TECHNICAL ANNEX[1]

CONTINGENT LOAN FOR NATURAL DISASTER EMERGENCIES

(BH-O0003)

CONTRIBUTION TO CLIMATE CHANGE ADAPTATION

I. CLIMATE CHANGE, EXTREME EVENTS AND NATURAL DISASTERS

1.1 Global temperatures have been increasing significantly since the turn of the 20th century (e.g., land and ocean surface temperatures). The International Panel on Climate Change (IPCC), in its Synthesis Report, concluded that warming of the global climate system is unequivocal, and human influence, through the emissions of greenhouse gas (GHG), has been the dominant cause (IPCC, 2014b).[2] Although sizable fluctuations happen over long periods, the speed at which the climate has changed since the 1950s seems unprecedented in the past 10,000 years (Marcott et al., 2013; Hansen and Sato, 2012). There is strong evidence that these changes have caused impacts on both natural and human systems (IPCC, 2014a). In many regions, for instance, quantity and quality of water resources have been affected by changing precipitation or melting snow (Baraer et al., 2012; Min et al., 2011); global agricultural production has been negatively impacted (Lobell et al., 2011); and the frequency and intensity of extreme weather and climate events have risen since the 1950s (IPCC, 2012). Global temperatures are projected to rise further over the 21st century under all realistic emission scenarios, posing greater risks to natural systems and vulnerable groups (IPCC, 2012, 2013, 2014a).

1.2 **Climate Change and Natural Disasters.** The IPCC has warned that the influence of climate change on the frequency, intensity and duration of extreme weather events, in interaction with exposed and vulnerable human and natural systems, can result in disasters (IPCC, 2012, 2014a). In a special report (SREX), the IPCC has provided a framework to understand the interaction between climate change, extreme weather events and natural disasters, which is synthetized in Figure 1 (IPCC, 2012). As shown, extreme weather events or natural hazards are influenced by a wide range of factors, including human-induced climate change and natural variability; however, they do not by themselves represent disasters. A disaster is the result of the severity of the natural hazard combined with the preexisting exposure and vulnerability, and the inability of the population and institutions to resist, absorb, adapt to, and recover from the impacts of the hazard (UNISDR, 2009). As large urban agglomerations continue to grow,[3] economic activity will become spatially more concentrated within countries, and thus changes in climate will amplify existing disaster risks and create new ones. To reduce and manage those risks, the IPCC has called for strategies that integrate climate

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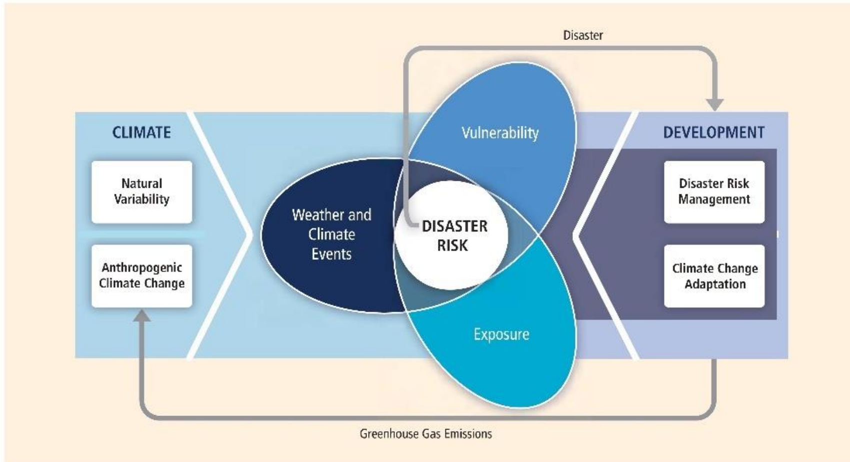
[1] This document was authored by Hongrui Zhang, under the supervision of Juan Jose Durante from the Connectivity, Markets and Finance Division (IFD/CMF); with the collaboration of Maricarmen Esquivel from the Climate Change Division (CSD/CCS).

[2] "Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, and in global mean sea level rise; and it is extremely likely to have been the dominant cause of the observed warming since the mid-20th century", IPCC, 2014. Page 47.

[3] According to the United Nations' latest report on urbanization prospects, 68% of the world's population is projected to live in urban areas by 2050, up from 30% in 1950. See World Urban Prospects: The 2018 Revision, United Nations, 2018.

change adaptation and disaster risk management (DRM), including those aimed to reduce and transfer risks of natural disasters.

