



## Disaster Risk Management - Building a Safe and Resilient Future for All

### SYNOPSIS

The World Bank has emerged as a leading partner of disaster-prone countries in their efforts to manage the risk of disasters, and respond to their impacts when they hit. Investments are helping to safeguard growth in sectors like urban, water, transport, agriculture and rural development, and protect millions from the loss of lives and livelihoods in disasters. To leverage new investment, generate knowledge and expertise and build a global partnership for Disaster Risk Management (DRM), the Global Facility for Disaster Reduction and Recovery (GFDRR) was established in 2006. As a World Bank-hosted facility, GFDRR provides grant financing and offers a range of analytical and advisory services that are directly impacting on the ability of high-risk, low income countries to understand and act on the hazards they face, helping them adapt to a changing climate.

### Challenge

**Disasters caused more than 3.3 million deaths and US\$2.3 trillion in damage (in 2008 US dollars) between 1970 and 2010<sup>1</sup>.** Looking to the future, as the 2010 World Bank / United Nations (UN) report Natural Hazards, UnNatural Disasters: the Economics of Effective Prevention found, large cities already exposed to cyclones and earthquakes will more than double their population by 2050 (from 680 million in 2000 to 1.5 billion in 2050). This trend will differ by country and region. If cities are well managed, disaster impacts need not increase, but the projected increase in numbers of people living at risk in cities highlights the challenge ahead. Furthermore, the report finds that economic development and population growth are expected to result in increasing damages from extreme events and that, without policy change, these costs are expected to triple to US\$185 billion annually by the turn of the century. This scenario is without taking into account any change in the climate.

**Climate change further complicates the picture.** Climate-change induced tropical cyclones could add between US\$28 billion and US\$68 billion to annual damages by 2100. There is great uncertainty with these long-range forecasts, which are sensitive to assumptions about the future, but the fact remains: to achieve lasting social and economic resilience to disasters requires a fundamental step change in how planners and policy makers from all sectors consider disaster risks in the everyday business of development.

**Natural disasters affect low- and middle-income countries disproportionately.** Natural Hazards, UnNatural Disasters (2010) reports that, of the disaster-related deaths reported during the period 1970 to 2010, poor countries withstand the worst, while middle-income countries incurred the greatest proportional economic burden of damage (as a proportion of gross domestic product (GDP)).

<sup>1</sup> Source: World Bank (2010) *Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention*.

## Approach

DRM was universally endorsed as a development priority through the Hyogo Framework for Action (HFA) in 2005. This framework is a compact of 168 governments and international organizations, including the World Bank and the UN, focused on building resilience to disasters for all nations. The HFA has three strategic goals: to integrate DRM in development policies, strategies and planning; to strengthen institutions responsible for DRM at all levels, and; to build a culture of disaster resilience in response and recovery operations.

In line with these goals, the World Bank is responding to the growing demand from its clients for assistance after natural disasters and support to prepare for future disasters and reduce risks, including those resulting from climate change. This response is based on the knowledge that - if done right - preventative measures not only save lives, they are cost effective too. The establishment of GFDRR has leveraged the Bank's role, leadership, and performance on global knowledge creation, innovation and partnerships in DRM. Currently, the World Bank's DRM practice operates across five strategic pillars of action:

- **Post-Disaster Needs Assessment (PDNA) and Emergency Reconstruction & Recovery Projects:** large-scale emergency recovery programs such as those after the Aceh tsunami in Indonesia, the 2005 earthquake in Pakistan and the Wenchuan earthquake in China in 2008; 26 PDNAs to date, supported by rapid mapping and damage validation through remote sensing and earth observation, such as the assessment conducted in Haiti in 2010. Sector-specific knowledge products and toolkits improve the way lessons are captured from disasters, increasing the chances of building a more resilient future for all.
- **Disaster risk mitigation and related climate adaptation investment programs and multi-sector mainstreaming of DRM:** risk mitigation programs, including those focusing on climate-related hazards, such as the India

National Cyclone Mitigation Project; multi-sector investment programs that address disaster risk as a core component.

