almost all of the approaches described in the sections below contain these elements in one way or another.

[4] A good analogy is betting on a sports game, say, a basketball game or a soccer match. It is very difficult to predict in advance precisely where the ball will be at any point in time in the game (analogous to predicting the weather far into the future). However, if you have some prior knowledge of the two teams, it may be possible to predict with some level of accuracy the outcome of the game in terms of who is more likely to win or lose, and possibly even the score (analogous to different aspects of the climate that may be predicted with some accuracy some time into the future). Clearly, the ability to make such a prediction depends on the nature of the bet (win/lose, score, who scores, etc.), the information available (statistics from these two teams, which may be more or less helpful depending on whether they play in the same competition) and the relative importance of predictable factors based on the information relative to other factors, including chance (for instance, if one team is last and the other is first in the same competition, the outcome can be predicted with some confidence; if they are close, other factors may become more important (such as who plays a home game, whether key players are fit, previous games, etc.), and there may be a higher element of pure chance. It depends on the circumstances and the information available whether or not it makes sense to bet on the outcome (other than the fun of it), and if so, what information to consider when placing the bet.

Finally, it is important to recognize that adaptation is usually not just about deterministic planning for a quantifiably different future. As stated in ADB (2010a), "In the framework of climate change adaptation, in which uncertainty is inherent, identification of optimal interventions is less relevant than the identification of adaptation measures that are robust to uncertain future conditions. Adaptation planning seeks to identify 'no regrets' and 'low regrets' interventions." Acknowledging this dimension of risk management under uncertainty is essential to arrive at appropriate safeguard strategies that are feasible to implement given data constraints and that result in meaningful project improvements.

3.2 Key Definitions

Adaptation Projects versus Reducing Climate Risk in Operations

Although definitions may vary slightly across organizations, this paper differentiates between adaptation projects and reducing climate risk to operations. We categorize adaptation projects as those projects that are conceived of *specifically* to address anticipated impacts of climate change. Annex G provides an example of an adaptation project, funded by the Global Environmental Facility under the Special Climate Change Fund.

Reducing climate risk to projects, however, involves examine ways in which regular development projects can be protected against adverse impacts of climate change, in accordance with the knowledge available. The focus of the activity is not to reduce vulnerability to climate change, but to ensure that the proposed development project can proceed unharmed (to the extent possible) by impacts of climate change, as well as avoid adverse impacts to surrounding systems.

The following definitions have been taken from the World Bank's online *Adaptation Guidance Notes – Key Terms and Definitions*, as well as from ADB (2005), and are useful in clarifying concepts that will be referred to throughout this paper:

Table 4: Key Definitions Relating to Climate Change Vulnerability Reduction

Term	*Definition*
Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects. Adaptation can be carried out in response to (ex post) or in anticipation of (ex ante) changes in climatic conditions. It entails a process by which measures and behaviors to prevent, moderate, cope with, and take advantage of the consequences of climate events are planned, enhanced, developed, and implemented (adapted from UNDP, 2005; UKCIP, 2003; and IPCC, 2001). *Note:* Some development practitioners include a wide range of activities under the term "adaptation" (i.e., natural resource management, improved access to markets, land tenure, etc.) that, although disconnected from climate risk issues, are considered to indirectly decrease vulnerability/increase adaptive capacity. For the purposes of the Guidance Notes, a measure is referred to as "adaptation" only when it is an explicit response to climate risk considerations.
Climate proofing *(taken from ADB (2005))*	A shorthand term for identifying risks to a development project, or any other specified natural or human asset, as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long-lasting and environmentally sound, economically viable, and socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation, and decommissioning.
Climate risk management	Approach to climate-sensitive decision making that is increasingly seen as the way forward in dealing with climate variability and change and seeks to promote sustainable development by reducing

	the vulnerability associated with climate risk. CRM involves proactive "no regret" strategies aimed at maximizing positive and minimizing negative outcomes for communities and societies in climate-sensitive areas such as agriculture, food security, water resources and health (please see definition of low-regret adaptation strategies below). The "no regrets" aspect of CRM means taking climate-related decisions or actions that make sense in development terms, whether or not a specific climate threat actually materializes in the future (IRI: Climate risk management in Africa: Learning from practice, 2007; p. 10).
Mainstreaming adaptation	Refers to the integration of adaptation objectives, strategies, policies, measures, or operations such that they became part of the national and regional development policies, processes and budgets at all levels and stages (UNDP, 2005). **Note:** In the Guidance Notes, mainstreaming adaptation is sometimes used interchangeably with adopting a climate risk management (CRM) approach. In reality, a slight difference exists between the two terms, as mainstreaming adaptation incorporates consideration of long-term effects of climate change, while CRM focuses on current climate variability and focuses on no-regret measures.
Maladaptation	An action or process that increases vulnerability to climate change-related hazards. Maladaptive actions and processes often include planned development policies and measures that deliver short-term gains or economic benefits but lead to exacerbated vulnerability in the medium to long term (UNDP).

Mitigation[5] (of climate change) *(taken from ADB, 2005)*	Policies, actions, and other initiatives that reduce the net emissions of greenhouse gases (q.v.), such as CO2, CH4, N2O, that cause climate change through global warming.

Sources: http://beta.worldbank.org/climatechange/content/adaptation-guidance-notes-key-words-and-definitions ; accessed on December 21, 2010 and ADB (2005).

3.3 Synergies Across Climate Risk Management and Natural Hazard Risk Management

In adopting a risk management approach, there is a clear overlap with risk management of natural hazards (e.g., Burton and van Aalst, 1999; Mitchell and Van Aalst, 2007; also addressed in the forthcoming IPCC Special Report on Managing the Risk of Extreme Events and Disasters to Advance Climate Change Adaptation). This overlap with climate change adaptation has already been pointed out in some regions heavily affected by both disasters and climate change, such as small island states (by both CDB in the Caribbean, and World Bank and ADB in the Pacific) and several other hazard-prone countries (e.g., the Philippines).

This overlap creates opportunities, as recognized by several MDBs:

- First, agencies may consider integrating adaptation safeguards with those addressing hazard risk management (as promoted within the CDB).
- Second, there is a substantial knowledge base on disaster risk management methods and tools that could be employed to assist in climate risk screening and assessment. This is also acknowledged by several other MDBs (e.g., CDB, 2009; ADB, 2010a).

At the same time there are aspects of adaptation to climate change that are not addressed in a pure disaster risk management context, such as the impact of gradual changes on agricultural productivity or water management (and vice-versa, adaptation approaches of course do not address geophysical hazards such as volcanoes and earthquakes). Nevertheless, recognizing the overlaps and distinctions, an integrated approach might be considered.

[5] It should be noted that in the climate change arena, “mitigation” has a very different meaning than in Disaster Risk circles, where its meaning is more akin to adaptation.

3.4 International Development Agencies and Climate Risk Management

MDBs operate in climate-sensitive sectors such as infrastructure, water, transport, environment/natural resources management, urban development, energy, tourism, health, and disaster risk management. Given that many investments have a long lifespan, consideration of changing climatic variability and trends is important.

Several development agencies have undertaken different types of portfolio-screening exercises to assess vulnerability to climate risk (see Klein et al., 2007 for an overview). DANIDA's climate change screening matrix, UK-DFID's climate and disasters screening tool (ORCHID), and the Dutch Development Agency DGIS's expert judgment approach are some examples.

Several agencies have developed tools geared at project preparation, either with a safeguards perspective, or in a more opportunity-driven mode, to help project developers identify, assess, and address climate risks.

Table 5 provides an overview of these efforts, and includes a look at the private sector.

Table 5: Overview of Key Initiatives on Systematic Climate Proofing in Development Banks

Asian Development Bank (ADB)	ADB pioneered climate proofing methods in the Pacific, including tools for country and project assessment developed as part of the CLIMAP program (ADB, 2005) and including the Climate Change Adaptation Through Integrated Risk Reduction approach (CCAIRR). These tools and approaches have not been formally developed into ADB safeguards. More recently, the ADB's Pacific region has conducted a full assessment of its ongoing portfolio, and is the first of ADB's five regions to develop a plan to climate-proof all vulnerable investment projects (ADB, 2010). The ADB has connected the climate risk management and disaster risk management agendas (ADB, 2008, 2010a). Specifically for disaster risks (including elements of change, but without explicit guidance on this), a non-mandatory screening tool has been tested in Nepal and is now being introduced in three other countries. This

	classifies projects in several risk categories based on a relatively straightforward set of questions (by sector, environment, hazards, exposure, and stakeholder and risk knowledge elements). Additional tools are being developed for next steps, once a project has been classified as high-risk.
African Development Bank (AfDB)	In 2008, the AfDB has adopted a Climate Risk Management and Adaptation Strategy (2008), which, among others, mandates development of a common environmental safeguard standard that incorporates climate change. Further implementation in safeguards is underway, but not yet fully completed. The approach includes linkage to disaster risk management agenda. The safeguards department already developed a gender and climate change mainstreaming checklist (ADB 2009), which aims to provide project managers with a tool for effective mainstreaming of gender in programs and projects related to climate change to: (i) facilitate the identification of gender and climate issues; (ii) provide entry points for mainstreaming of gender-related issues in climate change projects; and (iii) guide project managers to take gender and climate change into consideration when planning, designing, implementing, monitoring, and evaluating projects. In terms of climate proofing, this checklist mainly helps to ask the right questions but does not include formal requirements or technical guidance on how to assess climate risks and weigh their importance.
Caribbean Development Bank (CDB)	The CDB closely links its adaptation work to disaster risk management efforts. This is formalized in the Disaster Management Strategy and Operational Guidelines (2009), which provide a comprehensive approach to disaster risk management and climate change adaptation. It includes mainstreaming into (i) strategic planning; (ii) project cycle; (iii) country strategy papers; (iv) poverty reduction papers; (v) policy-based loans; and (vi) professional capacity building.