Figure 1: Climate change and natural disasters



Source: IPCC (2012)

1.3 **Past and Current Trends.** While there are uncertainties in the overall trends at the global scale, observations gathered by the scientific community since the 1950s show a change in the frequency, intensity, and duration of some extreme weather and climate events, along with a warmer global climate system (IPCC, 2012). Many regions in North America and Europe, for instance, have seen a statistically significant increase in the number of daily extreme or heavy precipitation events, while others in Africa have experienced more intense and longer droughts.[4] As well, an assessment report by the US Climate Change Science Program (CCSP) founded that the occurrence of tropical storms and major hurricanes in the North Atlantic has increased over the past 100 years, a period in which sea surface temperatures also increased (Kunkel et al., 2008). Likewise, evidence drawn from historical trends indicates that tropical cyclones have become more frequent and intense in the Atlantic basin, leaving coastal areas and small islands in the Caribbean particularly exposed to such hazards. An analysis of 150 years of hurricane data collected by the National Hurricane Center (NHC)[5] shows that the number of hurricanes averaged 7 per year in the Atlantic basin during 2000 and 2016, up from a historical average of 5.

1.4 This overall trend in the number of hazardous events over the last few decades has also been noted by insurance companies and international disaster databases. A report published by Swiss Re (2018) found that the number of natural disasters[6] has increased more than fourfold since 1970. Likewise, the events recorded by Munich Re (2018) show a clear long-term trend: the number of relevant loss disasters has more than double since 1980. Similar findings are noted in the Emergency Events Database (EM-DAT). Figure 3 shows that the number of climate-related disasters has increased substantially since 1980, despite the interannual variability. This upward trend could,

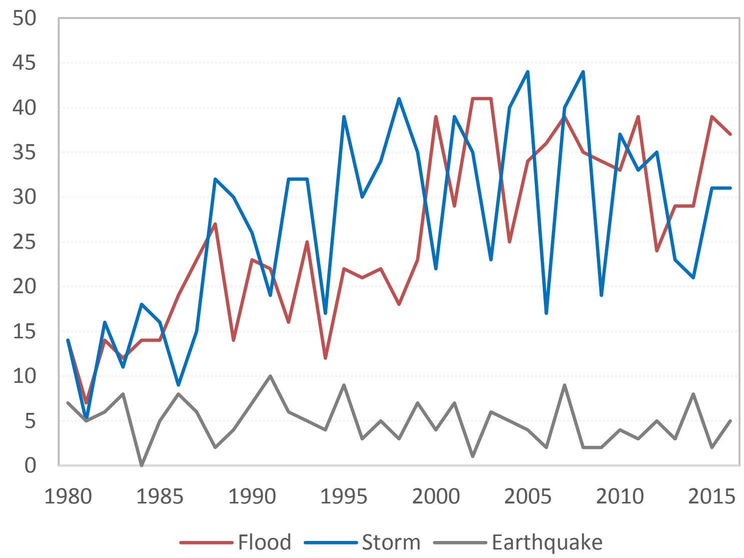
[4] Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, Table 3-2, IPCC

[5] The Atlantic revised hurricane database (HURDAT2) is maintained by the NHC, which conducts a post-storm analysis of each tropical cyclone to determine the official assessment of the cyclone's history.

[6] Swiss Re classifies an event as a catastrophe when insured claims, total losses or the number of casualties exceed certain thresholds. See "Natural catastrophes and man-made disasters in 2017: a year of record-breaking losses", Swiss Re, *sigma* No. 1/2018.

of course, be driven by better reporting of harmful events and increased exposure and vulnerability, yet reported earthquakes have remained stable since the 1970, while the number of weather-related events has continued to rise (Peduzzi, 2005; Banholzer et al., 2014), which suggests that another major force (climate change) is affecting the frequency of natural hazards.

Figure 2: Number of reported disasters in Americas (1980-2016)



Source: EM-DAT

1.5 **Disaster Losses.** According to the SREX report, global economic losses and fatality rates from weather-and climate-related disasters have increased considerably over the last few decades. Between the 1960s and the 1990s, material damage from large weather events increased eightfold, while insured damage climbed by 17-fold in the same period. Insurance and reinsurance companies as well have estimated that insured and uninsured losses and volatility have been rising (Swiss Re, 2018; Munich Re, 2018). The losses, measured as percentage of gross domestic product (GDP), are higher in developing countries and small island developing states,[7] indicating a higher vulnerability of their assets and population (Cavallo and Noy, 2009). While most studies find that increasing exposure of population and assets[8] have been the main cause of these upward trends in economic losses, they have not ruled out climate change as a contributing factor. Furthermore, projected changes in climate, including its influence on the frequency and intensity of extreme weather hazards, will likely lead to higher economic losses as the world's urban population continues to expand.

1.6 **Future Trends.** The IPCC acknowledges that the projected risks and impacts caused by changes in climate are subject to some degree of uncertainty. Specifically, confidence on projections of future extreme weather and climate events depends on

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[7] According to the IPCC (2012), over 95% of fatalities from natural disasters happened in developing countries from 1970 to 2008; while losses in small exposed countries have been especially high, averaging above 1% of GDP per year from 1970 to 2010. In high-income countries the losses have been less than 0.1% of GDP.