- **Innovation and application of new technologies:** innovative risk financing instruments such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the Pan-African Drought Insurance Pool; remote sensing and geospatial analysis for mapping risks, analyzing intervention options and assessing post-disaster impacts; leveraging public-private partnerships and volunteer technology communities to identify innovative practical solutions to DRM challenges.
- **Global knowledge solutions and building access to data:** actively informing the global disaster risk management and climate change adaptation agenda with cutting-edge knowledge products, such as the *Housing Reconstruction Handbook*, the seminal study on the economics of prevention *Natural Hazards, UnNatural Disasters* (see Box 1), the *Climate Change, Disaster Risk, and the Urban Poor* report launched at the C40 Large Cities Climate Summit, and the upcoming *Urban Risk Assessment* report. Catalyzing global knowledge sharing through high-level events such as the Understanding Risk Conference or the 2011 World Reconstruction Conference. Promotion of open data and open source technology through the Open Data for Resilience Initiative (OpenDRI); supporting in-country capacity to source, create, open and share data.
- **Partnership development and donor coordination:** through the GFDRR, building strategic and operational alliances with technical and political leaders in the DRM field (see 'Partners' section).

## Results

The growing strategic commitment of the World Bank to DRM is reflected in the number of Country Assistance and Partnership Strategies (CASs/CPSs) that now build disaster risk into their approach. As of July 2011, out of 90 CASs/CPSs reviewed in the last two years, 65

**Box 1: Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention**

The GFDRR was tasked with producing the first joint World Bank – United Nations report on the economics of disaster prevention. The goal was to provide the necessary economic evidence to justify investments in disaster risk reduction, shifting the focus from relief, recovery and reconstruction to prevention and preparedness. In November 2010, the report Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention - the culmination of original research done by over 70 experts from over two-dozen institutions - was launched. The report has been presented in a series of high-level events around the world, shaping and catalyzing policy dialogue at the highest levels, and contributing to making disaster risk reduction a development issue. The team responded to requests from very different audiences, including academic institutions and think tanks, international organizations, and directly from governments, of both developing and developed countries, confirming that preventing death and destruction from disasters is everybody's business.

recognized disasters as a challenge to the implementation of the strategy, 45 identified DRM as a cross-cutting strategic issue, and 15 established DRM as a distinct pillar of their strategy. This strategic recognition of DRM within World Bank strategies is leading to major investment in disaster and climate resilient development, with real results on the ground, including these examples that follow.

**Through innovative instruments and investment, IDA assistance has provided critical support for countries exposed to adverse natural events.** For example, the world's first regional disaster financing facility, the Caribbean Catastrophe Risk Insurance Facility (CCRIF)—which includes IDA countries among its members—was established in 2007 to provide access to short-term liquidity for Caribbean governments in the aftermath of disasters. In addition to technical assistance in the establishment of the facility, the World Bank financed the cost of joining the facility for a number of Caribbean Community (CARICOM) countries, including **Haiti**, and contributed to the Multi-Donor Trust Fund, which served as the initial supporting capital for the facility. Within two weeks of the 2010 Haiti

earthquake, CCRIF transferred US\$8 million to provide immediate liquidity to the government.

Following the 2005 earthquake in **Pakistan**, the World Bank (IDA/IBRD) committed about US\$1 billion to recovery and reconstruction efforts. Achievements include the provision of timely shelter support to 550,000 people and the reconstruction of more than 400,000 earthquake-resistant houses.

**PDNA is increasingly an internationally accepted standard for government-led needs assessment.** In Haiti after the 2010 earthquake, the assessment served as a blueprint for international cooperation in the reconstruction effort, drastically reducing the coordination burden on the strained resources of the Haitian Government. To date over 2,300 officials have been trained in PDNA and damage and loss assessment methodology, increasing the capacity of national authorities to plan and prepare themselves, thus reducing reliance on international assistance. The PDNA has catalyzed major reform in the way at-risk countries manage and plan financing for reconstruction and recovery. National disaster funds have been established in Yemen, Madagascar and Indonesia as a result of World Bank assistance.

**In middle-income economies, IBRD loans have enabled high-risk countries to assess and manage disaster risks comprehensively.** In 2005, the Bank supported **Colombia** with a US\$260 million loan to strengthen the capability of the national disaster risk management system in about 1,000 municipalities. The second phase of this program started in 2006 with an additional US\$80 million loan to support the city of Bogota to strengthen its capacity to manage disaster risks and reduce vulnerability in key sectors. Results of this project include the resettlement of 5,000 households living in high-risk areas to permanent housing in safe areas; retrofitting of 201 schools and kindergartens to seismic-resistant standards between 2005 and 2008; and the reduction of the population at risk in public buildings from 575,000 to 252,000.