	In the project cycle, one aspect is the regular EIA, which can be used to integrate climate and disaster concerns. Guidance is included in the CDB/CARICOM sourcebook on the integration of natural hazards into the EIA process (CDB 2004).
World Bank IBRD/IDA	The World Bank developed several analytical pieces early on, suggesting a climate risk management approach including integration of current and long-term climate risks, and a screening approach to identify high-risk cases (Burton and Van Aalst, 1999, 2005; Van Aalst, 2006). Given weariness about "unfunded mandates" on project managers, the main approach has been to develop the awareness and evidence base and provide tools that can be used to identify risk and adaptation options (e.g. the ADAPT screening and decision-making tool). The approach is opportunity-driven and is using awareness-raising so that climate risk concerns are increasingly integrated in Country Assistance Strategies and sector strategies, and then trickling into project design. To support this process, there is also solid investment in making standardized climate information available (World Bank Climate Change Data Portal), including some disaster data and some socio-economic information.
European Bank for Reconstruction and Development (EBRD)	The EBRD is looking at adaptation, including how to mainstream adaptation into operations including project appraisal and environmental and social due diligence. This may range from developing an approach for planning new and retrofitted infrastructure and other fixed assets to take account of climate risk, including a review of codes and design standards. It may also encompass infrastructure and fixed assets in vulnerable areas, such as coastal zones subject to sea level rise or in areas suffering from water scarcity. Since 2009, the EBRD has been undertaking 12 case studies in all its key

	climate-affected sectors, with a relatively rapid assessment approach (of the order of 5 days of consultant time to analyze a project). The approach is pragmatic and is project-led rather than compliance-led in building the evidence base and identify the best entry points for climate risk management in the project cycle. The results will be used to inform a careful assessment of risk management techniques and options that may be appropriate for the Bank to consider, based on practical experience from a set of real projects that are taken to the EBRD board for implementation (learning by doing). An example is a recently approved water supply rehabilitation project in Tajikistan, where a climate risk assessment identified significant challenges that are being addressed through an add-on grant from the Special Climate Change Fund. This will be complemented, over time, by adjustments in the EBRD environmental and social policies, including compliance and performance requirements. Integration of climate risk management into formal policies does raise competitive issues (EBRD competing with IFC and EIB, for instance). It would be good to develop standards together. In the case of the EBRD, this may come as part of the new EU EIA standards (currently under development by the EC) which would apply to all commercial and non-commercial lending institutions. EBRD's experience is that most climate risk management adjustments in the cases addressed so far are not simply deterministic risk management, such as engineering changes based on specific quantitative trend information from climate data and/or projections. Instead, most cases exhibited a more holistic risk management approach, identifying ways to increase the robustness of investments given potential trends and/or rising risks.

	(Private sector considerations are discussed in a subsequent section.)
IFC (WBG)	The IFC has also undertaken several case studies, but taking a more in-depth approach compared to EBRD, with more detailed examinations of agribusiness in Ghana, hydropower in Nepal, and manufacturing (pulp and paper) in Pakistan. In addition, IFC has examined the risks facing financial institutions (see Annex G). For financial institutions, the IFC analysis notes that these all have their own specific objectives and procedures, and many of the risks listed in Annex1 may already be part of their standard risk-management processes. Rather than creating new instruments for climate-related risks, the challenge is to integrate "investment-relevant information" into existing procedures. This notion of "investment-relevant" information is quite an essential concept, and sets a fairly strict bar on when and where climate risk information can be integrated into investment planning. In its analysis of a set of private sector case studies, where climate change did have relevant implications, the IFC (2010b) notes that "undertaking robust risk assessments for the pilot studies was a complex process, and future improvements will require investment in research at all steps in the risk assessment chain. Until these uncertainties are better resolved, it can be difficult to justify expenditure on physical adaptation actions to clients." (IFC, 2010b) Going forward, IFC will initiate the development of more general tools addressing climate risks and investments, but it is not yet clear how findings from these analytical pieces are feeding into the project cycle. A key entry point may be the upcoming review of IFC performance standards, which may include climate risk aspects (not yet fully decided).

4 KEY ISSUES AT VARIOUS STAGES OF THE PROJECT CYCLE: MDB EXPERIENCE

Main messages of this chapter:

- MDBs are exploring options for climate risk assessment within the project cycle. Safeguards and EIAs can provide useful entry points if they address this risk. Development of tools to monitor and evaluate progress in adaptation is an area of growing interest, although specific tools to assess the success of implementation of climate risk reduction measures do not yet exist.
- Private sector projects face similar sets of issues as well as additional ones. In general, private sector actors tend to be less convinced than governments on the need to integrate climate risk reduction aspects. This ties into financing issues: additional financing is needed to conduct the additional analysis for climate risk posed to the project, and additional funding may be needed to adjust the project to reduce any identified potential risks.
- Common barriers and constraints to better integration of climate risk reduction at the project level in MDBs include lack of awareness or technical expertise, as well as absence of strong supportive methodologies, tools, and data.

4.1 Project Preparation and Analysis

All MDBs agree that effective climate risks need to be identified early on in the project cycle in order to be effectively integrated, for instance as part of feasibility studies, so that a wide range of alternative options can be weighed as an integral part of overall project design.

4.1.1 Using Safeguards or EIAs as Entry Points for Project Assessment of Climate Risk

In terms of further project analysis, several EIA/ESIA guidelines already include entry points for climate risk assessments. For instance, several EIA guidelines already mention hazard analysis, although mainly to assess risk that the project may pose to the environment during a hazard event, such as environmental spills, rather than risk of environment to the project and/or its outcomes. When they do, the EIA policies are mostly rather unspecific in terms of specifying how a risk assessment should be conducted.

In some cases, there is a close link to the standards in the countries or regions where the MDBs operate. When countries have their own stringent EIA guidelines that already include climate risk management, MDBs can simply follow that practice. In other cases, the country standards may be more limited than a comprehensive risk assessment as part of the EIA, but may

include relevant sub-standards, such as good building codes (which may or may not yet be adjusted to changing climate conditions).

In the case of the EBRD, EU EIA guidelines automatically apply (and also provide a level playing field among different financial institutions operating in the same market).

For private sector operations (but possibly even for sovereign lending), this notion of a level playing field is becoming an increasing concern: if some MDBs adopt more stringent climate risk management requirements than others, they may be seen as having a comparative disadvantage in the eyes of their potential clients.

4.1.2 Board Approval of Project

In terms of compliance at the stage of board approval, none of the development agencies already has a fully-fledged safeguards policy on adaptation that needs to be fulfilled. However, there are many cases where board members have asked critical questions when such concerns had not been addressed. Screening tools, with some standardized follow-up process for high-risk cases, will be an easy way for project managers to respond to such concerns, even when no formal policy has been adopted and no formal compliance is required.

4.1.3 Project Implementation

No MDBs have specific tools to monitor climate risk management during project implementation, if those aspects are not yet integrated in the regular project design aspects that are monitored as part of regular supervision.

It would be useful to develop ways to better manage evolving climate information into project implementation, for instance by supplying guidance and/or information sources to implementing agencies and/or contractors. Many investments may benefit from better use of climate information on a range of timescales (not only long-term climate scenarios but also near-term climate projections and seasonal forecasts) to map operational climate risks for the upcoming months and years, and possibly even “regular” early warning for hazardous conditions (e.g., IRI).

4.1.4 Monitoring and Evaluation

There is rapidly growing interest in measuring progress on adaptation. These approaches typically involve a combination of outcome and process indicators.

So far, there is little experience in long-term monitoring and evaluation of systematic climate risk management in MDB operations; success is typically being tracked in terms of numbers of projects that have been climate-proofed and/or business volume specifically addressing adaptation (including additional grant financing).

As an example, the CDB's Disaster Management Strategy and Operational Guidelines includes output indicators on Outcome 2 (DRM and climate change adaptation (CCA) effectively addressed by CDB):

Output: DRM and CCA mainstreamed within CDB

- number of technical assistance projects directly addressing DRM/CCA
- number of capital projects including specific DRM/CCA measures
- number of country strategy papers addressing DRM and CCA issues
- number of professional DRM/CCA capacity building interventions
- number of ERGs and IRLs where 70 percent or more of the initial amount requested is actually disbursed.

A wider (but similar) range of indicators is included in the AfDB's Climate Risk Management and Adaptation Strategy.

When MDBs do have some safeguards addressing climate risk already, this typically is more of the nature of a checklist—it is at project managers' discretion whether that safeguard is triggered. However, several MDBs are currently in the process of developing more elaborate guidance, with closer links to sector experience. In some cases, a process is underway towards formal integration of climate risk management into the full EIA/ESIA guidelines.

Application of safeguards on climate risk management can be one of the sources of information for monitoring and evaluation of adaptation efforts. This by-product of the safeguards procedures should be considered in its design.

Note that a growing number of countries are also implementing their own adaptation plans, which may also include monitoring and evaluation. It is recommended that IDB and country M&E in this regard are aligned where possible.

4.2 Specific Private Sector Considerations

Private sector investments are affected by a range of climate-related risks (see Figure 1), somewhat similar to government projects, but including a different, or at least additional, set of

considerations.[6]

Figure 1. UKCIP classification of climate-related risks facing the private sector (UKCIP, 2010)

In the case of public utilities and other semi-governmental agencies, there is usually some willingness to integrate longer-term considerations for substantive reasons. In the case of pure private sector operations, the EBRD experience does not yet point at strong willingness to borrow for additional climate risk management requirements. This should of course be different when the case can be made not on the basis of sustainable development and increased resilience of societies, but in terms of the short-term bottom line of the business at stake.

But for now, two key concerns come up, both related to the financing of the additional costs:

[6]An additional perspective on private sector risk management comes from the UK, where a specific new element is the climate change legislation (similar climate change laws are under development in several developing countries as well). This creates yet another dimension to private sector climate risk management. The intention of the Climate Change Act 2008 is to create a framework for building the UK's capacity to adapt. Under the Act, the UK Government requires public authorities and some businesses such as utilities and transport operators to report how they assess and manage the risks of climate change. UKCIP notes that this mandate presently covers only 90 companies, but that its influence could extend much further through supply chains.

- First, in terms of the process of doing the additional analysis to ensure proper climate risk management during project preparation and appraisal. While many government counterparts are interested in integrating climate risk management considerations, private sector actors are often not convinced. So far, the additional costs of performing ESIA include climate risk management (often adding of the order of 25 percent to the cost). In the case of EBRD, these costs have so far been borne by EBRD rather than the client (whereas normally, ESIA costs are the client's responsibility).
- Second, in terms of the additional finance needed to implement the recommended adjustments. When additional investment is required to address climate change concerns, few private sector clients are willing to borrow, so there is a need to explore modalities to add grant financing (e.g. in the case of privately managed infrastructure, such as port facilities).

This is one area where the lack of safeguards is currently hampering progress: it is sometimes used against MDBs that may wish to push for stronger climate risk management integration into projects (clients are arguing that the MDBs cannot impose these standards given that they are not in their policies). However, given clients' reservations, the case needs to be made convincingly (and this may require further experience building as well as being somewhat selective in choosing high-risk cases to engage first), and any formal requirements would ideally be applied in similar ways by all competing financial institutions. It should be noted that opportunities can also become risks, namely, if a particular company does not take advantage but its competitors do.

4.3 General Barriers and Constraints

4.3.1 Awareness, Human Resources

Many MDBs have commented on the need to have sufficient awareness and expertise, not only in central departments but also within the sector teams, to appreciate the opportunities. This may require investments in internal networks and training, as well as practical tools such as consultant rosters.

4.3.2 Methods/Tools/Data

There are essentially two approaches to integrate climate risk management into safeguards policies. One is to simply require project managers to tick boxes in checklists: (a) is the project at risk and (b) if so, has the risk properly been managed. Implementation then relies purely on project managers' due diligence. The other is to formally require some sort of scoring or set specific standards to assess risks, especially in relation to the initial screening that determines if further in-depth work is needed. Such an approach (although still including some qualitative assessments in its list) has been taken by the ADB for its draft hazard risk screening, and in a more quantitative way by the World Bank in its adaptation tool.