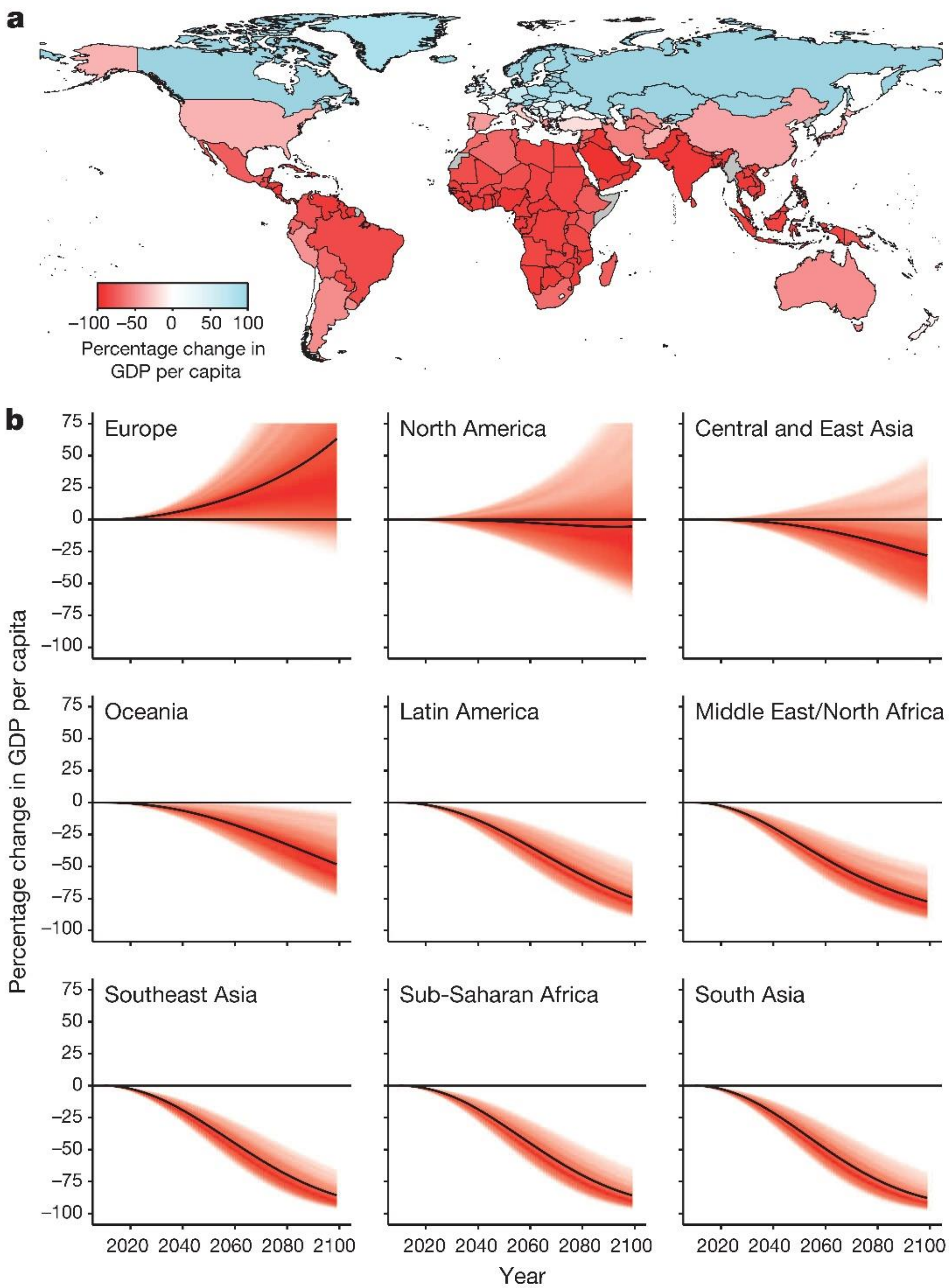
[8] The wide range of interacting factors explains the increase in exposure and vulnerability of population and assets. For example, rapid urbanization, the lack of land use planning, and poor management of key ecosystems.

a variety of factors, including: (i) uncertainties related to climate model parameters and structure (e.g., the capacity of models to simulate events), (ii) the quality of the observational data, (iii) the choice of emission scenarios, (iv) the natural variability of climate, (v) the type of extreme events, and the temporal and spatial scale of events (IPCC, 2012; Banholzer et al., 2014; NASEM, 2016). That said, there is confidence on the overall future trends of some types of events. For instance, it is likely that the frequency of heavy precipitation events will rise in the 21st century in many areas of the globe (e.g., Southeastern South America and western Amazonia), leading to greater risks of flooding in some regions (Marengo et al., 2009). Sea levels are expected to rise further in more than 95% of the ocean area and will continue affecting locations that currently face coastal erosions and floods. Tropical cyclones and their associated rainfalls will likely become more intense in the Atlantic under greenhouse warming by the end of the 21st century, and pose serious threats to the sustainability of tropical small island states.[9] Droughts too are projected to increase in duration and intensity in some regions as the global mean surface continues to warm. The affected regions include Mexico, Central America and northeast Brazil.

