THE WORLD BANK

Disaster Risk Management

BUILDING A SAFE AND RESILIENT FUTURE FOR ALL

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SUSTAINABLE DEVELOPMENT NETWORK

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Contents

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BUILDING A SAFE AND RESILIENT FUTURE FOR ALL

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.[1] 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)).

1. 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:

1. **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.

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.

2. **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.
3. **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.
4. **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.
5. **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 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 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.[2] 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.

Some of the key highlights of results achieved in IDA-supported aforementioned projects 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.

2. Source: GFDRR Disasters Portfolio Database (data as of June 30, 2011).

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 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.

Djibouti Disaster Risk Management

Challenge

Through the World Bank-managed Global Facility for Disaster Reduction and Recovery (GFDRR), Djibouti is addressing the need to strengthen its capacity to assess and communicate its risks and vulnerabilities to natural hazards.

GFDRR Disaster Risk Management (DRM) program was designed with Djibouti's institutional capacity in mind, so as to foster ownership of this program among national agencies that had leading roles in all stages of implementation. This approach has resulted in high transfer of disaster risk management capacity, and has provided the Djibouti partners with good levels of ownership and confidence, which will be instrumental for the sustainability of risk assessment capacity. The work carried out through GFDRR funding since 2008 has generated useful knowledge that the government of Djibouti is applying in its effort to upgrade the country's disaster risk management capacity.

Approach

The GFDRR funded activities have enabled a strong partnership among key development partners working on disaster risk management in Djibouti. Quarterly trainings and round-tables with the SEGRC, the Ministry of Environment, the National Meteorology Agency, the University of Djibouti and the Djibouti Center for Research Studies (CERD), the Ministry of Health, and international donors such as the United Nations Development Program (UNDP), UNISDR the World Food Program and, the European Union, the Inter-Governmental Authority for Development (IGAD) are creating stronger synergy among the programs, while enabling the organization of a multi-donor DRM round-table planned for the end of 2011 in Djibouti. Coordinated support is expected to increase the momentum of sector investment while promoting the integration of disaster risk reduction measures in country development strategies, as demonstrated by the recent integration of DRM into the 2011 Djibouti development strategy, the National Initiative for Social Development (INDS).

Results

The Natural Disaster Risk Assessment and Monitoring System technical assistance—focused on developing a comprehensive and sustainable arrangement to assess, communicate and monitor hazard risks in Djibouti—is helping the country to shift from a responsive to a preventive approach to natural disasters and has helped reach the following outcomes:

- 30 national practitioners were trained and certified in disaster risk management and reduction by the GFDRR (September 13–16, 2010);
- 35 students from the University of Djibouti (20 of which are enrolled in GFDRR-funded academic DRM program) were trained by the Bank on Climate Change Adaptation (CCA) (December 4–5, 2010);
- Disaster data collection and management capacity increased following technical training of 40 stakeholders from line ministries (February 20–23, 2011);
- The CERD established a damage and loss inventory database, allowing the government to systematize and quantify damage and losses after a natural disaster (February 2011);
- Two university students joined a Masters Degree program in disaster risk management in France, financed by the Djiboutian Government. Those students will join the SEGRC in August 2011.

Bank Contribution

Through the GFDRR, the World Bank has helped transfer knowledge and build DRM and CCA capacity of local institutions, while increasing the involvement in DRM of the Health Ministry and Ministry of Planning, which are now working on a

sectoral DRM strategy. The Bank has mobilized resources to support the following activities: (i) Natural Disaster Risk Assessment and Monitoring System (GFDRR US$2.5 million); and; (ii) Pursuing Low Regret Climate Adaptation and Disaster Risk Reduction Options (US$200,000 from the TFEESD)

Toward the Future

The strong disaster risk management efforts of the University of Djibouti and the National Meteorology Agency triggered additional financing (US$200,000) from the Trust Fund for Environmentally and Socially Sustainable Development (TFEESD), to pursue "Low Regret Climate Adaptation and Disaster Risk Reduction Options in the Republic of Djibouti." These activities greatly complement ongoing efforts under GFDRR, and respond to the strong request from national stakeholders to strengthen national capacities for analysis and communication of disaster risk and climate change information among vulnerable communities.