In the latter case, but even for more informal screening approaches, it is advisable to provide clear guidance on preferred methods and data to use, so task managers can be assured that their approaches won't be questioned by their clients (or managers) and the institution at large can be assured that similar standards are being applied across different projects and sectors. Except for the World Bank, none of the MDBs currently have such standardized dataset and tools for recommended use, but several have expressed the desirability of having them.

4.3.3 Opportunities

Several MDBs commented that it is very important to first focus on low-hanging fruit to build experience. This may include a focus on high-risk cases, looking for synergies with current variability and extremes, and/or looking for investments that have long lifetimes and involve irreversible decisions.

5 THE POTENTIAL FOR REDUCING VULNERABILITY TO CLIMATE CHANGE IN THE IDB PROJECT CYCLE

Main messages of this chapter

- Studies of IDB's investment lending portfolio have identified that climate risk is a concern. At the same time, climate change has been identified as a key priority at IDB, and there is thus institutional willingness to address this issue.
- This can be done by mainstreaming methodologies and technical recommendations in operations, sectoral work and national strategies, as well as through application of operational procedures and documents for various stages of the project cycle, provided they address climate risk issues. A collaborative effort involving both approaches holds promise.
- The Environmental and Social Safeguards Compliance Policy (Directives A.3, A.6 and B.4) have potential to address climate risk, as does the Disaster Risk Management Safeguard and Policy (guidelines 1.7 and 1.8 and Policy Directive A-2).
- Rigorous analysis is conducted of historic climatic trends in project concept and design, but–apart from occasional exceptions–possible future change in climate is rarely considered, even though the projects may have long lifespans.
- It is equally important to address climate risks in private sector (non SG) operations, although this involves additional considerations.

5.1 Institutional Framework Exists; Willingness Needed

- Climate change, environment, and food security have been identified as key priorities for the development agenda for Latin America and the Caribbean over the next decade.
- IDB's latest capital replenishment sets a goal of 25 percent of investment lending targeted at climate change initiatives, renewable energy and environmental sustainability, by 2015 (up from 5 percent over 2006-2009). This includes adaptation measures.
- IDB has prepared a "Draft Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy" (26 October 2010), which is expected to be adopted in March 2011.
- IDB board members have expressed concerns about vulnerability to climate change in project approval meetings.

In short, the institution has demonstrated commitment to engaging in climate risk management activities. However, staff willingness and capacity are needed.

5.2 Vulnerability of Projects in Portfolio

- Studies by Iqbal (2006) and Baastel (2010) indicate that IDB's investment lending portfolio is potentially highly vulnerable to climate risk in some sectors and that this should be addressed in order to reduce financial risk ensuing from possibly lower/poorer project performance. Development agencies also have a responsibility to ensure that the services being provided are sustainable to the extent possible.

- These findings are in keeping with similar assessments conducted by the World Bank and OECD, which reveal that a significant proportion of investment lending is at potential climate risk.

5.3 Approaches to Addressing Vulnerability to Climate Change at IDB

5.3.1 Addressing Vulnerability through Mainstreaming Efforts of INE/ECC

The Sustainable Energy and Climate Change unit (INE/ECC) of IDB is tasked with mainstreaming climate change adaptation across development sectors. The strategy includes:

1. Mainstreaming adaptation into IDB's operations: this is a technical cooperation study (TC) on reducing vulnerability to climate change through incorporation of adaptation in the planning process, for which the following activities are underway:

    - A review of the IDB's project portfolio to identify operations sensitive to climate change and then develop a methodology to integrate consideration of climate change throughout the project cycle
    - List of adaptation options for key sectors
    - Vulnerability maps
    - Identification of funds available

2. Mainstreaming adaptation into sectoral, sub-national and national planning

3. Mainstreaming adaptation into national and regional planning

5.3.2 Addressing Vulnerability in the Project Cycle through Operational Documents and Procedures

There are numerous opportunities for addressing vulnerability in project cycle processes. These are broken down along the lines of identification of vulnerability/risk, subsequent adjustments and amendments as necessary to the project, and supervision.

- It is desirable for vulnerability to be addressed and identified at the **project idea stage.** This could be done through policy or sector dialogues with countries or, in the case of the private sector, in project proposals from private sector sponsors, which are often better elaborated.
- The IDB project cycle provides **numerous potential opportunities** to address vulnerability to climate risk. These actions would fall within the domain of the project team leader; although in most cases support would be provided by the Safeguards Unit and the climate change mainstreaming support at ECC.

Various possibilities include addressing climate risk in:

Project eligibility/identification phase (leading to Project Profile/Project Abstract):

- ✓ Environmental and Social Safeguard Screening Form (to include questions on climate risk)
- ✓ In Environmental and Social Strategy (ESS) and in Environmental and Social Review of ESS
- ✓ EIA, to be prepared by sponsor, should include analysis of climate risk

Project preparation and analysis phase:

- ✓ Assure climate proofing in technical, economic, and financial analysis by defining appropriate ToRs and selecting technical experts that have the ability to consider vulnerability and alternative project designs.
- ✓ TORs for ES expert should include consideration of climate proofing, if applicable

- ✓ Include relevant section in Environmental and Social Management Report (ESMR) if needed (based on prior assessments/identification of climate risk)
- ✓ Include climate risk identification and proofing in TOR of independent experts of non-SG projects

Project approval phase:

- ✓ Inclusion of climate risk issues and solutions in documents associated with the Proposal for Loan Approval (PAL) or Proposal for Operational Development (POD), for SG operations
- ✓ Inclusion of climate risk issues and solutions in documents associated with the Loan or Guarantee Proposal (LGP), for non-SG operations

Project implementation phase, including execution and supervision:

- ✓ Ensure that measures to mitigate climate risk issues are adequately discussed in environmental and social sections of the Project Performance Monitoring Report (PPMR) and Loan Results Report (LRR), for SG operations
- ✓ Ensure that the Project Supervision Report (PSR) documents related to environmental and social issues address measures for mitigation of climate risk issues previously identified, for non-SG operations

M&E:

- ✓ Ensure that measures to monitor climate risk reduction are included in the Environmental and Social Project Monitoring Plan, and are included in the ToRs of environmental and social monitoring consultants
- ✓ Ensure that any climate risk issues that were identified are examined in the Semi-Annual Review
- ✓ Ensure that measures to mitigate climate risk are assessed in the Environment, Social, Health and Safety Audits

Annex J (a), (b), and (c) provide a more detailed breakdown of such options for SG and non-SG operations.

5.3.3 Existing Policy Directives with Potential for Addressing Climate Risk

There are at least two pathways for addressing vulnerability in the currently existing safeguard framework of IDB. It can be accessed through the *Environmental and Social Safeguard Compliance Policy* as well as through the *Disaster Risk Management Policy*.

- ***Environmental and Social Safeguard Compliance Policy*** (OP-703) from 2006, and its Implementation Guideline (2007):

  - ✓ **Policy Directive A.3, on Mainstreaming Environment across sectors**, specifies that the Bank "will finance…activities across different sectors, beyond required environmental mitigation actions to increase value added and long-term sustainability." It cites the IDB's "do no harm" approach to development and calls for the strategic integration of environmental and sustainability concerns: "At the program/project design level, project teams may discuss with the borrower all feasible alternatives to increase the benefits and sustainability outcomes of their operation, which can be addressed by incorporating specific environmental components and activities into the design of the operations." This Directive would address Type I and Type II cases of impact.
  - ✓ **Directive A.6, on assessing Environmental Risks and Opportunities**, states: "The Bank may adopt a risk management approach to anticipate precautionary measures." On Procedures and Implementation, this Directive explicitly identifies 'Vulnerability to natural hazards/climate change' as one of the "sources of risk that can have significant implications in the Bank's country strategies." Project managers potentially could use this Directive as the basis for climate risk management across operations, as it calls for "working to harmonize environmental procedures and safeguards." This may be applied for Type I and Type II cases of risk.
  - ✓ **Policy Directive B.4, pertaining to Other Risk Factors,** states: "As part of the screening process of an operation (see Directive B.3), project teams will also identify if there are any potential key or significant *risk factors* other than

environmental and associated social impacts that may threaten the environmental viability of the operation."

- ***The Disaster Risk Management Safeguard and Policy*** may address the risk posed by the impacts of climatic extremes (severe storms, floods, etc). Of concern here, however, is the fact that the nature of these extreme events is expected to change; a higher proportion of hurricanes may be of greater intensity, and the timing and amount of seasonal flooding may change (e.g., earlier warming in Spring with high levels of glacial melt). In recognition of this, the IDB's Disaster Risk Management Policy Guidelines (which are intended to help Bank teams and members implement Bank actions according to the principles of the Disaster Risk Management Policy) state:

  - ✓ 1.7 The present guidelines apply to all natural hazards, including the hydro-meteorological hazards—windstorms, floods and drought—associated with both the existing climate variability and the expected change in long-term climate conditions. Of note for risk assessments, climate change is expected to change some countries' disaster risk (their probable losses) by changing the characteristics of the hydro-meteorological hazards.
  - ✓ 1.8 Although uncertainty persists, recent advances in downsizing models are allowing disaster managers to better calibrate their risk assessments to understand potential impacts due to climate change at the sub-national level. Tools for identifying such climate risk at the country and project levels and measures for mitigating these increased risks to Bank investments (climate change adaptation) will be developed under Pillar 4 of the Bank's Sustainable Energy and Climate Change Initiative (SECCI) Action Plan.

  Thus, the DRM Policy provides a basis for considering the potentially increased risk posed by disasters to operations as a result of climate change. It also looks at both impacts on the project and on the surroundings:

  - Under Policy Directive A-2, on Risk and Project Viability, two types of disaster risk scenarios are identified: Type 1 – projects that have a high exposure to natural hazards; and Type 2 – projects that show high potential to exacerbate risk.

5.3.4 Summary: Addressing Vulnerability in Practice at IDB

- Consideration of climatic and climate-dependent variables that are important for the project's long term economic viability (category B, Type 1) is common practice in the cost/benefit and financial risk analysis of the project.
- At present rigorous analysis of **historic** climatic factors is done for project design (e.g., by examining average maximum temperature over the past several decades, or examining variability based on past occurrence of extreme events). Given that climate is changing, however, analysis based on historical data can no longer be representative of future trends. Thus, assessment of likely future climate is not satisfactory.
- There are occasional exceptions, e.g., the Trans-Jamaica Highway Project, for which analysis of climate risk was included in the ToRs of the environmental engineer, and an effort was made to prepare for anticipated changes in climate (e.g., by planning for hurricanes one category more intense than would normally have been planned for). There are also projects that contribute tow adaptation, such as making improvements to hydrological information systems, which would enable better management of vulnerable watersheds.
- Discussion with ESG experts and ECC indicate that climate risk management is viewed as a priority. However, some experts emphasize the need for data and refined model results in order to do this.