1.7 **Likely Economic Impacts**. Though the future economic consequences of changes in climate are difficult to pin down, because of the inherent uncertainties in most long-term projections, it is more likely than not that the impacts will be significant, especially in developing countries (Figure 3). Rising temperatures and the associated effects can reduce per capital output in most low-income countries through several channels: suboptimal agricultural output, low labor productivity in sectors exposed and vulnerable to extreme events, and reduced capital accumulation. According to a report by the International Monetary Fund (IMF), under the scenario of unmitigated climate change, a typical low-income country would see its per capita output reduced by 9% in 2100 relative to no climate change. Other projections are even more alarming. Burke et al. (2015) predict a drop of 23% in the global output in 2100 relative to a world without climate change, though the projected effects vary across regions due to the nonlinearity of economic productivity in temperature for all countries. For instance, countries with relatively cooler-than-average temperatures (e.g., European countries) could benefit from global warming; whereas locations with high average temperatures (e.g., poor regions) could be affected.

[9] Studies reviewed by the IPCC (2012) find that the mean maximum wind speed will probably rise between 2% to 11% globally.

Figure 3: Projected economic impact of rising temperatures

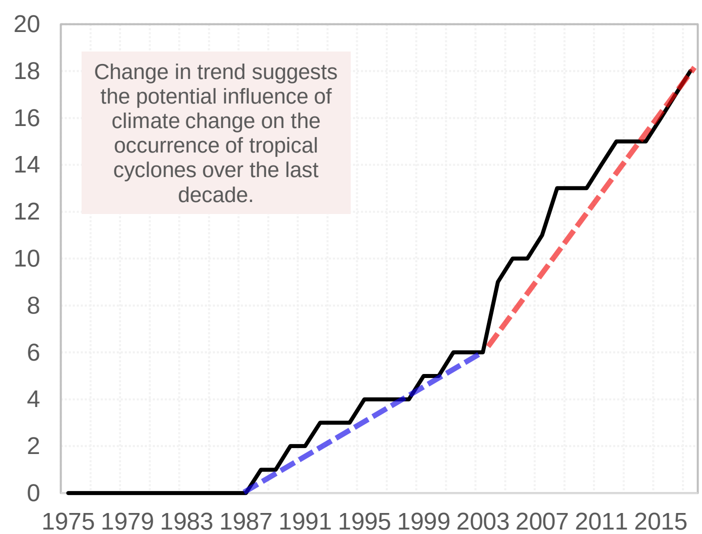


Source: Burke et al. (2015)

II. VULNERABILITY OF THE BAHAMAS TO CLIMATE CHANGE

2.1 **Vulnerability to Natural Hazards.** The Commonwealth of The Bahamas is highly exposed and vulnerable to natural hazards. According to the Coastal Risk Index, a metric of the exposure and vulnerability of coastal nations to hazards such as floods, tsunamis and sea level rise, The Bahamas stands 13th out of the top 20 coastal nations at risk[10]. Similarly, the Germanwatch Global Climate Risk Index 2018[11], a measure of level of exposure and vulnerability to weather-related events such as storms and floods, The Bahamas stands 17th out of 182 in the ranking of most affected countries in the period 1997-2016. The most severe hazards experienced are hurricanes. In the past 50 years, The Bahamas has endured 18 tropical cyclones, with increased occurrence and meaningful damage and losses over the last decade (Figure 1). Changes in climate is likely influencing this observed increase in the frequency of intense hurricanes (Christensen et al., 2013). In the last three years alone, three hurricanes of Category 3 or higher made passage through the country: (i) Hurricane Joaquin in 2015, which affected the southeastern islands that have a small concentration of population, and caused damage and losses of US$114 million[12]; (ii) Hurricane Matthew in 2016, which greatly affected major population centers in New Providence and Grand Bahama, as well as the district of North Andros, and caused damage and losses of US$519 million[13]; and (iii) Hurricane Irma in 2017, with an estimated total damage and losses of US$118 million (about 1.3% of GDP)[14].

Figure 4: Cumulative occurrence of tropical cyclones in The Bahamas, 1975-2017



Source: EM-DAT

[10] CARIBSAVE Climate Change Risk Profile for The Bahamas. CARIBSAVE, 2012.

[11] Global Climate Risk Index 2018. Eckstein et al., November 2017. The index uses four indicators as inputs: (i) number of deaths, (ii) number of deaths per 100,000 inhabitants, (iii) sum of losses in US$ in purchasing power parity (PPP), and (iv) economic losses as percentage of gross domestic product (GDP). Each country's index score is a weighted average of these four indicators, with the following weight distribution: 1/6, 1/3, 1/6, and 1/3, respectively.