**IBRD loans have also assisted in the sustainable and disaster-resilient recovery of disaster-affected communities.** The World Bank

Some of the key highlights of results achieved in IDA supported projects aforementioned above are as follows:

**Sri Lanka:** A significant share of the IDA support from the Tsunami Emergency Reconstruction Program I and II, with US\$75 million each, helped to restore livelihoods of nearly 100,000 families and to reconstruct about 44,000 damaged houses. More than 100,000 Sri Lankan families benefited from livelihood cash grants, with the first installment paid within three months of the tsunami.

**Ethiopia:** 7.8 million rural inhabitants received support under the IDA Productive Safety Net Adaptable Program Loan (APL) II Program through workfare or grants in response to localized intermediate or severe drought 2007-09

**Bangladesh:** 1.7 million households have been supported through the construction of approximately 50 new shelters and repairs to another 250 existing multi-purpose shelters, and rehabilitation of over 100 kilometers of embankments after Cyclone Sidr in 2007

**Togo:** Over 52,000 people in poor neighborhoods were protected against the 2010 floods through the Emergency Urban Infrastructure Rehabilitation Project. The project cleared over 70 kilometers of storm drains in flood risk areas, which allowed rainwater to flow where previously it would flood, rehabilitated roads, provided a 1,000-bed emergency center and connected underserved communities to the electricity network

**Vietnam:** Over 210,000 people living across 30 villages are now prepared for disaster, having developed local early warning and evacuation systems, disaster action plans, 12 new or upgraded storm shelters and 165 safe schools and health care facilities that had been damaged by recent storms

is supporting **China** with a US\$710 million IBRD loan to restore infrastructure, health and education services in several counties and municipalities in Sichuan and Gansu that were damaged or destroyed after the 2008 Wenchuan earthquake. Although the project runs to 2014, construction of 26 hospitals and clinics in Sichuan is already underway. In Gansu, three wastewater treatment facilities, two wastewater pipelines and one water supply pipeline are under construction. Six schools are being constructed and will be open before the next school year begins, while one damaged high school, Hui

County High, was re-opened in March 2011. The construction of all new buildings is subject to high seismic and flood risk standards and experts are supervising every step to ensure lives are not lost in the future. In addition, the GFDRR is supporting the Ministry of Finance to conduct a review of the National Master Plan for Rehabilitation and Reconstruction and six sector recovery plans.

**The Catastrophe Risk Deferred Draw-down Option (CAT DDO)** is an **IBRD innovation** that allows countries to access liquidity immediately after a disaster. Since the start of CAT-DDO operations in March 2008, Colombia, Guatemala and Costa Rica have drawn down funds from the instrument, in payouts of US\$150 million, US\$85 million and US\$24 million respectively. These payouts have provided fast, flexible funds to governments to enable them to respond quickly to the needs of their affected citizens, and to reduce dependence on donor aid and borrowing.

## Bank Contribution

Between fiscal years 2006 and 2011, **IBRD and IDA committed an estimated \$10.5 billion to projects or project elements related to disasters<sup>2</sup>**. Typically, in the urban, water, agriculture or rural development sectors, these operations have built-in DRM as a core component of their design and together they represent 'DRM mainstreaming' in action. New IDA investment has been triggered by the large-scale disasters the world has witnessed in recent times. Furthermore, emergency recovery loans financed by both IDA and IBRD have been approved to restore public services and infrastructure in the wake of recent disasters.

## Partners

In the disaster-prone countries, the World Bank often plays a role in coordinating donor efforts both in ex-ante investment and ex-post assistance for reconstruction and recovery. The World Bank develops partnership through technical and financial assistance to national governmental

<sup>2</sup> Source: GFDRR Disasters Portfolio Database (data as of June 30, 2011)

and non-governmental agencies tasked with the challenge of protecting their country from the threat of disasters.

**The GFDRR** is a partnership financing mechanism co-chaired and hosted by the World Bank that aims to mainstream disaster risk management into development policy and programs, before and after a disaster. The partnership includes 38 country governments from developed, emerging and developing countries and seven international organizations, including the United Nations International Strategy for Disaster Reduction (UNISDR), the Secretariat of the African, Caribbean and Pacific Group of States (ACP), the European Commission, the United Nations Development Programme (UNDP), the Arab Academy for Science, Technology and Maritime Transport, and the International Federation of Red Cross and Red Crescent (IFRC).