Table 6 summarizes information from previous sections to give an overview of the existing opportunities across IDB to address vulnerability in development projects:

- Safeguard policies could conceivably address the impact of the project on surrounding systems (Type 2, green color) including the (exacerbating) impact.
- Disaster Risk Management policy covers both the impact of climate change on the project as well as projects' impact on surrounding systems (Column A); however, it will need to be implemented more broadly, to account for changes in disaster severity and frequency.
- Case 1-B should be covered by provisions relating to responsible economic and financial planning, i.e., within the framework of appreciation of risks: f*inancial*

analysis without pass-through of climate risks (as with hydrological risk). It can be systematically requested as a safeguard under Other Risks (B4).

Table 6: Types of Climate Risk to Development Projects

Type of Impact (direction)	**Climate change impact category**	
	Increase in climate-related disasters (A)	**Changes in long-term trends of climate variables (B)**
Impact of climate change on project **(1)**	Protect the investment by making it more resilient	Assure the economic and financial sustainability of project
Impact of project on surrounding socioeconomic & environmental systems **(2)**	Safeguard (disaster) resilience of surrounding infrastructure, environmental and social systems	Safeguard against exacerbation of change impacts

ECC's efforts to mainstream adaptation in operations, and the existing environmental, social, and disaster policy directives, which provide a solid basis for moving forward on climate risk reduction, indicate promise for a collaborative approach for reducing vulnerability in IDB operations.

5.4 Differences and Implications for Private Sector Lending

As mentioned in Chapter 4, increasing resilience to climate risk in IDB's private sector operations involves a few additional issues:

- Data and information needs are more stringent.
- There is delayed entry into the project cycle (relative to SG), with many of the technical studies already conducted before formal IDB entry. This has implications for climate risk management at the project conceptualization stage.

- Due to the need to remain competitive with other financial institutions, IDB generally chooses to work in parallel with measures being taken by other IFIs (rather than be 'ahead of the curve' and thus risk being a less pleasing option for investors).
- Discount rates are higher for private sector operations.

However, according to IFC (2010c), a range of risks can be incurred by to consider the risks posed by climate change to private sector investments, including:

- credit and financial risks
- strategic risk
- reputation
- operational risk
- legal risk

5.5 Interim Conclusions

- A framework exists at IDB for engaging in climate risk reduction in operations.
- A significant portion of operations in IDB's portfolio may be vulnerable to climate change, which is not systematically addressed in the majority of cases.
- Within IDB, capacity is low for proceeding with this.
- Safeguard policies (Disaster and Environment) exist that would cover much of the issue, but may need further scoping/elaboration and implementation. If safeguards are used, it would be worthwhile to establish a good system to monitor their implementation for addressing climate risk, assess consistency in the application of the guidance, and track progress over time.
- The project cycle includes numerous steps and operational documents where vulnerability to climate risk could potentially be addressed, such as composition of project team, safeguard screening form, ESS, EIA; ESMR; selection and ToRs of technical experts; economic and financial analysis, and review processes of ESMR. Measures to address vulnerability to climate change are not yet systematically incorporated in these steps and documents. Doing so, however, would require careful thought and elaboration of requirements and guidelines.

- Efforts to mainstream adaptation in IDB programs and projects cover a wide spectrum of tasks and activities, including addressing vulnerability at the country policy level (being done by INE/ECC). These efforts are just beginning.

- IDB sector units are making efforts to address climate risk. In most cases, however, this applies to *current* climate risk only.
- Climate risk management is also needed in private sector operations (non-SG). A few additional issues arise with regard to climate proofing, but the potential financial risk posed is a large concern.
- Climate risk management is an area that concerns all development agencies. Various organizations are engaged in pilot studies on this issue and formulation of policies and guidelines. The IDB should suggest the formation of and take part in a small informal working group comprising multilateral development banks and other funding agencies that shares experiences in climate risk management. Participation from each institution should be limited to two to three experts.

In sum, there is institutional intention to address climate risks posed to operations. Existing safeguards can be more comprehensively applied, and mainstreaming efforts are underway. Technical staff in various sector units are also engaged in relevant activities. It should be ensured that these efforts are complementary.

6 OPTIONS AND NEEDS FOR A COMPREHENSIVE APPROACH TO ADDRESSING VULNERABILITY TO CLIMATE RISK AT IDB

Main messages of this chapter

- With the objective of increasing the resilience of its operations to climate risk, options are needed to move IDB from a situation where few projects are screened for climate risk to one where the portfolio largely comprises SG and non-SG projects that are climate-proofed.
- To meet this objective, the following three complementary approaches are needed:
  - *Policies and safeguards:* (i) existing policies and safeguards, if interpreted broadly, could be used to support climate proofing, or (ii) a new policy could be formulated on climate risk management, or (iii) the issue of climate risk can be mainstreamed across existing environmental, social and disaster safeguards.
  - *Mainstreaming advice:* The policy approach needs to be supported by tools, guidelines and methodologies to aid in mainstreaming adaptation and climate risk management.
  - *Sector-specific expertise:* Sector Units need to develop sector-specific toolkits and incremental cost calculations, as well as to determine initial case studies to gain insights and lessons.
- Initially, at least, financial incentives may be needed to support the climate risk management process, especially to cover any incremental costs (if any) of making the project more resilient.
- Awareness-raising and capacity building are crucial, as is determination of data and knowledge needs, and their provision.
- A phased approach is needed that sets realistic goals for various timeframes, and builds on preceding action.

6.1 Potential Objectives and Indicators

Tentative objective: IDB operations are resilient to climate change

Tentative Indicator: 95 percent newly approved IDB projects are climate-proofed by 2015

There are three possible cases for the project cycle/portfolio with respect to climate risk management:

a) Projects are designed with the specific aim of being adaptation projects.
b) Climate risk is adequately addressed in project proposals for all investments in vulnerable sectors (ideas, concepts or other project documents) presented to IDB by countries and private sponsors.

c) Climate risk is not addressed properly; climate proofing must be achieved through actions of specific, trained IDB project staff and support.

Currently the most frequent case is c). Over time, however, the relative proportions of a) and, perhaps more importantly, b) are expected to increase due to efforts being made in mainstreaming adaptation and climate risk management. This is happening through awareness-raising and capacity building at the country and sector levels as well as in regional work.

Eventually, c) will become less necessary. **How to make this happen is the subject of this options paper.**

6.2 Potential Lines of Action for Addressing Vulnerability in the Project Cycle

6.2.1 Axis 1 - Apply, Implement, and Reinforce DRM and Environmental Safeguards

There are three options:

(i) *Using existing policies:* Section 3.3 shows that policy and safeguard instruments exist at IDB that could cover climate risk by (i) being applied voluntarily, or (ii) being interpreted in a broad sense and applied in a mandatory way. To reiterate:

- ✓ The Disaster Risk Management safeguard and policy addresses the risks posed by the impacts of climatic extremes (severe storms, floods, etc.) both directly to the project and via the project on the surroundings. The policy's guidelines (1.7 and 1.8) explicitly refer to climate change.
- ✓ Directive A.6 refers to assessing environmental risks and opportunities across sectors.
- ✓ Directive A.3 (Mainstreaming Environment) cites the IDB's "do no harm" approach to development and calls for the strategic integration of environmental and sustainability concerns.

(ii) *Formulate new policy on climate risk management:* Instead of utilizing existing policies (above option), a new safeguard policy could be formulated on managing climate risk.

This would require major efforts on all levels and also necessitate adjustments to existing policies, which already deal (at least partly) with the issues.

(iii) *Mainstream climate risk management across all ESG safeguards:* This third option would result in all existing (relevant) environmental and social safeguards to explicitly call for consideration of the impacts of climate change (without creating a separate, new policy).

6.2.2 Axis 2 - Tools and Guidance to Aid in Adaptation Mainstreaming

Efforts to integrate adaptation/climate risk management concerns in operations will need to be embedded within a larger inter-departmental mainstreaming effort that includes information provision and generation, capacity building and awareness-raising, and monitoring, to achieve the following:

- For vulnerable countries, climate risk receives due attention in country dialogues and is flagged as an issue of concern in country assistance strategies/programming.
- Climate risk receives consideration in sector strategies, for relevant sectors.
- Training programs are conducted for Bank and country management staff explaining the risks posed by climate change to development in LAC.
- Tools, information and data on climate model projections, vulnerability maps, and others, and their interpretation are made available at country and sector levels.
- Tools that examine climate change in a development context are available to staff and, if necessary, adapted for IDB purposes.
- Information on funding opportunities for adaptation/climate proofing are made available to all Units.
- Procedures are developed and instituted to monitor key documents (at country, sector, and project level) and project milestones (e.g., at ESMR) to check for inclusion/recognition of climate risk issues. Over time, this process can yield useful indicators for changes in institutional awareness and attention.
- Experiences, ideas, and approaches on climate risk management are shared in informal brainstorming sessions with experts from other MDBs.
- It would be desirable to establish procedures to track the amount of incremental funding that specifically relates to efforts to climate-proof operations.

6.2.3 Axis 3 - Sectoral Approaches

With the policy framework in place (Axis 1) for consideration of climate risk, and with climate risk being increasingly mainstreamed through strategic efforts such as country programming (Axis 2), it will also be important for the (climate-sensitive) Sectors to take initiative and identify specific needs and appropriate solutions for their unique climate risk concerns.

- Climate-sensitive sectors should develop tools, checklists and guidance notes to provide sector-specific information to project staff. Examples include:
    - ✓ Guidance notes that clearly lay out how climate change could pose risk for projects in a particular sector (e.g., see World Bank's Guidance Note on Mainstreaming Adaptation in Agriculture and Natural Resource Management Projects: http://beta.worldbank.org/climatechange/content/mainstreaming-adaptation-climate-change-agriculture-and-natural-resources-management-project
    - ✓ Comprehensive checklists or guidelines for climate risk identification
    - ✓ Advice on where to access databases of climate data and projections
    - ✓ Advice on how to climate-proof projects
    - ✓ Rough guidelines for calculating the incremental costs for climate proofing various project types
- Conduct selected analytical case studies, looking at:
    - ✓ sectors that are highly vulnerable
    - ✓ projects that have long lifetimes
    - ✓ projects in which climate risk poses high financial risk, or
    - ✓ where good opportunities are presented

The IDB should aim at raising institutional capacity so that all climate-sensitive Sectors eventually house expertise on climate risk issues (each Sector should have a focal point for advice on climate risk issues). Initially, IDB may consider seconding technical staff from other development organizations that are skilled in these approaches.

Encourage reconsideration of practices that are potentially risky, such as approving loans in advance of completion of preliminary studies (this is a particular issue for Conditional Funds, for example, which need to be approved within the year of release).