[12] Assessment of the Effects and Impacts Caused by Hurricane Joaquin. The Bahamas. IDB, ECLAC (2016).

[13] Assessment of the Effects and Impacts Caused by Hurricane Matthew. The Bahamas. IDB, ECLAC (2017).

[14] Assessment of the Effects and Impacts Caused by Hurricane Irma. The Bahamas. IDB, ECLAC (2017).

2.2 **Climate Change Risks.** Disaster risk in the country is considered high due mainly to socio-economic factors, such as the location of communities and infrastructure, mostly in coastal areas. These trends are likely to worsen without stronger land use and coastal planning and permitting enforcement, and as a result of climate change. With most of its territory a few meters above mean sea level, The Bahamas is highly vulnerable to sea level rise and storm surge associated with increasing intensity of extreme weather events due to the impacts of climate change.[15] Likely impacts include coastal flooding and erosion, mangrove retreat, decreased seagrass bed productivity, and saltwater intrusion into existing small lenses of fresh groundwater.[16] A IDB study indicates that the probable flood exposed area in Nassau will expand 8% by 2050 due to the increasing precipitation caused by climate change.[17]

2.3 The Bahamian economy is heavily dependent on natural resources for its tourism, fisheries, and other sources of revenue. The potential impacts of natural hazards and climate change on the natural resource base that supports tourism are a serious concern for future environmental, economic, and social sustainability in The Bahamas.[18] In 2016, Hurricane Matthew caused losses equivalent to 6.75% of GDP, with a resultant significant impact on tourism during 2016 and early 2017. A study ECLAC (2011) on the consequences of climate change for the Caribbean economies predicts that, under the high-emissions scenarios, tourist arrivals in The Bahamas are likely to decline by an average of 9.5% over the next three decades.

III. CLIMATE FINANCE AND DISASTER RISK FINANCING

3.1 **Mitigation and Adaptation.** The IPCC (2014b) sees mitigation and adaptation as two complementary strategies to combat climate change. Mitigation refers to the actions to reduce greenhouse gas so as to limit climate change; while adaptation is the adjustment process to the current and expected effects of climate change, including these related to extreme climate and weather events, in order to mitigate or avoid the impacts. The focus of this note is on climate change adaptation as the proposed operation seeks to increase the resilience of the country to climate and disaster risks (i.e., tropical cyclones) through improved financial risk management and the satisfactory execution of the Comprehensive Natural Disaster Risk Management Program (CDRMP).

3.2 **Adaptation Finance.** Based on the distinction between mitigation and adaptation, the multilateral development banks (MDBs),[19] the International Development Finance Club, and the OECD Development Assistance Committee (DAC) have

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15 The Bahamas: Intended Nationally Determined Contributions (INDC) under the United Nations Framework Convention on Climate Change (UNFCCC).

16 Murray Simpson et al., "CARIBSAVE Climate Change Risk Atlas - The Bahamas." (Barbados: DFID, AusAID and CARIBSAVE, 2012).

17 Environmental Resources Management. "Consulting Engagement 2 Hazards and Risks: Sustainable Nassau Action Plan" IDB, 2016.

18 Vision 2040: National Development Plan (NDP) of The Bahamas.

19 The MDBs comprises the African Development Bank (AfDB), the Asia Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the Inter-American Development Bank Group (IDBG), and the World Bank Group (WBG).

agreed and harmonized the principles and methodologies for tracking mitigation and adaptation finance, ensuring that they are aligned with the Paris Agreement. Specifically, the joint methodology for tracking projects that contribute to climate change adaptation consists of three steps: (i) setting out the climate change vulnerability context; (ii) making an explicit statement of purpose to address climate vulnerability; and (iii) articulating a clear and direct link between vulnerability and project activities.[20]

3.3 **Adaptation and Disaster Risks Management.** The IPCC has called for reducing and managing disaster risks through approaches that integrate climate change adaptation and DRM. Thus, **DRM actions aimed at mitigating the potential adverse impacts of extreme weather and climate events should be regarded as adaptation measures[21]**. But as risks cannot fully be eliminated, an effective and comprehensive DRM approach, that integrates the influence of climate change on natural hazards, should include not only actions to reduce exposure and vulnerability, but must also have in place an integrated risk financing strategy that strengthens resilience and eases the financial and socioeconomic impacts of natural disasters (Andersen et al., 2010; OECD, 2017). Furthermore, to advance climate adaptation, the IPCC (2012) has recommended governments to strike the right balance between reducing risks from extreme events, transferring them, and managing the residual (e.g., through risk financing instruments). The UNFCCC (2015) as well has highlighted the role of risk financing instruments for addressing climate change impacts.