**Recognizing the need for partnership and synergy in the post-disaster context, the World Bank, the United Nations and the European Commission entered into a Joint Declaration on Post-Crises Assessments and Recovery Planning in 2008 to improve the coordination of support offered to governments affected by disasters.** This declaration promotes a harmonized approach to the PDNA, in which a multi-disciplinary team—led by the government and comprising members from World Bank, UN, donors and others—typically guides post-disaster recovery strategy in partnership.

**Increasingly, partnership is taking on new and innovative forms, including through ‘volunteer technical communities.** These expert communities—who are most often technical professionals with deep expertise in geographic information systems, database management, social media, and/or online campaigns—apply their skills to some of the hardest elements of the disaster risk management process, like mapping risk and identifying mitigation options. The GFDRR Labs hosts the Random Hacks of Kindness (RHoK), a public-private-people partnership, which includes the World Bank, Google, Microsoft, Yahoo! National Aeronautics and Space Administration (NASA), and Hewlett-Packard (HP). RHoK brings

together 150 government, private sector and civil society partners supporting the initiative at a local level around the globe.

## Moving Forward

Building on success, the World Bank as a global institution commits to provide timely, cutting-edge DRM knowledge and expertise to partner countries, and to continue to mainstream DRM across all sectors of investment. Through targeted support, at-risk countries themselves will be the driving force for real results. Risks cut across national boundaries, and the World Bank will continue to support south-south exchange of officials and technical leaders in the field to facilitate the flow of knowledge and learning.

Through the GFDRR partnership, outreach to a more diverse set of DRM partners is ongoing and must increase, including with the private sector, regional organizations and civil society. The World Bank supports the opening up of risk and climate data and the development of decision support systems so that responsible officials, policy makers and practitioners no longer need to operate in the dark, and can have access to innovation in emerging fields like disaster risk financing, to meet the growing challenges they face. The culture of innovation in the field must continue, particularly on instruments for risk finance.

**IDA has stepped up its support to manage disasters and disaster risks, both ex-ante and ex-post.** The Crisis Response Window (CRW) has been institutionalized in IDA16 to assist low-income countries to respond better to disasters and adopt preventive measures to minimize the adverse consequences of future catastrophes. This funding window is a major step forward and provides greater availability and predictability of additional concessional assistance for post-disaster recovery and reconstruction in low-capacity, high-risk countries. IDA and IBRD will increase support for innovative and customized financial solutions for both low- and middle-income countries that build fiscal and economic resilience to natural hazards.

## Beneficiaries

Counting DRM in lives saved

*"I still remember Cyclone Sidr in 2007," said **Hasina Begum**, Headmistress of Paschim Napitkhali Primary School in Barguna, Bangladesh. "There were warnings, but nothing could really prepare us for what happened. Cyclone Sidr hit my hometown, Barguna with ferocious intensity. Powerful gusts of winds and heavy rainfalls frightened the helpless people, many of whom had left their homes and possessions to seek the protection of cyclone-shelters, like my school."* The Paschim Napitkhali Primary School, a non-descript two storied building played a life-saving role in 2007, when Barguna and other coastal regions were hit hard by the storm surge of over 5 meters (16 ft). Initially established by Hasina's father, the school was later rebuilt and converted into a school-cum-cyclone-shelter.

During the year, the primary school bustles with children – but during cyclones and other natural disasters, the building doubles up as a shelter. In 2007, this cyclone-shelter alone had helped save more than 800 people.

With the effects of climate change likely to increase the frequency and severity of natural disasters, Bangladesh needs to adapt to increased uncertainty and be prepared. With this in mind, around 700 cyclone shelters are in the process of being constructed or upgraded with better designs with support from the World Bank to protect the country's coastal population. Approximately 480 kilometers of embankment are also being repaired and reconstructed through the same initiative. Hasina's school-cum-cyclone-shelter received funds to repair portions of the wall and the ceiling, which was badly damaged in the 2007 cyclone.

## LEARN MORE

### Web Sites

- GFDRR website: <http://www.gfdrr.org/gfdrr/>