In several cases the technical guidelines and standards for projects are left up to in-country consultants. IDB Sectors Units may explore options for integrating climate risk issues in the consultant ToRs.

6.3 A Complementary Integrative Approach

6.3.1 Combining the Three Axes

It is clear that the three lines of action discussed above complement each other and together constitute a comprehensive approach to addressing climate risk. Although the focus of this Options Paper is to identify ways to climate-proof all physical investments (individual projects as well as multi-project programs), this process cannot be done in isolation; its success lies in its being done in parallel with other activities that are part of broader mainstreaming efforts, alongside capacity building and development of technical expertise on climate risk issues among Sector Units.

6.3.2 Required Supplementary Provisions: Incentives and Funding

- For some projects, measures to increase their resilience to climate change may raise their cost. Additional funding will be required to cover the incremental amount (preferably, grant funding). With the emphasis on climate change and sustainability in IDB's latest replenishment, this may be possible in some cases.
- Soft lending options may be explored for IDB to work with client countries towards screening their pipeline and selecting some (potentially highly vulnerable) projects for detailed studies.
- It is worth considering the establishment of an "incentive system" that encourages project managers to invest the time and effort it takes to address climate risk management.

6.3.3 Capacity Building and Tools

Awareness-raising and capacity building will be crucial. Managers and technical experts alike will need to be made more aware of potential climate risks to the IDB portfolio, after which they will need to be supported with guidance, methodologies, data, and access to expertise. The Knowledge and Learning Unit is engaged in awareness-raising. In order to be most effective, targeted workshops may be needed focusing on sub-region, sector, and others.

IDB departments also need to decide strategically what kinds of tools and methodologies are needed. What can be developed by staff? Which aspects may need outside expertise? What kinds of data and model outputs should be made available? Will staff be able to interpret them?

It is important to note that capacity also needs to be built within client country governments and private sector counterparts, in order for the desire for climate-resilient development to be demand- and client-driven.

Indeed, ideally a growing portion of the safeguards role would eventually shift to client countries (for government projects in terms of its own implementation, for private sector operations in terms of its regulatory role). These considerations could be built into the safeguards development strategy.

6.4 The Option of a Phased Approach

A phased approach (over time) to climate risk management is likely to prove successful and productive, as it allows the gradual development of awareness (and thus demand and uptake). Table 7 provides an indicative roadmap.

Table 7: A Roadmap for Moving Forward on Climate Risk Reduction in IDB Operations

Timeframe	*Activities*
First 6 months	• Build awareness of climate risks to investment lending (through seminars, trainings), including in country offices and among clients. • An initial awareness-raising action (suggested by V. Stenek, 2010) would also be to include a question on climate risk in the ESG Safeguards Screening Form, e.g.: Have you looked at financial risk to the project stemming from climate risk? ☐ Yes ☐ No If no, please state why: [ ] The form should include some explanatory text about climate risk and its threat to financial viability of the projects. (At this preliminary stage, project staff would not be obliged to climate-proof all their operations even if risk is identified.) • Strategize about possible **incentives** that can be used (on an initial, temporary basis) to encourage project managers to engage in climate proofing. • **Start** pilot climate proofing of operations by: ✓ Selecting **priority** activities in 2-3 infrastructure or NRM intensive sectors ✓ Using **existing** risk assessments and **modifying** these to indicate climate change (e.g., adopt approach of planning for hurricanes that are one category **above** the intensity experienced on average currently for projects at a hurricane-prone location)

	✓ Planning for some degree of sea level rise (and higher storm surges) in coastal projects ✓ Planning for increased variability in the timing and availability of water, for hydro and agriculture projects. *The idea is to work over this six-month period with what is easily available in terms of model scenarios and projections, and using methodologies and assessments that are already in use, while institution-wide standard sets of projections and methodologies are being developed.* • **Appoint** a technical advisor/go-to person that can advise Sectors on climate proofing.
6 months – 1 year	• Provide checklists and guidance documents (and other support for voluntary measures) to help identify sources of risk at sector level (work with sectors to develop these). • Advanced sector-specific trainings on climate risk for project staff. • Institute an incentive system to reward project managers for taking measures to reduce climate risk to their projects. • Select institution-wide sets of climate change projections to be used, based on a range of model outputs. • Each sector to appoint a point person on climate risk issues. • Set up a tracking system to monitor progress towards climate risk management in projects, even if informal to start with.
Within 1.5 years	• Develop and explore access to relevant tools, knowledge bases, and data and information sources that will help with institution-wide efforts in climate proofing. • Sectors will start developing their own individually tailored procedures for climate proofing. • Sectors will increasingly engage in climate proofing (on voluntary basis), using the increasingly available methodologies, information and

	resources being provided across the institution.
Within 2-3 years	• Develop indicators to measure progress in climate proofing. • Preliminary learning and feedback to be assessed from experience with the process of climate proofing thus far.
After 3-5 years	• Measures taken to identify climate risk to **all** projects and physical investments. • If project is in "high-risk" category, adjustment of project is mandatory. • 95 percent of all projects in climate-sensitive sectors are climate proofed.

7 SUMMING UP

- Climate change is an important development issue with potential to adversely affect the financial viability of investments and intended benefit to recipients; many development agencies are giving serious consideration to this issue. The IDB is also willing, but current efforts are insufficient.
- Changes in climatic extremes as well as gradual changes in climatic averages need to be considered.
- Type I and Type II impact categories (similar to those specified in the DRM Safeguard) will need to be considered.
- A range of Policies and Safeguards exist that potentially could be used (in a voluntary or broadly applied sense) to address climate risk issues; alternatively, a new climate risk safeguard could be formulated **or** climate risk could be explicitly integrated into applicable existing safeguards/policies.
- Mandatory measures need to be complemented by parallel institution-wide efforts towards adaptation mainstreaming (including country and sector dialogues) **and** sectoral approaches (sectoral capacity needs to be built on evaluating climate risks, designing case studies, estimating incremental costs for climate proofing, etc).
- Capacity building and awareness-raising are needed at many levels.

- A phased approach over time towards achieving target levels of climate proofing of operations is likely to be constructive. Initial climate proofing is possible and recommended on a pilot basis.
- Supplemental funding (preferably grant) is likely to be needed for climate proofing and is possibly available.

Concluding Recommendations

- Close collaboration with other MDBs is strongly recommended, preferably through an informal group looking at compliance and climate risk management (possibly with a special subgroup looking at private sector issues). This will help in the development of a uniform approach to safeguards and compliance measures (and ensure a level playing field for all) and also enable sharing of methods and tools, including general approaches (including experiences from case studies) as well as data sources.
- The screening or climate proofing can be used partly to identify opportunities to mobilize additional grant financing to make the investment more robust can help to increase the interest of task managers and clients (a “carrot” compared to the stick of formal safeguard requirements). Initially, at least, funding should be made available to cover the additional screening costs during project feasibility studies and/or appraisal.
- It is best not to focus solely on deterministic risk management. Even for private sector investments, the main adjustments are not simply deterministic risk management, such as engineering changes based on specific quantitative trend information from climate data and/or projections. Instead, the approach taken should facilitate a more general risk management approach, also identifying ways to increase robustness of investments given potential trends and/or rising risks. This means focusing not only on structural but also non-structural adaptation options.

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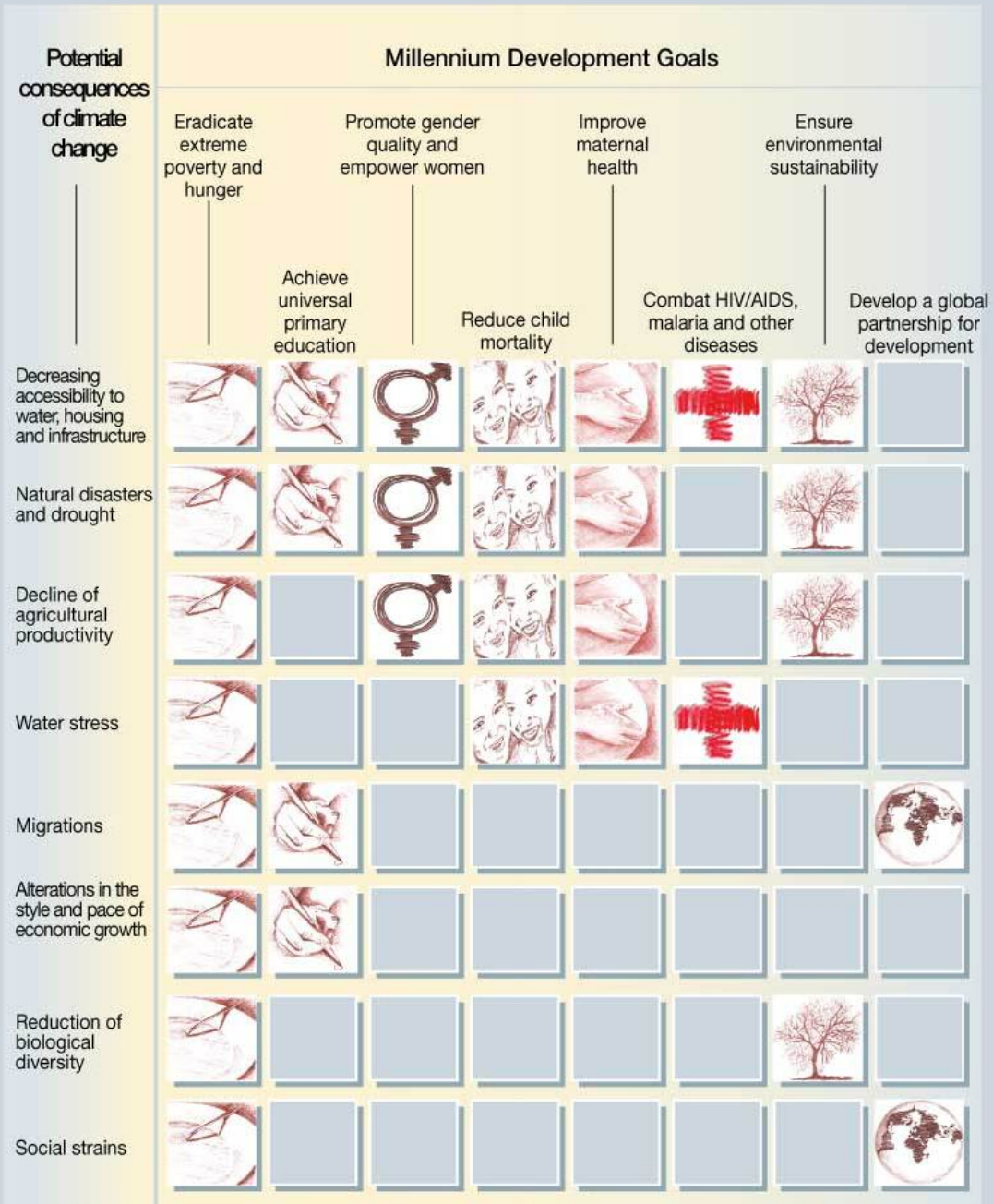
Climate change impacts that could affect attainment of the Millennium Development Goals