3.4 To appreciate the role of risk financing instruments in advancing climate adaptation more clearly, it is helpful to take a view of DRM that distinguishes the different layers of disaster risks[22]. In other words, recognizing that frequent and low-impact events and rare and catastrophic events require different DRM responses (Figure 5). Of course, whenever possible, risk-reducing actions that are economic and socially efficient should be prioritized. For example, adopting better building codes could raise the cost of infrastructure projects, but it might be a cost-effective option. Though risk-reducing actions might be cost-effective for addressing low-layer risks (e.g., sea level rise), they are probably too costly for medium-to-high layers. Instead, modern financing instruments that retain, share or transfer risks such as contingent credit and insurance may be more cost-effective to mitigate the impacts of extreme climate-induced events. This view shows the complementary role of disaster risk reduction and financing, and their contribution to climate change adaptation. The IDB's contingent loans for natural disaster emergencies are designed upon a risk-layer DRM framework that stresses the importance of providing efficient responses to the different layers of disaster risks (GN-2502-2).

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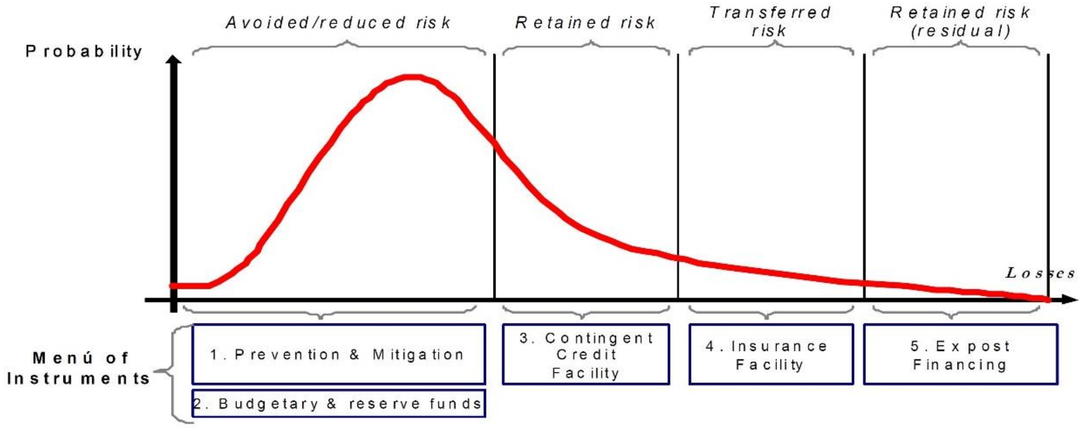
[20] See Annex B of the 2016 Joint Report on Multilateral Development Banks' Climate Finance.

[21] The best practice is to contemplate the influence (current and projected) of climate change in the design of DRM strategies and actions. For example, climate change projections should be included when conducting a DRM assessment in the Caribbean.

[22] This DRM approach is recognized by the academic community and development institutions. See Linnerooth-Bayer and Hochrainer-Stigler (2014) and Cummins and Mahul (2008).

Figure 5: Disaster risk layers and DRM instruments



Source: IDB (2009)

3.5 **Disaster Risk financing instruments can contribute to climate change adaptation** if they are designed not only to redistribute risks, but also help reduce losses and damage, provide strong incentives for preventive behavior to reduce risks and avoid moral hazards, increase resilience, and serve as safety nets for the poor and vulnerable households (Linnerooth-Bayer and Hochrainer-Stigler, 2014). A good example are the contingent loans for natural disasters that the IDB provides to the governments. They provide rapid and cost-efficient funds to governments to finance unforeseen public expenditures during natural disaster emergencies, which helps reduce human and material losses and lays the foundation for reconstruction and recovery of economic activity.[23] Because the frequency and severity of extreme events are expected to increase due to climate change, the availability of funds to help the population and economy to recover faster is in itself a resilience or adaptation measure, a view that is consistent with the IPCC's recommendations (Figure 6). Furthermore, the IDB's contingent loans are more than a financing instrument, as they also provide strong incentives to reduce risks and improve DRM (through the CDRMP).[24]

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[23] See Andersen et al. (2010), and Laframboise and Loko (2012).

[24] The Comprehensive Natural Disaster Risk Management Program (CDRMP) is a DRM program agreed upon by the country and the Bank for the purpose of this operation. It includes the following lines of action or key areas: (i) disaster risk management governance; (ii) risk identification; (iii) risk reduction; (iv) preparation for emergency and response; and (v) financial protection and risk transfer. The CDRMP includes a matrix with the activities necessary for the country to achieve progress in these five key areas of DRM, which are monitored through indicators established annually.