The GFDRR-funded activity has triggered the establishment of a Laboratory for Risk Management by CERD. This initiative, funded by the Djiboutian government, demonstrates a strong commitment to provide integrated scientific and technical approach to risk management.

The University of Djibouti has also created training courses in disaster risk management and climate change adaptation that have been integrated into the university curriculum. There are currently 26 students enrolled in this course.

As a result of the 2011 drought in Djibouti, the Government of Djibouti requested and obtained GFDRR support to perform a DALA training followed by a drought Post Disaster Needs Assessment (PDNA).

30 national practitioners were trained and certified in disaster risk management and reduction.

Pakistan Earthquake Housing Reconstruction and Livelihood Programs

Challenge

After the 2005 Pakistan earthquake, the immediate requirement was to provide earthquake-affected people with a basic shelter to protect against the harsh winter that was already setting in. The next set of challenges involved classifying the level of destruction of each housing unit against uniform technical criteria; identifying eligible beneficiaries for the Rural Housing Reconstruction Program (RHRP); providing them with a range of seismically resistant and culturally acceptable structural design options; developing corresponding and equitable grant packages; quickly disbursing the first and second grant tranches to almost 600,000 beneficiaries spread over 30,000 sq.km of rugged mountainous terrain; and finally, establishing multi-stakeholder implementation and coordination mechanisms down to the grass root level.

Approach

The RHRP has remained a flagship earthquake recovery program of the Government of Pakistan implemented through the Earthquake Reconstruction and Rehabilitation Authority (ERRA) and home-owners themselves. Both the pace and quality of implementation under the RHRP has been remarkably impressive—especially when compared with similar homeowner-driven housing reconstruction programs elsewhere in the region and internationally, which in most cases have met with only partial and belated success. Additionally, state of the art Monitoring and Evaluation, and Management Information System-based grievance monitoring and redressal systems were developed by various implementation partners under the program.

Results

A vast majority of people residing in the earthquake-affected areas show commitment towards promoting and practicing a culture of seismic resistant housing construction.

Highlights

One the key achievements of the RHRP has been effective and efficient reconstruction of hundreds of thousands of homes across multiple dimensions:

- scale—30,000 sq.km, more than 500,000 houses;
- time—85% progress in three years;
- quality—seismic compliance rates of over 90%;
- community capacity building—more than 500,000 individuals have been trained or oriented in seismic resistant housing construction and;
- diversity of solutions implemented—owner selection from a menu of seismic structural solutions

Bank Contribution

The RHRP has been financially and technically supported by the World Bank through its Emergency Recovery Project (ERP) and the additional financing of the Pakistan Poverty Alleviation Fund. Together, the World Bank funding for the Program comes to US$ 448m –close to a third of the estimated Program cost of US$ 1.5 billion.

The ERP—which in addition to housing also included a livelihoods support component, entailing monthly livelihood support grants to eligible and the most deserving affected families all across the affected region - was satisfactorily completed in December 2006. Between April to December 2006, around 260,000 families received monthly cash support of Rs.3000 for a period of six months, and totaling around Rs.4.5 billion (US$ 75 million) in

disbursements. Following the overwhelming success of the component it was then extended to the most vulnerable families for a period of six months, for another 22,500 families, with additional disbursements totaling Rs.375 million.

Toward the Future

Notwithstanding the successful and earlier than anticipated completion of the RHRP, further efforts and informed interventions are still required, not only to bring the Program to a befitting closure, but also to ensure that the successes under the program are consolidated and are sustainable. There is an opportunity for sustaining, deepening, and extending the project developmental impact beyond the Program duration and its beneficiaries, to fully stimulate a culture of seismic resistant construction in all sectors across the high risk prone affected areas Azad Jammu and Kashmir (AJK) and North West Frontier Province (NWFP). Such sustainability can partly be achieved by absorbing the capacities developed under the RHRP into sustainable institutional structures. Currently these are dispersed among Housing Reconstruction Centers (HRCs) located across the affected districts and the District administrations. If these could be brought together under institutional arrangements for disaster risk management for the country, they could continue to function beyond the program period, and benefit communities in construction of houses as well as other buildings through provision of training, technical assistance, and advice.