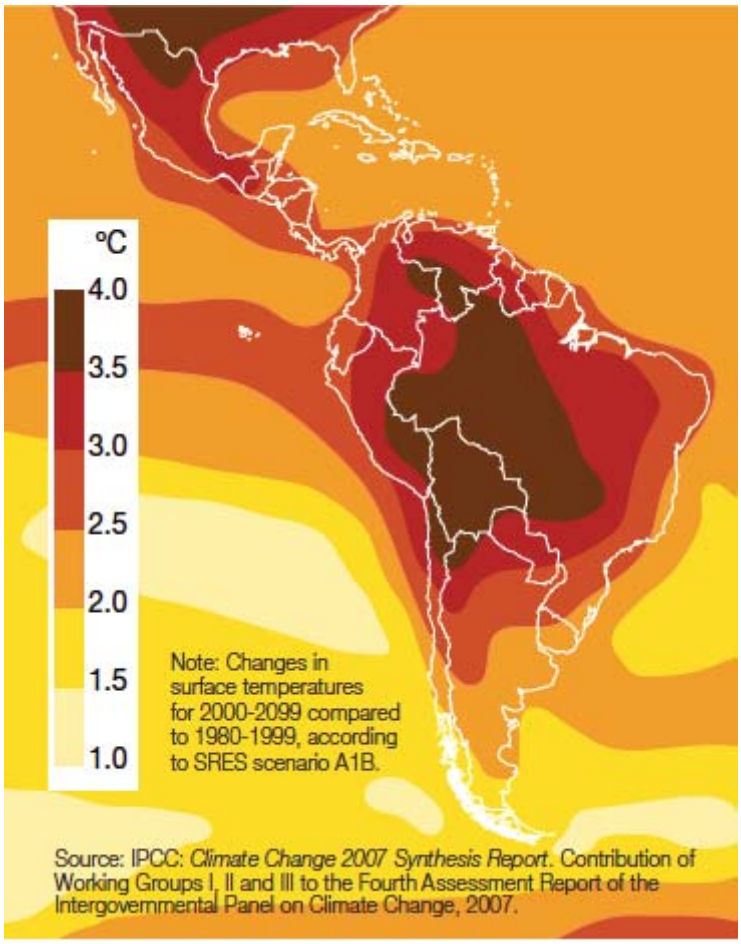
Note: Based on national communications from non-Annex I countries and the *Sixth Compilation and Synthesis of Initial National Communications from Parties Not Included in Annex 1 to the United Nations Framework Convention on Climate Change*.

Source: ECLAC, *Climate change and development in Latin America and the Caribbean. Overview 2009.*

In: UNEP/GRID-Arendal & ECLAC (2010)

Annex B

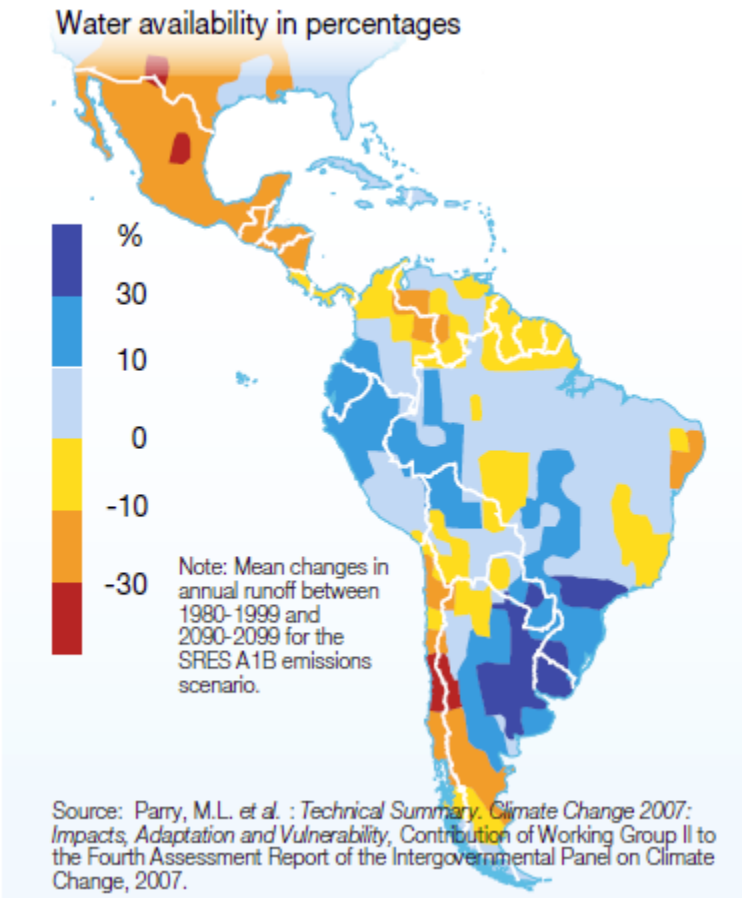
Warming of the Earth's Surface



Source: UNEP/GRID-Arendal & ECLAC (2010)

ANNEX C

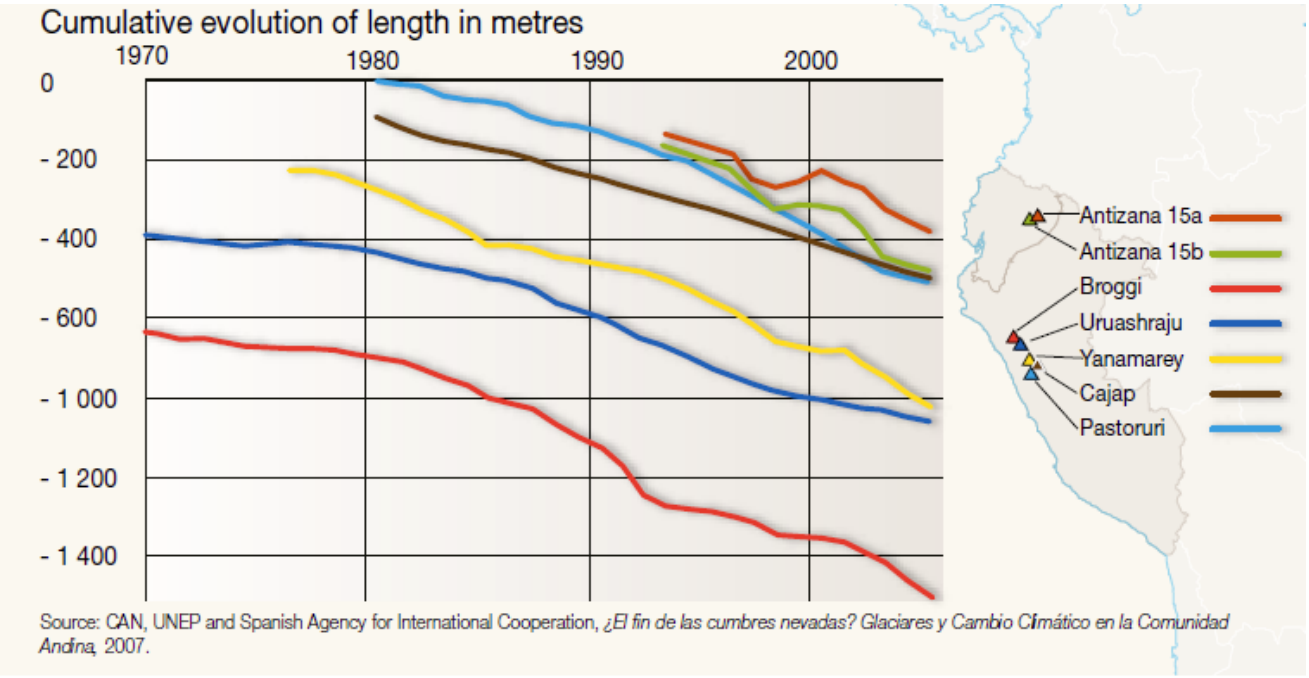
Mean Changes in Runoff



In: UNEP/GRID-Arendal & ECLAC (2010)