Figure 6: Approaches for managing the risks of climate change

Overlapping Approaches	Category	Examples	Chapter Reference(s)
Vulnerability & Exposure Reduction through development, planning, & practices including many low-regrets measures	Human development	Improved access to education, nutrition, health facilities, energy, safe housing & settlement structures, & social support structures; Reduced gender inequality & marginalization in other forms.	8.3, 9.3, 13.1-3, 14.2-3, 22.4
	Poverty alleviation	Improved access to & control of local resources; Land tenure; Disaster risk reduction; Social safety nets & social protection; Insurance schemes.	8.3-4, 9.3, 13.1-3
	Livelihood security	Income, asset, & livelihood diversification; Improved infrastructure; Access to technology & decision-making fora; Increased decision-making power; Changed cropping, livestock, & aquaculture practices; Reliance on social networks.	7.5, 9.4, 13.1-3, 22.3-4, 23.4, 26.5, 27.3, 29.6, Table SM24-7
	Disaster risk management	Early warning systems; Hazard & vulnerability mapping; Diversifying water resources; Improved drainage; Flood & cyclone shelters; Building codes & practices; Storm & wastewater management; Transport & road infrastructure improvements.	8.2-4, 11.7, 14.3, 15.4, 22.4, 24.4, 26.6, 28.4, Box 25-1, Table 3-3
	Ecosystem management	Maintaining wetlands & urban green spaces; Coastal afforestation; Watershed & reservoir management; Reduction of other stressors on ecosystems & of habitat fragmentation; Maintenance of genetic diversity; Manipulation of disturbance regimes; Community-based natural resource management.	4.3-4, 8.3, 22.4, Table 3-3, Boxes 4-3, 8-2, 15-1, 25-8, 25-9, & CC-EA
	Spatial or land-use planning	Provisioning of adequate housing, infrastructure, & services; Managing development in flood prone & other high risk areas; Urban planning & upgrading programs; Land zoning laws; Easements; Protected areas.	4.4, 8.1-4, 22.4, 23.7-8, 27.3, Box 25-8
Adaptation including incremental & transformational adjustments	Structural/physical	***Engineered & built-environment options***: Sea walls & coastal protection structures; Flood levees; Water storage; Improved drainage; Flood & cyclone shelters; Building codes & practices; Storm & wastewater management; Transport & road infrastructure improvements; Floating houses; Power plant & electricity grid adjustments.	3.5-6, 5.5, 8.2-3, 10.2, 11.7, 23.3, 24.4, 25.7, 26.3, 26.8, Boxes 15-1, 25-1, 25-2, & 25-8
		Technological options: New crop & animal varieties; Indigenous, traditional, & local knowledge, technologies, & methods; Efficient irrigation; Water-saving technologies; Desalinization; Conservation agriculture; Food storage & preservation facilities; Hazard & vulnerability mapping & monitoring; Early warning systems; Building insulation; Mechanical & passive cooling; Technology development, transfer, & diffusion.	7.5, 8.3, 9.4, 10.3, 15.4, 22.4, 24.4, 26.3, 26.5, 27.3, 28.2, 28.4, 29.6-7, Boxes 20-5 & 25-2, Tables 3-3 & 15-1
		Ecosystem-based options: Ecological restoration; Soil conservation; Afforestation & reforestation; Mangrove conservation & replanting; Green infrastructure (e.g., shade trees, green roofs); Controlling overfishing; Fisheries co-management; Assisted species migration & dispersal; Ecological corridors; Seed banks, gene banks, & other *ex situ* conservation; Community-based natural resource management.	4.4, 5.5, 6.4, 8.3, 9.4, 11.7, 15.4, 22.4, 23.6-7, 24.4, 25.6, 27.3, 28.2, 29.7, 30.6, Boxes 15-1, 22-2, 25-9, 26-2, & CC-EA
		Services: Social safety nets & social protection; Food banks & distribution of food surplus; Municipal services including water & sanitation; Vaccination programs; Essential public health services; Enhanced emergency medical services.	3.5-6, 8.3, 9.3, 11.7, 11.9, 22.4, 29.6, Box 13-2
	Institutional	***Economic options***: Financial incentives; Insurance; Catastrophe bonds; Payments for ecosystem services; Pricing water to encourage universal provision and careful use; Microfinance; Disaster contingency funds; Cash transfers; Public-private partnerships.	8.3-4, 9.4, 10.7, 11.7, 13.3, 15.4, 17.5, 22.4, 26.7, 27.6, 29.6, Box 25-7
		Laws & regulations: Land zoning laws; Building standards & practices; Easements; Water regulations & agreements; Laws to support disaster risk reduction; Laws to encourage insurance purchasing; Defined property rights & land tenure security; Protected areas; Fishing quotas; Patent pools & technology transfer.	4.4, 8.3, 9.3, 10.5, 10.7, 15.2, 15.4, 17.5, 22.4, 23.4, 23.7, 24.4, 25.4, 26.3, 27.3, 30.6, Table 25-2, Box CC-CR
		National & government policies & programs: National & regional adaptation plans including mainstreaming; Sub-national & local adaptation plans; Economic diversification; Urban upgrading programs; Municipal water management programs; Disaster planning & preparedness; Integrated water resource management; Integrated coastal zone management; Ecosystem-based management; Community-based adaptation.	2.4, 3.6, 4.4, 5.5, 6.4, 7.5, 8.3, 11.7, 15.2-5, 22.4, 23.7, 25.4, 25.8, 26.8-9, 27.3-4, 29.6, Boxes 25-1, 25-2, & 25-9, Tables 9-2 & 17-1
	Social	***Educational options***: Awareness raising & integrating into education; Gender equity in education; Extension services; Sharing indigenous, traditional, & local knowledge; Participatory action research & social learning; Knowledge-sharing & learning platforms.	8.3-4, 9.4, 11.7, 12.3, 15.2-4, 22.4, 25.4, 28.4, 29.6, Tables 15-1 & 25-2
		Informational options: Hazard & vulnerability mapping; Early warning & response systems; Systematic monitoring & remote sensing; Climate services; Use of indigenous climate observations; Participatory scenario development; Integrated assessments.	2.4, 5.5, 8.3-4, 9.4, 11.7, 15.2-4, 22.4, 23.5, 24.4, 25.8, 26.6, 26.8, 27.3, 28.2, 28.5, 30.6, Table 25-2, Box 26-3
		Behavioral options: Household preparation & evacuation planning; Migration; Soil & water conservation; Storm drain clearance; Livelihood diversification; Changed cropping, livestock, & aquaculture practices; Reliance on social networks.	5.5, 7.5, 9.4, 12.4, 22.3-4, 23.4, 23.7, 25.7, 26.5, 27.3, 29.6, Table SM24-7, Box 25-5
Transformation	Spheres of change	***Practical***: Social & technical innovations, behavioral shifts, or institutional & managerial changes that produce substantial shifts in outcomes.	8.3, 17.3, 20.5, Box 25-5
		Political: Political, social, cultural, & ecological decisions & actions consistent with reducing vulnerability & risk & supporting adaptation, mitigation, & sustainable development.	14.2-3, 20.5, 25.4, 30.7, Table 14-1
		Personal: Individual & collective assumptions, beliefs, values, & worldviews influencing climate-change responses.	14.2-3, 20.5, 25.4, Table 14-1