More than 500,000 individuals have been trained or oriented in seismic resistant housing construction.

Vietnam: Managing Natural Disasters—From Ex-post Response to Ex-ante Preparedness and Mitigation

Challenge

In Vietnam, population growth and changing demographic and economic patterns have led to uncontrolled urbanization together with widespread poverty. More than 70 percent of the population is estimated to be exposed to multiple natural hazards. The country has been identified as one of the five countries worst affected by climate change (World Bank 2007). Over the past decade, natural disasters have resulted in the loss of over 3,000 lives and annual damage equivalent to an average 1%-1.5% of GDP. It is estimated that, on average, about 40% of the central contingency budget and 20% of the local contingency budget are available to finance post-disaster recovery activities.[1]

Approach

The ongoing US$86 million Natural Disaster Risk Management Project (NDRMP) funded by IDA is the only financial support provided to the country and is the main source of Bank support for disaster risk management efforts. The Project supports both structural and non structural measures to enhance the government's capacity to managing disaster risks. Structural measures include strengthening key infrastructure used to mitigate disaster impacts, such as dyke systems, safe harbours for fishing boats, and pumping stations. Other measures included institutional and capacity building support, and financing post-disaster reconstruction investments. The project was expanded through US$75 million additional financing from IDA in 2010 to further support Vietnam with post-disaster reconstruction efforts. The assistance is not only helping Vietnam in handling its financing gap for post-disaster reconstruction, but also helping Vietnam in better managing budgetary resources for post-disaster management.

Results

Even though the project has not yet completed its investment activities, most critical investments in physical infrastructure and institutional and capacity building have been effective during recent typhoon and storm seasons. The Central Committee for Flood and Storm Control (CCFSC) and its branches have used their enhanced capacity to help vulnerable communities in 17 provinces of the Central Region and Cuu Long River Delta.[2] In addition, the Government is increasing the efficiency of its post-disaster recovery and reconstruction efforts, including in the allocation and disbursement of post-disaster resources and in the use of the State Contingency Budget to support post-disaster reconstruction of public infrastructure.

Highlights

As of March 2011:

- 17 provinces have developed a comprehensive provincial action plan for the implementation of the National Strategy, which has been integrated into the 5-year socio-economic development plan (SEDP).
- The functions, responsibilities and coordination mechanism of the Central Committee for Flood and Storm Control and its branches in 63 provinces have been established through Decree #14 issued in February 2010.
- More than 210,000 villagers living in 30 communes have benefited directly from the community-based disaster risk management (CBDRM) model, including Commune Safe Plans, community early warning and evacuation systems, and community-scale mitigation measures developed by the project.

1. Weathering the storm: Options for Disaster Risk Financing in Vietnam, June 2010, GFDRR, The World Bank
2. Vietnamese name of the Mekong river section located in Vietnam

- IDA funded construction or significant upgrading of 12 large-scale disaster-mitigation structures and 165 public services infrastructures damaged by storms Xangsane and Lekima. It also funded 305 small-scale public infrastructures damaged by typhoon Ketsana.
- Central Committee for Flood and Storm Control developed and implemented a comprehensive training package on DRM for government officials at the national and sub-national levels.

Bank Contribution

IDA provided support for disaster prevention and mitigation measures, by offering Vietnam opportunities to mobilize not only additional resources but also international expertise in support the Government's long-term disaster management strategy. Specifically, IDA support has enabled massive NGO's involvement in disaster risk management initiatives undertaken by vulnerable communities and has enhanced their leadership capacity.

In addition, IDA has helped the government carry out substantial institutional reforms as Vietnam moves to a comprehensive and integrated approach to disaster risk management encompassing development planning, disaster preparedness, forecasting, prevention, mitigation, post-disaster recovery and reconstruction.