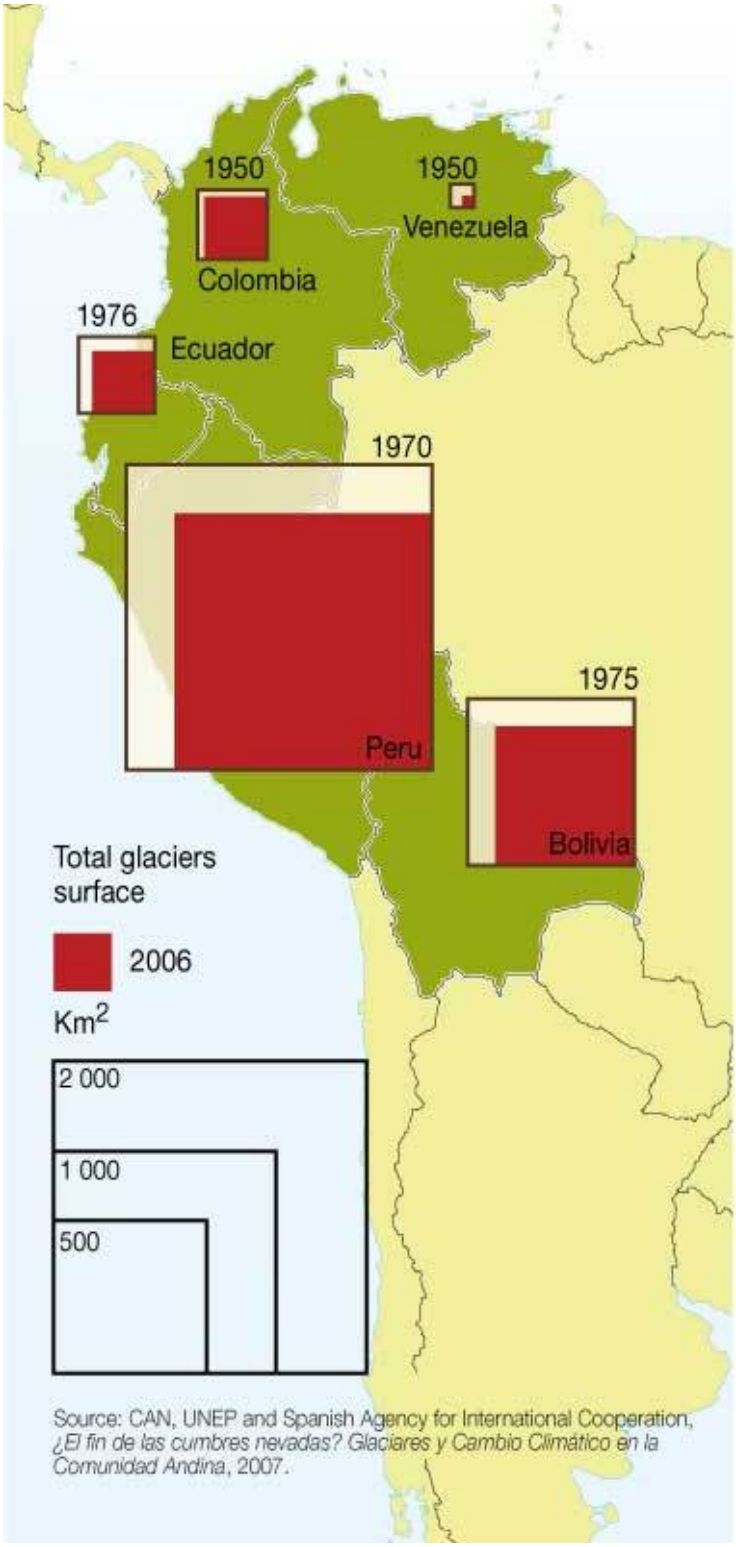
ANNEX D

(i) Retreat of Seven Andean Glaciers



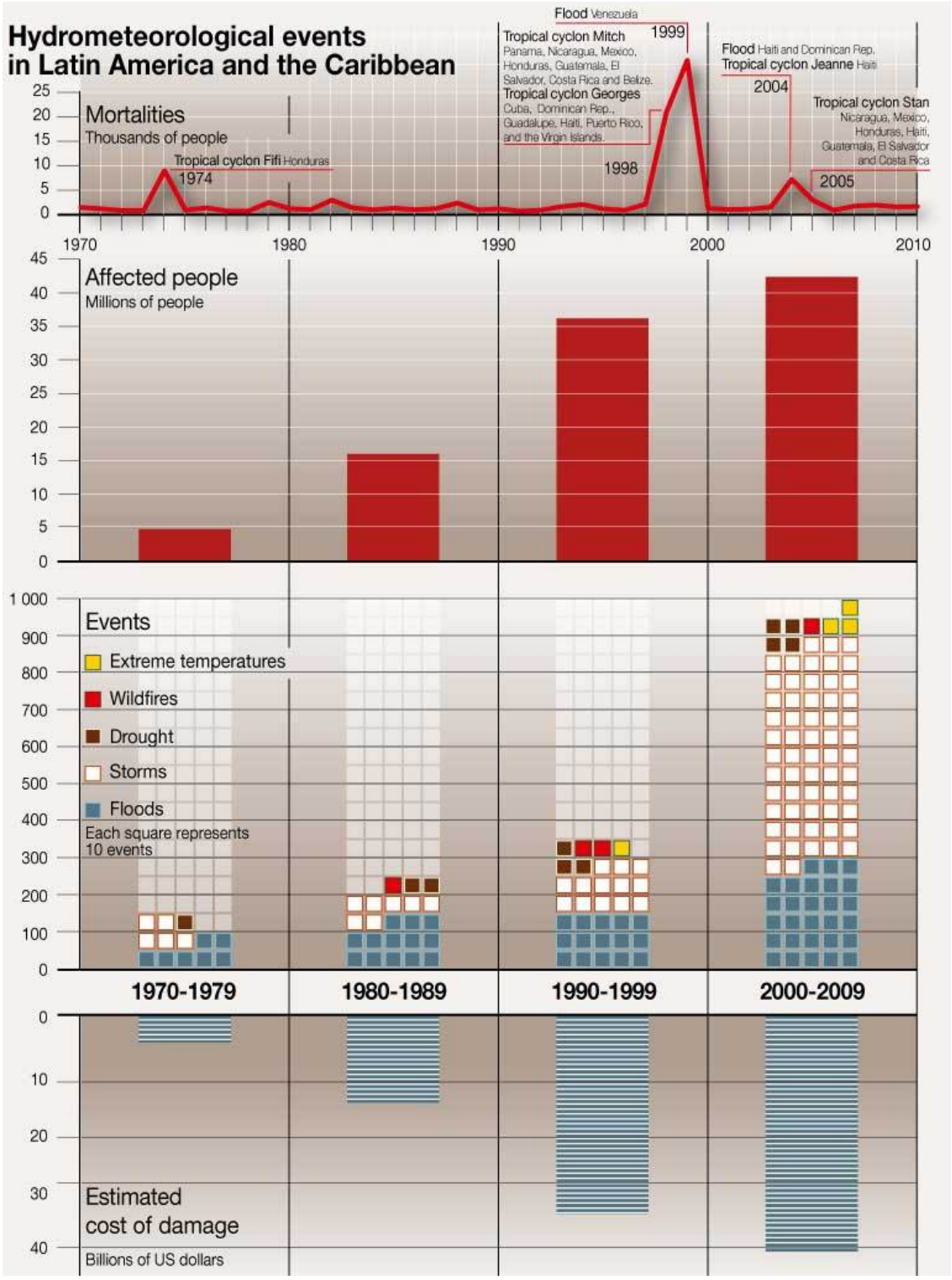
In: UNEP/GRID-Arendal & ECLAC (2010)

(ii) Retreat of Tropical Glaciers



In: UNEP/GRID-Arendal & ECLAC (2010)

ANNEX E



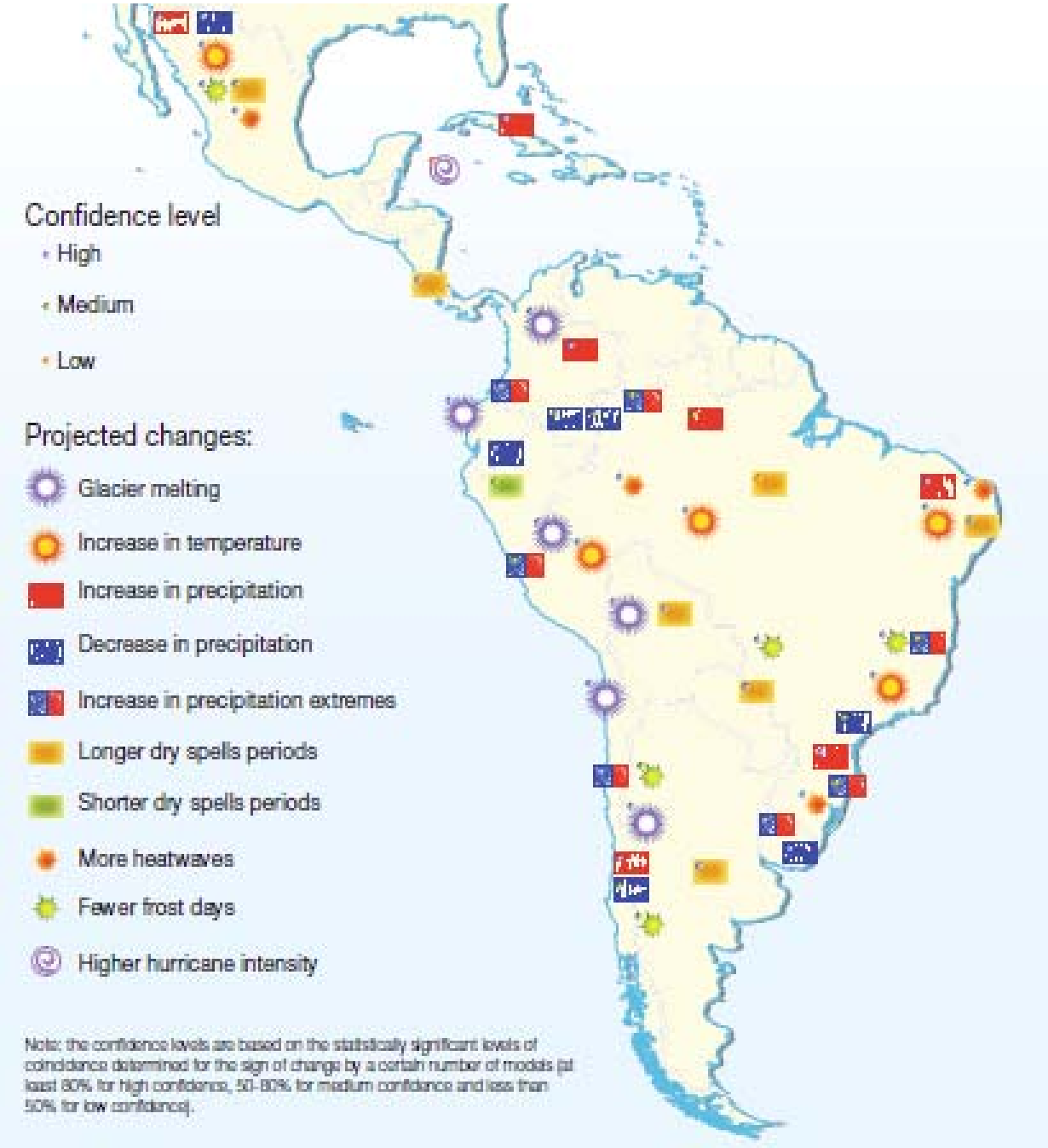
Source: International Disasters Database, accessed in August, 2010 in: UNEP/GRID-Arendal & ECLAC (2010)

ANNEX F

(i) Expected Impacts of Climate Change in 2050

Sources: R. Landa et al., Cambio climático y desarrollo sustentable, 2010; ECLAC, Climate Change. A regional perspective, 2010 in: UNEP/GRID-Arendal & ECLAC (2010)

(ii) Summary of Climate Change Patterns Projected for 2100 in Latin America and the Caribbean



Source: ECLAC, on the basis of information of the National Institute of Spatial Research (NPE) of Brazil, in:
UNEP/GRID-Arendal & ECLAC (2010)

ANNEX G

Example of an Adaptation Project

"Conservancy Adaptation Project, Guyana"

Guyana is highly vulnerable to sea level rises and changes in rainfall patterns. Heightened sea levels and more intense rain events increase the vulnerability of low-lying coastal countries to severe flooding. Drainage and irrigation systems that were constructed decades, or centuries ago were not designed to cope with these rapidly evolving threats. The proposed project therefore aims to serve as a template that could be applied to countries with similar geographical attributes in order to promote worldwide application of physical infrastructure upgrades that are necessary to mitigate the risk of catastrophic coastal flooding through the implementation of adaptation activities designed to reduce vulnerabilities.

The objective of the proposed Conservancy Adaptation Project is to help the Government of Guyana adapt to global climate changes by mitigating the country's vulnerability to flooding. The proposed project will help protect the coastal population currently vulnerable to annual flooding and at risk of losing their homes and means of economic production.

Components include analytical studies (system mapping, flow models) and interventions to dam and drainage structures to better cope with heavy rains and higher flows.

Source: Taken from documents available at: http://www.adaptationlearning.net/projects/guyana-conservancy-adaptation-project, accessed on December 31, 2010.