Source: IPCC (2014a)

IV. PROJECT'S ALIGNMENT WITH CLIMATE CHANGE ADAPTATION

4.1 The proposed operation contemplates a single component of US$100 million to structure a stable and cost-efficient ex ante financial coverage to cover, in a timely manner, any extraordinary expenditures that could arise in emergencies caused by severe or catastrophic natural disasters. This section shows that the operation meets the three steps of the MDBs' joint methodology and explains the rationale for classifying it as one that contributes to climate adaptation.

4.2 **Step 1: Context of Vulnerability to Climate Change.** Both the Proposal for Operation Development and this technical annex (sections I and II) have identified and assessed the country's vulnerability to climate change and natural hazards.

4.3 **Step 2: Statement of Purpose.** The stated objective of the operation BH-O0003 is to alleviate the impact that a severe or catastrophic natural disaster could have on the country's public finances, by increasing the availability, stability, and efficiency of contingent financing to address emergencies. Also, the operation seeks to enhance the comprehensive disaster risk management of the country by fostering improvements in five main areas through the CDRMP: (i) disaster risk management; (ii) risk identification; (iii) risk reduction; (iv) preparation for emergency and response; and (iv) financial protection and risk transfer. During the loan disbursement period (five years), the IDB will carry out periodic monitoring of progress made in executing the CDRMP to assess, based on the progress indicators agreed upon with the Government of The Bahamas, whether execution is proceeding satisfactory.

4.4 **Step 3: Clear and Direct Link between Climate Vulnerability and Project.** The IDB's contingent loan provides rapid and cost-efficient funds to the Government of The Bahamas in the event of a severe natural disaster, which by itself contributes to climate adaptation by increasing resilience to natural disasters (section III explains the general rationale). But unlike traditional contingent credit, the operation also conditions the availability of resources to the satisfactory execution of the CDRMP. In other words, it provides strong incentives to the country to take preventive actions to reduce disaster risks. Through the loan the country is committed to achieve significant progress in five key areas of DRM, which will help increase its resilience to climate change and natural disasters. The OECD-DAC's handbook for tracking adaptation finance qualifies the three-step adaptation finance tracking approach of the MDBs as a best practice.[25]

4.5 The MDBs' joint methodology follows the criteria of incremental cost, meaning that it requires adaption activities to be disaggregated from non-adaptation activities. Because all resources provided by the operation and made available to the country (US$100 million) are intended to strengthen resilience and mitigate the financial and socioeconomic impact of national disasters, we suggest that the entire loan be considered as adaptation finance and seen as one integrated activity.

[25] See OECD DAC Rio Markers for Climate: Handbook. Page 4.

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