Toward the Future

As a follow up to the NDRMP program, IDA is continuing to support the Government of Vietnam in its ongoing disaster risk management program via a US$150 million Managing Natural Hazards project currently under preparation. The project will focus on 10 provinces in the hazard-prone Central Region and will use a river basin approach to guide priority structural and non-structural investments at different levels. Hydro-met services and early warning systems will also be upgraded and strengthened through this new follow-on project.

More than 210,000 villagers living in 30 communes have benefited directly from the community-based disaster risk management model.

Yemen: Safeguarding Residents and Businesses of Taiz From Seasonal Floods and Disease

Challenge

Taiz, a city of about 600,000 inhabitants, is located at the foot of the giant Saber Mountains. Before the project and due to lack of proper drainage systems, rain waters would flood private and public properties, leaving behind enormous amount of debris and dusts that would take weeks to clean and remove. In addition, each year these rains would leave behind tens of deaths and hundreds of destroyed homes, businesses, and public infrastructure. The challenge was to build flood control channels that would give the people of Taiz the opportunity to live normal lives all the year around.

Approach

The only solutions to Taiz's floods were investing in flood control structures, or relocating the people. The latter solution was not practical and too expensive and, hence, the first option was selected. Preparation of the first phase began in 1988, and in 1991 the project was approved by the World Bank Board for an amount of US$16 million. Major investments in this phase were directed to the most vulnerable areas of the city, but mainly downtown Taiz where most people live and work. Investments on flood control structures in upstream and downstream were left for later phases. After completion of the first two phases by June 2008 Taiz is finally recovering from years of destructive seasonal floods.

Results

Successive IDA financing of US$16 million, US$45 million, and US$20 provided vital flood control structures in the city of Taiz and its surrounding areas. By the closing of the second phase in June 2008, major parts of Taiz city, including downtown Taiz, were transformed into livable and flash flood-secure neighborhoods and the impact of the projects on the lives and livelihoods of the people in these areas is substantial.

Highlights:

- The structures built under the successive phases include: Ten kilometers of open channel; 21km of covered channel; 85km of stone and asphalt paved roads; 54km of sewer line; 21 sedimentation traps; and 3.2km of above-street-level retaining walls.
- The number of deaths per year reduced from an average of six people per year to zero.
- An increase in land values by more than 100 percent; a reduction in damages to residential properties and businesses from 160 and 660 respectively per year to zero; a reduction in the yearly maintenance costs of public services such telephone, power, water and sewer networks and roads.
- Flood structure and complementary wastewater connections helped to improve health and sanitary conditions by reducing the flow of wastewater into wadis, which had become breeding grounds for malaria-infested mosquitoes.

- The 85km stone and asphalt paved roads constructed under the project helped to improve the flow of traffic within the city and reduced congestion.
- Due to its labor extensive nature, the project has created directly and indirectly 45,000 man-month of employment jobs for skilled and unskilled workers during implementation.

Bank Contribution

Total IDA support to the city of Taiz under the flood protection project is US$ 81 million, which includes US$10 million under the Taiz Pilot Emergency Water Supply Project and US$40 million through the Urban Water Supply and Sanitation Project. The total cost of the three phases, including government's contribution, is about US$97 million, provided between 1991 and 2010 to finance a number of activities, including civil works representing 83 percent of the total project cost. After securing Taiz from destructive seasonal flooding, the Board approved in May 2010 and additional IDA support to Taiz to help upgrade a number of informal settlements at a total cost of US$ 22 million.

Partners

This is an emergency or disaster risk reduction type of project. There has not been much donor interest or capacity to support this project. IDA remains the only donor partner for this project through its three successive phases.

Damages to residences and businesses came down to zero from about 160 and 660 respectively, while deaths in the targeted areas declined from an average six persons a year to three in 2005 and zero since beginning of 2006.

Yemen

Toward the Future

The results of the project are tangible and people recollect how their lives changed before and after the IDA effort got underway. The achievements made were not only recognized by those living in Taiz but also by those who know people before the initiative. If there is a project that all people have the same voice about it, it is the Taiz Municipal Development and Flood Protection Project

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