ANNEX H

Climate-related Factors Affecting Financial Performance and Conditions for Equity and Debt

- Market conditions, particularly supply and demand, can be a key determinant of future prices. Both supply and demand can be sensitive to climate factors. Future climate-driven changes in prices may, in turn, affect the competitiveness of investments.
- Efficiency, output, and performance of assets and equipment may decrease due to changing climate conditions, with consequences for revenue.
- Operating costs (OPEX) may increase due to changes in the price, availability, or quality of inputs. Maintenance costs may also increase.
- Insurance costs are likely to increase if climate-related claims continue to rise as projected. A more disquieting possibility, already a reality in some regions, is that insurance companies may completely abandon particular markets.
- Additional capital expenditure (CAPEX) may be required as a result of asset damage or decreased asset performance. Further, complying with environmental regulations may require additional CAPEX to upgrade facilities or equipment to cope with increased pollution risks.
- Staff health, safety, and productivity may be impacted by climate change, and this may lead to increased expenses.
- Loss contingency projections—reserves required to allow for potential disasters or other known risks—may need to increase as the risks of climate change become more likely and better quantified.
- Asset depreciation rates may increase. The rates currently used for accounting purposes generally reflect historical experience, but the effective depreciation rates of assets due to climate change may be considerably higher. Consequently, financial models may overestimate the real useful lives and value of physical assets. Faster capital depreciation could mean that assets need replacing more frequently, negatively affecting projected cash flows.
- Country risk may be aggravated by climate change impacts, particularly in economies where GDP is reliant on scarce water resources, or in smaller economies that are more vulnerable to catastrophic climate events. Significantly, studies show that rising temperatures in some regions are linked to increased risk of armed conflicts.

Source: IFC (2010a)

ANNEX I

Examples of Concerned Development Projects, Types of Impacts, and Certainty of Impacts

	Climate change impact category	
	Change in extreme events • Higher frequency of cat 4 + 5 hurricanes • **increased hydrologic extremes (rates and intensity),** Higher frequency of severe droughts	**Changes in long-term trends of climate variables (B)** • Sea level rise • Decreasing glacier • Change in precipitation (quantity and variability) • Change in temperature
	Increase in disasters (A) • Inundation • Landslide • Higher impact because of combination (A) under conditions of (B)	**Impact of Changes in long-term trends of climate variables (B)** • Loss of coastal land • **Salinization** of coastal land and water resources • Loss of water availability • Desertification • Loss/gain crop yields and • Changes in crop species • Invasive species • Ecosystem species redistribution • Insect infestation
Existing system	*Examples:* • Coastal protection because of sea level rise • Changing agricultural practices and crop species to withstand floods/droughts • Expand or modify disaster management because of changing patterns	*Examples :* • substituting water supply from glacier run off from Andean glaciers • Irrigation system which are resilient to changing precipitation patterns
Vulnerability Type 1: Planned Development project is exposed	*Examples:* • Destruction of tourism investments along coasts of Caribbean Islands with more high-intensity hurricanes. • Setbacks to slum upgrading as flooding happens due to increased rainfall intensity that is beyond the	*Examples:* • Dieback of vegetation planted for soil conservation projects due to temperature change. • Introduction of new crop pest species or disease as

	capacity of the installed storm drainage system. The flooding in slums provides conducive conditions for the spread of cholera, diarrhea, and provides breeding grounds for mosquitoes. • Drip irrigation systems are used in water-scarce areas. If prolonged droughts occur, however, these systems can get clogged and render this investment useless.	climatic trends change • Malaria control programs may need to be spatially expanded as mosquito populations enter in areas they formally did not exist due to more conducive climate. • Installation of sprinkler irrigation systems may not be cost-effective if temperature changes result in greatly increased evaporation. • Sea level rise can affect coastal investments, both directly and by resulting in bigger storm surges.
Vulnerability Type 2: Planned development project exacerbates threat for surrounding systems	*Examples:* • More intense rainfall can cause a road construction project on a hillside to create a landslide. • Heavier and more prolonged rains (than accounted for in analysis of current climate variability) can cause dam failures, with disastrous effects for downstream communities.	*Examples:* • Building an agricultural or forestry-related livelihoods base for communities that is based on species that the climate may not be suited for some years later. • [more examples to be added]

ANNEX J

(a) *Potential instances for addressing vulnerability in loan projects*

Project cycle phases	**In Sovereign Guarantee (SG) operations**	**In Non- Sovereign Guarantee (NSG) operations (private sector projects)**
Initial steps	• **Project idea** • if applicable (high impact projects) Safeguard Specialist assigned to Project Team	• **Project proposal** • if applicable (high impact projects) Safeguard Specialist assigned to Project Team
Project identification (Eligibility) phase **Results in project profile (PP)**	• Safeguard policy filter report • **Safeguard screening** for Project Classification report using Safeguards Toolkit • Review of ESG participation in Project team (if category A, high B, high B13) • **Draft Environmental Safeguard Strategy** (ESS) • Environmental and Social Review(ERS) of ESS • Request **Environmental Impact Assessment (EIA**) or Environmental Analysis (EA) from partner government • **project profile (PP)**	• Safeguard policy filter report • **Safeguard screening** for Project Classification report using Safeguards Toolkit • Review of ESG participation in Project team (if category A, high B, high B13) • **Draft Environmental Safeguard Strategy (ESS)** • Environmental and Social Review (ESR) of ESS) • Request **Environmental Impact Assessment (EIA)** or Environmental Analysis (EA) from sponsor • **project abstract (PA)**
	• Disclosure of PP including ESS and EIA to public	• Disclosure of PA or PA including ESS and EIA to public
Project preparation and analysis phase (NSG) or due diligence phase (SG)	• **TOR for ES expert**, (sometimes including climate proofing) if applicable • **ToR and selection of technical experts**	• **TOR for ES expert,** (sometimes including climate proofing) if applicable • **ToR and selection of technical experts**

	• Design of **Environmental and Social Management Report** (ESMR), if applicable (A, B and B13)	• Design of **Environmental and Social Management Report** (ESMR), if applicable (A, B and B13)
	• Analysis of o **economic, technical and financial** viability, o **environmental and social aspects,** ESMR (with consultants);	• Analysis of o **economic, technical and financial** viability, o **environmental and social aspects,** ESMR (with consultants);
Project approval stage	• Proposal for Loan Approval/Operational Development (PAL/POD) including 'Environmental & Social Aspects' section • ESR of Proposal for Operation Development POD Environmental and Social Review Process (part of QRR process)	• draft Loan or Guarantee Proposal (LGP) with related term sheet and ESMR or TFFP application • Design of E&S section of LGP • LGP E&S inputs
		• Client's review and authorization of release to public of Project Abstract and ESMR
	• Disclosure of POD ESMR	• Disclosure of PA and ESMR or E&S section in LPG
	• Approval of POD/ESMR	• Approval of LGP
		Design of E&S part in Term Sheet/Loan agreement
Project implementation	• Project Performance Monitoring Report (PPMR)	• Project Supervision Reports (PSR)

EXECUTION STAGE (SG) **PROJECT SUPERVISION (NSG) PHASE**	• Design of E&S parts of PPMR	• Design of E&S part in PSR • ESR of Monitoring reports (PSR..)
	• Loan Results Report (LRR) • VPS/ESG Chief signs off on LRR's progress report of safeguard measures and results of safeguard compliance.	
	• Project Completion Report (PCR) • Follow up of E&S issues when necessary	
M&E	Environmental and Social Project Monitoring Plan	
	Environmental and Social Monitoring Consultants	
	Semi-Annual Review	
	Environmental, Social, Health and Safety Audits	

(b) *Options to address climate change vulnerability and proofing in the project cycle (in case of Sovereign Guarantee – SG - Loan)*

Project identification	ESG Safeguards Toolkit	Does not currently enable project staff to identify (future) climate risk	• Identification of Disaster Risk screening includes consideration of increased frequency or intensity of climatic hazards at location. • Changes in long-term climatic trends may affect project sustainability and intended impact of project, and pose financial risk.
	Eligibility Review Meeting	Can be used	Through discussion on OP-704 and Policy Directives A.3, A.6, and B.4.
Project appraisal	Proposal for Loan Approval/Operational Development (PAL/POD) – 'Environmental & Social Aspects' section	Opportunity to address whether climate risks are identified and how they will be addressed	'Environmental and Social Aspects' section to include assessment of potential climate risks to the project (or exacerbated by the project).
	Environmental and Social Review Process (part of QRR process)	Yes; can potentially be used	
	Environment and Social Management Report (ESMR)		Includes evaluation of environmental and social risks, including "other risk factors" (Policy Directive B.4)

	Analysis by ESG Specialist if needed	Yes	
Project design	TORs for consultant procurement	Not as presently defined	Guidelines for environmental engineers and other consultants working on climate-sensitive projects to be broadened to include analysis of climate risk and options for re-design, if needed.
Project implementation	Project Performance Monitoring Report		
	Loan Results Report		
	Project Completion Report		
M&E	Environmental and Social Project Monitoring Plan		
	Environmental and Social Monitoring Consultants		
	Semi-Annual Review		
	Project Completion Reports		Depends on how the Loan Agreement was phrased, and which risks were identified at the time.
	Environmental, Social, Health and Safety Audits		

(c) *Options to Address Climate Change Vulnerability and Proofing in the Project Cycle (in case of Non Sovereign Guarantee – NSG - Loan)*

Existing instruments that can be applied / **Steps in the project cycle**	**Existing Safeguard Procedures and Documents**	**Narrow interpretation with respect to climate change**	**Entry points for modifications, or additions required for addressing CCV and CP,** **Broad approach**
Project identification	ESG Safeguards Toolkit		• Broaden Disaster Risk screening to include consideration of increased frequency or intensity of climatic hazards at location. • Ask project staff if they have considered potential impacts of changes in long-term climatic trends to project sustainability and impact of project.
	Eligibility Review Meeting		Include consideration of climate risk as discussion item.
	Environmental and Social Safeguard Strategy		Requires identification of whether project involves international issues (e.g., or international environmental treaties or conventions).
	Environmental and Social Due Diligence (ESDD) Report		The ESDD evaluates the adequacy of proposed environmental, health and social assessments and procedures to ensure all project-related impacts and risks are adequately

			mitigated. It can thus be applied to include climate risk assessment.
Project appraisal	Proposal for Loan Approval/Operational Development (PAL/POD) – 'Environmental & Social Aspects' section		
	Environmental and Social Review Process (part of QRR process)		
	Environment and Social Management Report (ESMR)		
	Analysis by ESG Specialist if needed		
Project design	TORs for consultant procurement		
Project implementation	Project Performance Monitoring Report		
	Loan Results Report		
	Project Completion report		
M&E	Environmental and Social Project monitoring Plan		
	Environmental and Social Monitoring Consultants		

	Semi-Annual Review		
	Project Completion Reports		
	Environmental, Health and Safety Audits		